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# INDEX TO VOL. LXX.

[For Index to Illustrations see page VI.]

- ABBEYS:** Selby, 836; Tewkesbury, 60, 186  
 Abernethy, Jas., the late, 400  
 Abnormal and vitiated atmospheres, 112  
 About: by laws, 578; boardings, 260  
 Abuse and use of auctions, 450  
 Abuses of advertising, society for checking, 226  
 Academy, royal: architecture, 116, 626, 664, 842; exhibition, 275; old masters at, 51; pictures at, 625, 662, 697; present position of architecture at, 629  
 Academies: Cambrian, 186, 807; Scottish, 115, 298, 331 (architecture at) 399  
 Accidents, damages for, 440  
 Acoustic reflector, Calcutta senate house, 586  
 Action of: fire on fire-resisting materials, 125; light on water colours, 50  
 Acts, factory, 553, 740, 852, 922  
 Advertisers, exasperating, 193  
 Advertisements, permissible, 655  
 Advertising, society for checking abuses of, 226  
 Advisers, arbitrators, and taskmasters, 263  
 Affiliation, provincial of architects, 773  
 Aitchison, G., and R.I.B.A. presidency, 595  
 Albert institute, Dundee, underpinning of, 477  
 Albi cathedral, 803  
 Alleged misrepresentation as to partnership, 547  
 Almshouses, Trinity, Mile End-road, 807  
 Alphabets, a manual of lettering, 782  
 Alterations to old buildings in London, 559  
 Amalgamated society, carpenters and joiners, 622  
 America, Portland cement in, 955  
 Ancient lights: 189; estimation of, 195; lawyers litigate on, 225; railway stations and, 333, 402  
 Anderson v. Muggeridge, 691, 694, 730  
 Anglo-Normans in Ulster, the, 890  
 Angoulême cathedral, 803  
 Annealing cast iron by shocks, 555  
 Annoyance, covenants against, 654  
 Apothecaries' hall, 201  
 Appeals: Metropolitan management act, 260, 402; successful, against magistrates' decision, 152  
 Applications, rival, 810  
 Apportionments, paving, and parks, 879  
 Appraisements and valuations, 380  
 Arbitrations: Bournemouth, 878; Central London, 333, 547; Chester and Birkenhead, railway widening, 731; Green-st., Leicester-sq., 475; Harrogate, 547; Leeds, 308, 440; Poets-corner, 298, 475; Thirlmere, 225, 768; Tower subway, 367; Upper Thames-st., 731  
 Arbitrators, advisers and taskmasters, 263  
 Architect-builder-decorator, 156  
 Architects: action (between) 879 (by a Plymouth) 954; and craftsmen, 479; and quantities, 653, 840; and surveyors' societies (Bradford) 220 (Sheffield) 110, 259, 400, 562, 916; assistants, national union of, 952; benevolent society, 399, 476; British (proposed national union of) 79 (royal institute of) 126, 197, 226, 368, 411, 485, 594, 739, 850, 950 (do. finances) 653, 666, 730 (do. presidency) 595 (do. prize drawings) 83, 91; call, at Clayworkers' Institute, 667; certificates not enforceable, 691, 694, 730; charges, 917; critics, 772; diary, 78; experience at Tenerife, 80; fees, 190, 440 (are they conditional) 444 (for party wall) 152, 188; French congress of, 927; Glasgow institute of, 916; liabilities, 694; partnership at Bexhill, 621; provincial affiliation of, 773; quantities, 692, 730; registration, 442, 451 (in Ontario) 586; secretaire, club designs, 387, 401; sent to prison, 50, 152, 260, 367, 368; society, the, 125, 267, 409, 591, 737 (provincial conferences) 442, 451 (Cardiff and S. Wales do.) 259 (Manchester do.) 60, 653; statutory registration, conferences at Cardiff and Bristol, 451; use of colour, 594; why they neglect colour, 735  
 Architectural: associations (Birmingham) 294 (Edinburgh) 127, 294, 438, 562, 653, 729, 950 (Glasgow) 60, 127, 220, 294, 364, 524, 729, 836 (London) 86, 160, 220, 305, 374, 444, 629, 699 (dinner) 837 (soirée) 734 (visits) 231, 417; Northern, 766, 836, 916; drawings exhibition, Manchester, 549; education in London, 509; museum, royal, 811; progress, 2; societies (Devon and Exeter) 364, 438, 950 (Edinburgh) 110, 167, 332, 784 (Leeds and Yorkshire) 332, 474 (Liverpool) 690 (York) 167, 508; training, 267  
 Architecture: academy, 116, 626, 664, 842; at royal Scottish academy, 399; at the Salons, 773; civil and municipal, 117; common sense in, 82; domestic, in Washington, 851; ecclesiastical, Scotland, 486; high art applied to, 150; history of, 545; improvement in, 845; of the Teutonic order, 444; present position of, at academy, 629; street, 916  
 Arc lamp, Jandus, 344  
 Ardsley, sewerage of, 841  
 Are architects' fees conditional? 444  
 Armitage, E., R.A., the late, 804  
 Art: club, new English, 517; for schools association, 842; galleries (British) 231 (Reading) 381 (South London) 417, 525; high, applied to architecture, 150; in brickwork, 3; Scottish and English, 81; Spanish, at New Gallery, 90  
 Artesian wells in Queensland, 153  
 Artist, the plastic, needs no festival, 661  
 Artists: benevolent institution, 368; British, royal society of, 481  
 Arts: fine, society of, 110; home, 513, 546, 853  
 Ashworth, E., Exeter, the late, 418  
 Assembly rooms and concert halls, 56, 83, 123, 162, 337, 415, 448, 560, 703, 742, 811, 848, 886, 928  
 Assessment, street paving, 621  
 Assign, covenants not to, 620  
 Assistants, architects', national union of, 952  
 Associations: architectural, 86, 160, 290, 305, 374, 444, 629, 699 (dinner) 837 (soirée) 734 (Birmingham) 294 (Edinburgh) 127, 294, 438, 562, 653, 729, 950 (Glasgow) 60, 127, 220, 294, 364, 524, 729, 836 (northern) 766, 836, 916; art for schools, 842; building trades (Manchester) 400; clerks of works', 220; district surveyors', 955; home arts and industries, 513, 546, 853; house painters, national, 153; master builders (Dublin) 294 (Exeter) 364 (National) 222, 259 (Preston) 562 (Sheffield) 657; metropolitan public gardens, 261; municipal engineers, 836; slate merchants, national, 695; waterworks engineers, 583  
 Assurance buildings, Johannesburg, 784  
 Asylums, lunatic: Beverley (East Riding) 201; Cotford (Somerset) 512; county, 7, 119, 228, 302, 413, 517, 555, 705; Hawkhead, N.B. (Govan) 220; Purdysburn, Belfast, 839  
 Athens, the Kynosarges, 476  
 Atmospheres, abnormal and vitiated, 112  
 Attempt to enforce prospective by-laws, 189, 224  
 Atwood, C. B., Chicago, the late, 59  
 Auctioneers: institute, 842; institutes, rival, 878; provincial, position of, 303  
 Auctions, use and abuse of, 450  
 Australasia, timbers of, 163, 221, 233, 482, 557, 703, 779, 847, 888, 930  
**BAECKELMANS, F. C., Antwerp,** the late, 223  
 Bakery, 546  
 Balustrades, staircase, 275  
 Band-stand, Grissell design, 275, 345  
 Banking premises: Gateshead (Savings) 438; Glasgow (Savings) 167; Leeds (Williams) 857; Liverpool (Adelphi) 45; Madras, 653; small branch, club designs, 816  
 Banks's fireproof construction, 191, 481  
 Baroda, palace, 739  
 Barre, Auguste, the late, 258  
 Bars of York, 525  
 Baths: Bilston, 78; Burslem, 186; Coventry, 126; Holbeck, Leeds, 876; Kingston-on-Thames, 161, 364; Lincoln, 681, 877; Nottingham, 950; private, notes on, 668; Shoreditch, 91, 113, 126, 149, 167; small public (club designs) 159; Walsall, 836  
 Beadell v. Daw, breach of warranty, 368  
 Belgian shutterwork, 489  
 Beneficial occupation, 953  
 Benevolent: institutions (artists) 368 (builders' clerks) 308, 473; society, architects', 399, 476  
 Bethnal-green museum, furniture at, 80, 931  
 Billing, Arthur, the late, 583  
 Birmingham: architectural association, 294; city surveyorship, 477, 622; railway improvements, 804; upholsterers' conference, 549, 586  
 Bitumen damp-course, Callender's, 257  
 Black lists of workmen, 655, 694, 731  
 Blackpool great wheel, 583  
 Blackwall tunnel, 148, 408  
 Blessings in disguise, 371  
 Blown-glass bricks, 116  
 Blunder, a contemplated, 577  
 Board schools: Ambler, Thorn, 489; Bristol, 46, 489, 576; Dagenham, 857; Darent, 167; Eastleigh, 652; Golear, 754; Gorton, 652; Halifax, 309; Hanley, 950; Leeds, 552; Littleborough, 225; Llanrwst, 931; Needham Market, 552; North Shields, 769; Penarth, 453; Sheffield, 690; Sunderland, 294; Swindon, 745; Willesden (Dudding-hill) 381  
 Boards, flooring, 953  
 Boeswillwald, E., Paris, the late, 473  
 Boiler: explosions, kitchen, 153, 299, 549; tall-tale, 166  
 Bolting to rock, 620  
 Bond, brick, 619  
 Bookbinding, English, 190  
 Booth v. Chapman, singular contract, 475  
 Bostock, Jas., Northwich, the late, 113  
 Boston, a peculiar church plan, 298  
 Bourne, H., Penarth, the late, 258  
 Bournemouth arbitration, a, 878  
 Bradford society of architects and surveyors, 220  
 Branch lines, railway bridges for, 836  
 Brick bond, 619  
 Brickmaking: bricks and, 409; near Peterborough, 507  
 Bricks: 474; and brickmaking, 409; blown-g ass, 116  
 Brickwork: and timber framing, 693; art in, 3; piers, strength of, 692, 731; tests for, 485  
 Bridge: pins, steel, 892; timbers, strength of, 47  
 Bridges: Edinburgh (North) 504; Queensferry, 544; railway, for branch lines, 836; Snodland, 128; steel, designing of, 53, 164, 340, 522, 702, 776  
 Bridlington sea wall, 955  
 Bristol: cathedral, 695; conference on architects' registration, 451; floods, prevention, 728, 879; shelter competition, 805  
 British: architects (national union of) 79; (royal institute) 126, 197, 411, 485, 594, 739, 851, 890 (finances) 653, 666, 730 (club medal) 197, 226, 368, 950 (presidency) 595 (prize drawings) 83, 91; art gallery, Millbank, 231; artists, royal society of, 481; museum (lion railings) 115  
 Brown, A. Page, San Francisco, the late, 296  
 Buchan, W. P., Glasgow, the late, 328  
 Builder: and his mortgage, 260; and sub-contractors, 694; -decorator-architect, 156  
 Builders: clerks' benevolent institution, 308, 473; clerks' institute, 366, 418, 853; conviction affirmed, 298; master, associations (Dublin) 294 (Exeter) 364 (National) 222, 259 (Preston) 562 (Sheffield) 657  
 Building: Act, London (and greenhouses) 116 (and London county council) 585 (appeal) 878 (cases) 333, 367, 409 (lifts and 367 (notice forms) 365 (not retrospective) 732 (section 212) 225 (workhouse adjuncts) 403; by-laws (Cambridge) 225 (demolition under) 50 (Leeds) 261, 807, 880 (not retrospective) 655; contracts, L.C.C., 223, 656; contracts, conditions of, 271, 341, 553; is a tent a, 475; line appeal, 260, 402, 512; methods of, 227; News designing club, 159, 270, 337, 382, 559, 667, 816; over vaults, 189, 368; plots, title on, 879; societies, 886; trade, mistakes in the, 221; trades exhibition (Agricultural Hall) 224 (Manchester) 299, 477, 598, 657; trades (federation, Scottish) 695 (strike, London) 658, 696, 734, 769, 808, 846, 881; up-to-date, 335  
 Buildings: copyright in photographs of, 441; exempted, 119; federal, in United States, 549; fireproof, 155; heavy, foundations of, 744; municipal, 86, 150; old, in London, alterations to, 559; raw and ripe, 480; utilitarian, 516; warming, by hot water, 888, 924  
 Bull, Stanhope, the late, 157, 442, 586  
 Burner, gas, Williams and Dean's, 191  
 Burnett, T. H., in re, 731  
 Burning questions, some, 883  
 Burns memorial, Mauchline, 839  
 Business premises: Aberdeen, 876; Birmingham, 438; Buenos Ayres, 201; Conduit-street, W., 60; Coventry, 836; Duke-st., Grosvenor-sq., 563; Farringdon-avenue, E.C., 275; Ipswich, 365; Liverpool (Royal insurance) 256, 633; Ludgate-hill, 912; St. Paul's churchyard (Pawsons and Leafs) 417; South Shields, 257; Swansea, 563  
 By-laws, building: about, 878; as to new streets, 655; at Cambridge, 225; attempt to enforce prospective, 189, 224; demolition under, 50; Leeds, 261, 807, 880; not retrospective, 655; vestry, 224  
**CAIRO,** Old, destructive restoration at, 4  
 Calcutta senate house, acoustic experiments at, 586  
 Callender's bitumen damp-course, 257  
 Cambrian academy, royal, 186, 807  
 Camp, Roman, at North Marden, 442  
 Canal, Chicago drainage, 225  
 Canaries, clay in the, 80, 259  
 Canny Scot, the, 953  
 Canterbury cathedral restoration, 129, 294, 836, 955  
 Can the contract system last? 227  
 Cardiff: and South Wales architects' society, 259; architects' registration conference, 451; exhibition, 549; Tredegar estate, 769  
 Carlisle, Tullie house museum, 190  
 Carpenter convicted, a, 225  
 Carpenters: and joiners amalgamated society, 622; company (and technical education) 80 (examinations) 769, 892 (lectures) 622; hall, 60  
 Carpet lining, wood pulp, 513  
 Carrara marble industry, 955  
 Carving, wood, 197  
 Cases, London Building Act, 409  
 Casey, Geo. T. L., the late, 583  
 Casket, Seely presentation, 46  
 Cast iron: annealed by shocks, 955; columns, 337; in builders' work, 5, 77, 122, 199, 232, 390, 415, 449, 510, 520, 596, 765, 777, 838, 850, 913, 951  
 Castle, Mar, N.B., 802  
 Cates, Arthur, resignation of, 404  
 Cathedrals: Albi and Angoulême, 803; Belfast, 110, 582; Bristol, 401, 695; Canterbury, 129, 294, 836, 955; Cologne, 129; Ely (Lly chapel sculptures) 55, 115; Geneva, 411; Hereford (library) 294; Lincoln, 345; Peterborough (present condition of) 737 (Society of Architects at) 880; St. Alban's, 419; St. Paul's (decoration of) 333, 544, 586; Salisbury, 186, 328; Winchester, 807, 855 (oak v. chestnut at) 955; Worcester, 237; York, 369  
 Cause of decay and damp in masonry, 766  
 Caution to architects, 440, 952  
 Cedar, white, for shingles, 956  
 Celestial institute, from A.A. standpoint, 743  
 Cement: ill effects on stonework, 80; makers v. builder, 806; Portland, in America, 955; Slag, German, 561; tests, water in, 153  
 Cemetery, Northampton, 651  
 Central London railway: 50, 690, 856, 955; stations, 333, 547, 655, 694, 841  
 Certificate: architect's not enforceable, 691, 694, 730; sanitary institute, 512  
 Champ de Mars salon: 628; architecture at, 773  
 Champs Elysées salon: 605, 837; architecture at, 773  
 Chapels: Ashton-under-Lyne (Meth. New Con.) 188; Bacup (U. Free Meth.) 364; Cheetham-hill (Wesln.) 618; Denstone college, 110; Ely cathedral (Lyd., sculptures) 55, 115; Felixstowe (Wesln.) 912; Ile St. Honorat, 931; Middleton, Leeds (Wesln.) 508; Newcastle-on-Tyne (Wesln.) 453; Nottingham (Meth. Free) 833; Outlane, Huddersfield (Meth. New Con.) 600; Rolls (demolition of) 115; Stafford (Bapt.) 850; Wolstanton (Wesln.) 525  
 Charges: architect's, 917; paving, and the L.C.C., 80, 115  
 Cheap: on the, 114; preservative for timber, 191  
 Cheapside cross, 188  
 Chelsea: Embankment (court) 447 (extension) 918; Water Co.'s bill, 732  
 Cheltenham Kursaal, 584  
 Cheshire county surveyorship, 442, 586  
 Chestnut or oak at Winchester, 955  
 Chicago: exhibition medals, 695; main drainage canal, 226; tall buildings, 769  
 Chlorine as a sewage disinfectant, 257  
 "Christian at Vandy Fair," 45  
 Church: house, the, 252; Jabez, the late, 473; planning, at Batton, odd, 298; screens, Devonshire, 591  
 Churches: Banbury (St. Mary) 509; Barham (rod screen) 731, 879; Barton-under-Needwood (St. James) 876; Beith, N.B., 857; Boldmere (St. Michael) 294; Boothby Pagnell, 576; Burton (St. Paul) 45; Callington (St. Mary) 618; Castle Acre, 419; Chediston, 49; Chesterfield (All Sts.) 345; City, 54, 519 (St. Bartholomew-the-Great) 807 (St. Mary Woolnoth) 145, 764; Clifton, 876; Colchester (St. Peter) 148; Davies-st., W. (St. Anselm) 270; domed, of Perigord and La Charente, 269; Edgton, 912; Exeter (St. David) 256, 266, 364; Frizinghall (St. Margaret) 294, 526; Garway (St. Michael) 802; Gorgie (Free) 802; Grinton, 592; Hampton - in - Arden, 709; Heaton (Episcopn) 933 (Presbntn.) 836; Holbeck (St. Francis R.C.) 294; Hope-under-Dinmore (St. Mary) 259; Ipswich (St. Bartholomew) 49 (Trinity) 78; Ivinghoe 652; Kea, 912; King's Heath (Wesln.) 950; Kirkley, 856; large town, 60; Little Leighs (St. John Evan.) 110; London (City) 54 (of the 17th and 18th centuries) 519; Lundy Isle (St. Helena) 802; Meavy (St. Peter) 950; Morecambe (St. Barnabas) 857; Newcastle-on-Tyne (Knox Presbntn.) 544 (Trinity Presbntn.) 309, 802 (W. Clayton-st. Congl.) 297, 328; New York (St. Mary Virgin) 774; Olton (St. Margaret) 401; Perigieux (St. Front) 269; Richmond, Surrey (Free) 618; Roehampton (H. Trinity) 618; St. Alban's (St. Michael) 728, 807; St. Anne's-on-Sea (St. Thomas) 857; Scarborough Cliff, 633; screens in Devonshire, 586, 591, 654; Selby (abbey) 836; Shelton, 148; South Shore, Blackpool, 328; Staunton (St.



- Mary) 489; steel frame construction for 774; Stratford-on-Avon (Trinity) 656; Swanage (Congl.) 419; Swanscombe (All SS.) 45; Tewkesbury (Abbey) 60; Tick-hill, 582; Todmorden (St. Mary) 764; town (club designs) 270 (R.A. do.) 129; Toxteth (Congl.) 802; Troon (parish) 49; Trunch, 419; Wandsworth (St. Anne) 931; West Ham, E. (St. Matthew) 802; Westham, Weymouth (St. Paul) 220; Whitfield (St. James) 364, 611; Wirksworth (font) 588; Wolverton (St. George) 582
- Cisterns, flushing, 596  
Citadel, Salv. Army, Bristol, 912  
City : and Guilds institute, 622, 807; and Waterloo railway, 148, 257; churches, London, 54, 519; guilds, 60, 201, 381, 563, 893; improvements, a year's, 442; parliamentary projects, 261; population of United States, 404  
Civil : and municipal architecture, 117; engineers, institution of, 856; service estimates, 442  
Claims and applications, rival, 810  
Clare-market improvement scheme, 441, 476  
Clark : D. Kinnear, the late, 187; W. H., Bristol, the late, 729  
Clarke, Jas., Rawtenstall, the late, 839  
Classic details and their application, 4, 88, 121, 157  
Clay in the Canaries, 80, 259  
Clayworkers' institute, architects' call at, 667  
Cleaning drain, trap for, 854  
Cleansing and flushing of drains, 343  
Cleared sites and vacant plots, 336  
Clerkenwell polytechnic, 380  
Clerke, W. J. Bird, C.I.E., the late, 298  
Clerks : builders' (benevolent institution) 308, 473 (institute) 366, 418, 853; of works association, 220  
Client, man-of-straw, 50, 152  
Cliff protection, Sheringham, 129  
Closets, Doulton's valve, 729  
Club : BUILDING NEWS designing, 159, 270, 337, 382, 559, 667, 816  
Clubhouses : Barnoldswick (Conserv.) 691; Edinburgh (Union) 950; Lytham (golf) 381  
Clutton, John, of Whitehall, the late, 364  
Coefficients, Kendrick's, 116  
Collar-beam, graphic determination of stresses in, 56, 222, 231  
Colleges : Cambridge (Presb'tn.) 526, 692; Denstone (chapel) 110; Glasgow (technical) 562  
Colour, architects' : neglect of, 735; use of, 594  
Coloured concrete, 440  
Columns, cast iron 337  
Common sense : in architecture, 82; v. custom, 697  
Competition plans, asylum, 555  
Competitions : asylums, lunatic (Croydon) 526 (Purysburn, Belfast) 839; banks (Madras) 653; baths and free library (Shoreditch) 91, 113, 126, 149, 167; baths (Kingston-on-Thames) 161, 364 (Lincoln) 691, 877; board schools (Littleborough) 223 (Penarth) 453; bridge (Snodland) 128; BUILDING NEWS designing club, 159, 270, 337, 382, 559, 667, 816; cemetery buildings (Northampton) 691; chapels (Ashton-under-Lyne, Meth. New Con.) 188 (Bicup, Uni. Free Meth.) 364; churches (Exeter, St. David) 256, 296, 364 (Newcastle-on-Tyne, Congl.) 297, 328 (South Shore, Baptist) 328; city hall (New York) 299, 364; clubhouse (Lytham, golf) 381; club (Barnoldswick, Conserv.) 691; college (Cambridge, Presb'tn.) 526, 692; co-operative premises (Leigh) 46; decoration (Philadelpia council chamber) 952; hall (Edzell, Inglis meml.) 508; hospitals (Bedford, 767 (Christchurch, fever) 114, 328 (Liverpool, Northern) 46, 619; hotel (Weymouth) 223; industrial hygiene, 952; infirmary (Ingham) 877; insurance premises (Liverpool) 256, 633; Kursaal (Cheltenham) 584; lodging-house (Leith Corporation) 526; memorial (Burns, Mauchline) 839; municipal buildings (Cleethorpes) 381; museum (Liverpool extension) 767; nurses' home (Bradford) 296; parish rooms (Cockermouth, All SS.) 328; R.I.B.A. and Soane drawings, 83, 91; Royal Academy (town church) 129; schools (Camelford, Smith's) 223 (Eccles, parish) 223 (Llandrindod Wells, intermediate) 730 (Llandysul do.) 877 (Llangollen do.) 506 (Lowestoft, technical) 767 (Shaw) 730 (Staleybridge, Bapt.) 223 (Walspool, intermediate) 256; sewerage and water supply (Linslade) 260; shelter (Bristol, St. Augustine's) 905; shops (Wimbleton) 223; statue (Inverness) 526; Stock, 128; surveyors' institution premises, 439, 584; town hall (Belfast) 905; travelling studentship, A.A., 690; waiting-room (Bristol tramway) 691; workhouse infirmary (Shardlow) 619  
Concert halls and assembly rooms, 66, 83, 123, 162, 337, 415, 448, 560, 705, 742, 811, 848, 886, 928  
Concrete : coloured, 440; construction, 272, 304  
Coney, W. F., in re, 731  
Conditional, are architect's fees? 444  
Conditions of building contracts, 271, 341, 563  
Conductors, lightning, 383, 767, 953  
Coney, W. F., in re, 811  
Conferences : plumbers (Nottingham) 733; provincial, society of architects' (registration) 442, 451; upholsterers (Birmingham) 549, 583  
Congress of French architects, 927  
Conservancy, river, 632  
Construction : Banks's fireproof, 191, 481; concrete, 272, 304; factory, 553, 740, 852, 922; steel (frame, for churches) 774; steel (pipe) 892 (spires and steeples) 926  
Constructing a covenant, 805  
Contemplated blunder, a, 877  
Continent, old masters on the, 90, 167, 419, 489, 671, 817  
Contract : a singular, sequel to, 475; building, L.C.C., 223; system, can it last, 227; v. municipal pipe-laying, 808  
Contractors, plans prepared by, 153  
Contracts, building : conditions of, 271, 341, 553; one-sided, 302; quantities and, 589, 693, 771, 805  
Convents : Genoa (S. Silvestro) 45; Liberton, N.B., 764  
Conway water supply, 807  
Co-operative premises : Brighthouse, 817; Failsworth, 931; Leigh, 46; Motherwell, 599  
Copper, capabilities of, 160  
Copyright in photographs of monuments and buildings, 441  
Cork : municipal buildings, 402, 547, 586; supply, 549  
Corners : and crooked plots, 920; frontage lines at, 621  
Cornwall, Passmore Edwards institutions in, 631  
Corporations and manorial rights in subsoil, 732  
Cost, counting the, 372  
Costs in nuisance abatement, 579  
Cottage hospitals : 342; Ormskirk, 186; Tilbury, 912  
Cottages : and country buildings, 782; gamekeepers' club designs, 382  
Cotton exchange, Liverpool, 78  
Counting the cost, 372  
County : council buildings, Durham, 309, 652; councils and footpaths, 655; lunatic asylums, 7, 119, 228, 302, 413, 517, 555, 705; surveyorship, Cheshire, 442, 586  
Covenant, construing a, 805  
Covenants : against annoyance, 654; not to assign, 620; restrictive, 225, 841  
Covers, manhole, 484  
Cowlin, W. H., Bristol, the late, 364  
Cow-shed and stables, club designs, 667  
Crabtree, Wm., Southport, the late, 328  
Craftsmen and architects, 479  
Cramming, professional, 403  
Cranbourne street property, 918  
"Crib," the, 443  
Crisp, Henry, of Bristol, the late, 8, 5  
Critics, architects', 772  
Crooked plots and corners, 920  
Crosses : Cheapside, 188; Ealing, 309; East Brent churchyard, 154; Harborton, 365  
Croydon, Warrington lunatic asylum, 526  
Cubitt v. Dicker, architects' fees, 152  
Custom v. common sense, 697  
Cutlers' Co. hall, 351  
Cutting, Amos P., the late, 323  
Cyprus, excavations in, 404
- DAFFODILS** begin to peer, 515  
Damages : for accidents, 440; for personal injuries, 367  
Damp : and decay in masonry, 766; course, Callender's bitumen, 257  
Danesdale, Driffild, British barrows at, 50  
Dangerous structures, 190  
Darington, building progress at, 652  
Deals, Swedish, 474  
Decay and damp in masonry, cause of, 766  
Decoration : of Philadelpia council chamber, 952; of St. Paul's, 333, 544, 589; the stencil in, 305  
Decorative furniture, 489  
Decorator-builder-architect, 156  
Defective drains as causes of disease, 153  
Deficit at the R.I.B.A., 653  
Demolition under building by-laws, 50  
Designing : club, BUILDING NEWS, 159, 270, 337, 382, 559, 667, 816; of steel bridges, 53, 164, 340, 522, 702, 776  
Designs : BUILDING NEWS club, 159, 270, 337, 382, 559, 667, 816; disappointing, 194; preliminary, remuneration for, 921; Rhead's poster, 955; Soane and R.I.B.A., 83  
Details, Classic, application of, 4, 88, 121, 157  
Determination, graphic, of stresses in collar-beam, 56, 222, 231  
Devon : and Exeter architectural society, 364, 438, 950; road screens, 586, 591, 651  
Diary, architect's, 78  
Digest of physics, tests, 258, 782  
Dilapidations : 732; ecclesiastical, 621  
Dinners : archi. association, 837; builders' clerks' benevolent, 473; clerks' of works association, 220; surveyors' institution, 438  
Disadvantages of large asylums, 413  
Disappointing designs, 194  
Disclaimers, L. Blomfield's, 546  
Disease, defective drains as causes of, 153  
Disguise, blessings in, 371  
Disinfecting sewage by chlorine, 257  
Disposal of refuse and sanitation, 274  
Disputes : as to plans, 918; as to rights of way, 198  
District surveyors' association, 955  
Docks : Barry, 188; Keyham, Devonport, 856; Surrey, extension, 365, 856  
Dockyard, Pembroke, 476  
Domestic purchases of Perigord and La Charente, 269  
Domes and how to carry them, 335  
Domestic : architecture, Washington, 851; drainage, 917, 952 (notes on) 196, 234, 288, 329, 343, 370, 412, 450, 484, 523, 556, 596, 668, 708, 739, 780, 814, 849  
Door fastener, new, 295  
Doulton's valve closets, 729  
Drainage, domestic : 917, 952; notes on, 196, 234, 268, 329, 343, 379, 412, 450, 484, 523, 556, 596, 668, 708, 739, 780, 814, 849  
Drain-cleaning trap, 854  
Drains : defective, as causes of disease, 153; or sewers, old, 917; varying local regulations as to, 126  
Drawing in elementary schools, 258  
Drawings, R.I.B.A. and Soane, 83, 91  
Dress, the history of, 733  
Dronefield sewage disposal, 226  
Drury v. Army and Navy Stores (party wall) 732, 737  
Dublin master builders' association, 294  
Dudley gallery exhibitions, 230, 846  
Dundee, underpinning the Albert institute, 477  
Duty, house, 152  
Dwellings, working men's, bill, 369
- EARTH** movements, unfelt, 586  
Earthwork tables, handy, 782  
East London water supply, 260, 298  
Ecclesiastical : architecture of Scotland, 486; art exhibition, 808; dilapidations, 621  
Ecclesiological society, St. Paul's, 167  
Economical houses, 187  
Edinburgh : architectural (association) 127, 294, 438, 562, 653, 729, 950 (society) 110, 167, 332, 784; notes from, 48, 929; picturesque notes, 519; plumbers' meeting, 733; property market, 116; Scott monument completion, 190; Talla water supply, 880; university, McEwan hall, 341; Waverley station improvements, 186  
Edmunds, C. J., in re, 878  
Education : architectural, in London, 509; technical board, exhibition, 447  
Edwards : D., Barnet-green, in re, 954; J. C., Raubon, the late, 488, 524  
Electrical engineer' price-book, 619  
Electric lighting and power-distribution, 782  
Elementary schools, drawing in, 258  
Ely cathedral, Lady chapel, 55, 115  
Embankment, Chelsea, extension, 918  
Engineers : draughtsmen's work, 858; municipal, association, 836; note-book, sewerage, 781; waterworks, association, 583; yearbook, 619  
Engineering and physical experiment, 669  
English : and Scottish art, 81; art club, new, 517; bookbinding, 190; Renaissance, 4  
Entrances to new streets, 693  
Epsom water supply, 621  
Essex house school of handicraft, 190  
Estimates, civil service, 442  
Estimating of ancient lights, 195  
Europe, illustrated, 782  
Examinations, Carpenters' Co., 769, 892  
Exasperating advertisers, 193  
Excavations : at Silchester, 513, 657, 808; in Cyprus, 404  
Exchange, cotton (Liverpool) 78  
Exempted buildings, 119  
Exeter : builders' association, 364; St. David's church competition, 256, 296, 364  
Exhibitions : Bethnal-green museum (furniture) 80, 93; bricks (Clayworkers' institute) 667; building trades (Agricultural hall) 224 (Manchester) 299, 477, 598, 657; Cardiff, 549; Dudley gallery, 230, 846; ecclesiastical art (Shrewsbury) 808; Glasgow fine arts institute, 226; Guildhall art gallery (water colours) 691; home arts (Albert hall) 853; Manchester (architectural drawings) 549, 598; National Portrait Gallery, 509; New English art club, 517; New Gallery (pictures) 627 (Spanish art) 80; royal Academy, 275 (architecture) 626, 664 (old masters) 51 (pictures) 625, 662, 697; royal Cambrian Academy, 807; royal Institute Water Colour Painters, 373, 885; royal School of Art Needlework, 838; royal Scottish Academy, 298, 331 (architecture at) 399; royal society British artists, 481; salons (architecture at) 773 (Champ de Mars) 628 (Champs Elysees) 665, 837; technical education boards, 447; Whitechapel fine art, 513  
Exits from factories, 740  
Experiences, architects', at Tenerife, 80  
Experimental, the, and the practical, 661  
Experiment, physical, and engineering, 669  
Explosions, kitchen boiler, 153, 299, 549  
Export duty on pulpwood, 955  
External and party walls, 737, 768
- FABRICS** : Aldam Heaton on, 699, 769; stencilled, 927  
Factory : construction and factory acts, 553, 740, 852, 922; South Wigston (boot) 690  
Failures, a year's, 50  
Falcon-court, S.E., improvement of, 656  
Falconnier's blown-glass bricks, 116  
Family home, Glasgow, 438  
Faster, new door, 295  
Fawcett v. Homan and Rodgers, fireproof flooring patent, 655  
Fees, architect's : 190, 440; are they conditional? 444; for party wall, 152, 188  
Festival, plastic artist needs no, 661  
Finances, R.I.B.A., 653, 666, 730  
Fine arts society, 110  
Finish for oak, 297, 332, 366, 401  
Fiorelli, of Pompei, the late, 223  
Fire : action of, on fire-resisting materials, 125; brigade station, Blackfriars, E.C., 472  
Fireproof : buildings, 155; construction, Banks's, 191, 481; flooring patent case, 655; floors, 150  
Fire-resisting materials, action of fire on, 125  
Fitness of an umpire, 547  
Fleet-street widening, 476, 513  
Flooring boards, 933  
Floors, fireproof : 150; patent case, 655  
Flushing : and cleansing of drains, 341; cisterns, 596  
Font at Wirksworth, 586  
Footpaths, county councils and, 655  
Footways, projections over, 605  
Foreign substitutes v. local resources, 261  
Forest preservation in America, 880  
Form of specification, a, 59  
Forms, notice, London Building Act, 365  
Foundations of heavy buildings, 744  
Framing, timber, and brickwork, 693  
Free libraries : Abingdon, 709; Bodmin, 633; Dewsbury, 472; Hammersmith, 381, 453; Liskeard, 257; Newcastle-on-Tyne, 129; Nunhead, 563; St. Helens, 728; St. Ives, 633; Shoreditch, 91, 113, 126, 149, 167, 857; West Ham, 113  
French : architects, congress of, 927; carved woodwork, 803; Renaissance, minor examples of, 925  
Frontage lines at corners, 621  
Fulham vestry v. Solomon, 189, 224  
Furniture : and silks, at Bethnal-green museum, 80, 931; decorative, 489; Goldsmid collection, 931; Norwegian, 419; warehouse, 188
- GALLERIES** : British art (Tate) 231; Dudley, 230; Glasgow corporation, 261; National (additions to) 187, 403; National Portrait, 509, 695, 769; New (pictures) 627 (Spanish art) 80; Reading (art) 381; South London (Leighton meml.) 417, 525; Truro, 690  
Gamekeeper's cottage, club designs, 382  
Garden in relation to the house, 226  
Gardens, metropolitan public, association, 261  
Gas : burner, Williams and Dean's, 191; companies' liabilities, 585  
Geneva cathedral restoration, 411  
Geological survey map, cheaper, 115  
George, Ernest, royal gold medallist, 197, 226, 368  
Germany, slag-cement manufacture in, 561  
Getting one's own way, 551  
Girders and joists, steel, 295  
Glasgow : architectural assocn., 60, 127, 220, 294, 364, 524, 729, 836; builders and the improvement trust, 566; corporation gallery, 261; district subway, 365; fine art exhibition, 226; institute of architects, 916; museums, 226; philosophical society, 220; technical college, 562; water supply, 912  
Glazing, Rendle's invincible, 261  
Gold medal, royal, 197, 225, 368, 950  
Graphic determination of stresses in collar-beam, 56, 222, 231  
Greenhouses, and the Building Act, 116  
Green wood, moisture in, 842, 880  
Griffin's electrical engineers' price-book, 619  
Grocers' Co. hall, 563  
Ground plan of London, 403  
Guardians' offices : Rochdale, 544; Widegate-street, E.C., 472  
Guildhall art gallery, water colours at, 591  
Guilds, City : institute, 622; 60, 201, 381, 563, 893  
Guillane, N.B., water supply, 548  
Gullies, surface, 523  
Guinness trust, the, 513
- HACKFORD**, Geo., the late, 473  
Hackney, vestry work in, 80  
Halicarnassus, the Mausoleum at, 298  
Halifax, building progress in, 876  
Halls : Apothecaries' Co., 201; Carpenters' Co., 60; Clapham (St. Anne's) 69; concert, and assembly rooms, 56, 83, 123, 162, 337, 415, 448, 560, 705, 742, 811, 848, 886, 928; Cutlers' Co., 381; Edinburgh (Univ., McEwan) 341; Edzell (Inglis meml.) 508; Grocers' Co., 563; Knowsley (village) 876; Maer, Whitmore, 745; Newcastle-on-Tyne (Miners') 129; Prince's, Piccadilly, 309; Skinners' Co., 893  
Hanley, ten years' public works in, 914  
Handicraft school, Essex house, E., 190  
Handicrafts in Suffolk-street, 195  
Handy general ether tables, 782  
Hardwoods : for paving, 930; New South Wales, 221, 235, 482; Queensland, 557, 703; South Australia, 779; Tasmania, 888; Victoria, 704, 779; Western Australia, 847  
Harrigate arbitration, 547  
Health, public, Scotland, bill, 476  
Heaps, waste, 150  
Heated wrought iron, strength of, 298  
Heating and ventilation, 127  
Heavy buildings, foundations of, 744  
Hicks, Jas., of Redruth, the late, 59  
High art applied to architecture, 150  
Historical aspect of portrait painting, 261  
History of : architecture, B. Fletcher's, 545; dress, 733  
Hoardings, about, 260  
Holborn-Strand improvement, 399, 407, 877  
Home arts and industries association, 513, 546, 853  
Homes : cripples' (Gosforth) 912; family (Glasgow) 438; nurses' (Bradford) 296 (London hospital) 481  
Horsham, Christ's hospital school, 110  
Horton, W., Manchester, the late, 59



Hospitals: Bedford, 767; Christ church (fever) 114, 328; cottage, 342; Liverpool (Northern) 66, 619; Newton Abbot, 576; Ormskirk (cottage) 186; St. Mark's (Hstola) 632; Sunderland, 802; University college, 671; Tilbury (cottage) 912; Watford (fever) 508  
Hotels: Aldgate (Three Nuns) 695; Birmingham (Hen and Chickens) 728; Edzell (Panmure Arms) 783; Embankment (Ceol) 599; Westminster Bridge-road (Dover Castle) 745; Weymouth, 233  
Hot water: supply, public, 954; warming buildings by, 888, 914, 924  
House: duty again, 152; garden in relation to the, 226; painters, national association of, 153; the Church, 259  
Housemaids' slop-sinks, 708  
Houses: Blackheath, 745; Boston, Mass., 883; Brighton, 201; Brooklands, 745; Cefn Coed, Cardiff, 489; Chelsea Embankment-court, 447; Clapham (St. Anne) 60; Colwyn Bay, 237, 419; economical, 187; Fiamborough, 309; Frensham, 817; Glenroy, Finchley, 419; Hallams, the, Chilworth, 45; Hampstead, 817; Helensburgh, 167; Hurstmere, Hind Head, 111; inflammable, 295; Kenilworth (bungalow) 599; Leighton's, Lord, 656, 695; Mar Castle, 802; Prestwich, 893; pulling down, 694; Rochampton, 201; Rowton, King's Cross, 167; Scarborough (Park lodge) 817; Shockerwick, 709; Shrewsbury (old) 563; Surrey, 867; Sutton Coldfield, 545; Swanage, 817; Thornton, Cheshire, 825; warming, from kitchen fire, 619  
Housing of the: labouring classes, 112; working classes bill, 732  
How to carry domes, 335  
Hoyle, improvements at, 954  
Huddersfield water supply, 548  
Hunt, R. Morris, the late, 112

**ILLUSTRATED** Europe, 782  
Illustrations, cathedral, indexed: Lincoln, 345; Peterborough, 737  
Improvement in architecture, the, 815  
Improvements: a year's City, 442; Clare-market, 441; Poets-corner, 298  
Incandescent light litigation, 954  
Industries, wood, of Sweden, 619  
Infirmary: Ingham, 877; Leeds (general) 508, 728; Pontefract (workhouse) 618; Shardlow (workhouse) 619  
Inflammable houses, 295  
Initial supervision, 881  
Inspection chambers, 412  
Institutes: auctioneers', 842 (rival) 878; British architects', royal, 126, 197, 411, 485, 694, 739, 854, 880 (finances) 653, 696, 730 (gold medal) 197, 226, 368, 950 (pre-destination) 595 (prize drawings) 83, 91; British, of preventive medicine, 447; builders' clerks, 366, 418, 533; a Celestial, from A.A. standpoint, 743; City and Guilds, 622, 807; Clayworkers (bricks at) 667; Dundee (Albert) 477; Glasgow architects, 916; polytechnic (Clerkenwell, Northampton) 380 (Holloway-road, Northern) 110; sanitary (certificate of) 512; technical, 230, 234, 265; water colour painters, 373, 885  
Institutions: artists' benevolent, 368; builders' clerks', 366, 418 (benevolent) 40, 308, 473; civil engineers, 536; Passmore Edwards, in Cornwall, 631; surveyors', 340, 414, 438, 695, 707 (new premises) 439, 584  
Instructor, sheet metal workers', 782  
Insurance premises, Liverpool (Royal) 256, 633  
Invisible glazing, Rendle's, 261  
Iron: and steel, tabulated weights of, 781; cast (annealed by shocks) 955 (columns) 337 (in builders' work) 5, 77, 122, 199, 382, 390, 415, 449, 510, 520, 596, 765, 777, 838, 850, 913, 931; work, paint for, 477; wrought, strength of heated, 298  
Irwell and Mersey, pollution of, 548  
Is a tent a building? 475

**JANDUS** are lamp, 344  
Jarrah dale Jarrah wood, 733  
Johnston, Jas., Orley, the late, 223  
Joints, drain-pipe, 379  
Joists and girders, steel, 295

**KENDRICK'S** coefficients, 116  
Kershaw's pneumatic ventilator, 622  
Keys and locks, asylum, 517  
King-post truss, 693  
Kingston-on-Thames baths, 161, 364  
Kingswood, draught of, 912  
Kirby v. Harrogate school bd., restrictive covenants, 225  
Kitchen: boiler explosions, 153, 299, 549; fire, warming houses from, 619; sinks, 556  
Kursaal for Cheltenham, 584  
Kynosarges at Athens, the, 476

**LABOURERS**, Wilts L.C.C. and their 333  
Labouring classes, housing of the, 112  
Lacey, W. R., in re, 806  
La Charente, domed churches of, 269  
Lady chapel, Ely, sculptures in, 55  
Lambeth Water Co.'s bill, 732  
Lamp, Jandus arc, 344  
Lancashire federation of building trade employees, 892  
Lancaster water supply, 476  
Lavatories, 739

Lawyers litigate on ancient lights, 225  
Laxton's builders' price-book, 187  
Lectures, Carpenters' Co., 622  
Leeds: and Yorkshire archi. socy., 332, 474; arbitrations, 368, 440; building by-laws (appeal) 807 (demolition under 50 (reform) 261, 880; City-square improvement, 622; water supply, 912; York-street insanitary area, 807  
Leek illustrated, 619  
Legal, 50, 80, 115, 152, 189, 224, 260, 298, 329, 367, 402, 410, 475, 511, 547, 620, 654, 695, 731, 768, 805, 811, 878, 917, 953  
Legality of road-section figures, 731, 879  
Leigh, building by-laws at, 917  
Leighton, Lord, the late, 187; house of, 656, 695; memorials, 954 (South London art galleries) 417, 525  
Le Keux, J. H., the late, 223, 296  
Lettering, a manual of, 782  
Levant, wandering scholar in the, 545  
Liabilities: architect's, 694; Gas Co.'s, 585  
Libraries, free: Abingdon, 709; Bodmin, 633; Dewsbury, 472; Hammersmith, 381, 453; Liskeard, 257; Newcastle-on-Tyne, 129; Nunhead, 563; St. Helen's, 728; St. Ives, 633; Shoreditch, 91, 113, 126, 149, 167, 857; West Ham, 113  
Libraries: Hereford cathedral, 294; Manchester (Christie) 671  
Lifts and London Building Act, 367  
Light: action of, on water colours, 50; railways bill, 414  
Lighthouse, Dover, 50  
Lighting, heating, and cooking, 858  
Lightning conductors, 333, 767, 953  
Lights, ancient: 189, estimation of, 195; lawyers litigate on 225; railway stations and, 333, 402  
Lincoln: baths competition, 691; cathedral illustrations, 345  
Lincoln's Inn-fields, 781, 810  
Line building, appeal, 260, 402, 512  
Lines: branch, railway bridges for, 536; frontage, at corners, 621  
Lining, carpet, of wood pulp, 513  
Linslade sewerage and water supply, 260  
Lists, black, of workmen, 655, 694, 731  
Litigation between lawyers on ancient lights, 225  
Liverpool: architectural society, 690; artisans' dwellings for, 918; high level viaduct scheme, 477; model of ancient Rome at, 299; museum, 767; Northern hospital competition, 46, 619  
Local: regulations as to drains, varying, 126; resources v. foreign substitutes, 264  
Loch Lubnaig, soundings in, 657  
Locks and keys, asylum, 517  
Lockwood's builders' price-book, 78  
Locomotion, new, some results of, 809  
Lodging house, Leith corporation, 526  
Lofty steel building, a, 952  
London: architectural education in, 509; Building Act (cases under) 333, 367, 409 (greenhouses and) 116 (lifts and) 367 (notice forms) 365 (not retrospective) 732 (section 212) 225; building trades strike, 658, 696, 734, 769, 808, 843, 881; churches of 17th and 18th centuries, 519; city churches, 54; county council, 148, 488, 733 (and sky signs) 280 (building contracts) 222, 656 (summoned under Building Act) 585 (v. Pryor) 260, 402, 512; ground plans of, 403; insanitation in, 954; old buildings in, alterations to 559; plumbers, 954; riverless, 332, 366; water supplies, 50, 190, 476 (East) 260, 298 (sea) 153 (Welsh) 153, 260, 333, 768; water trust, 411  
Lower Thames: navigation, 588; street, compensation case, 189  
Ludicrous verdict, a, 547, 586  
Lunatic asylums: Beverley (East Riding) 201; Cotford (Somerset) 512; county, 7, 119, 228, 302, 413, 517, 555, 705; Croydon, 526; Hawkhead, N.B. (Govan) 220; Purdysburg, Belfast, 839

**MACADAM**, tarred, 223  
Macarrie v. Gibbon, ancient lights, 225  
Magistrate's decision annulled, 152  
Mahogany, mountain, 191  
Manchester: architectural drawings exhibition, 549; building trades (association) 400 (exhibition) 299, 477, 598, 657; society of architects, 60, 653  
Manholes, 412, 484  
Man-of-straw client, 50, 152  
Manorial rights in sub-soil, corporations and, 732  
Manual of lettering, 782  
Manufacture, slag-cement, in Germany, 561  
Map, cheaper geological survey, 115  
Marble industry at Carrara, 953  
Marden, Sussex, Roman camp at, 442  
Marienburg-on-Nogai, 444  
Market hall, Rothwell, 472  
Markets, Sydney, 111  
Masonry: cause of decay and damp in, 766; Hervey Flint on, 374, 439; measurements, 403  
Mason's non-slipping stair treads, 622  
Master builders' associations: Dublin, 294; Exeter, 364; National, 222, 259; Preston, 562; Sheffield, 657  
Masters, old: at the Academy, 51; at Windsor Castle, 275, 599; on the Continent, 90, 167, 419, 489, 671, 817  
Mausoleum at Halicarnassus, 298  
May morning, 625  
Measurements, masonry, 403  
Medal, royal gold, 197, 226, 368, 950  
Medals, Chicago exhibition, 695  
Medicine, preventive, institute of, 447  
Meeting-room, Edgbaston, 876  
Melos, Greek mosaic from, 842

Memorials: Mauchline, N.B. (Burns) 839; South London art galleries (Leighton) 417  
Mersey and Irwell pollution, 548  
Methods of building, 227  
Metropolis management act appeal, 402  
Metropolitan: public gardens association, 261; sanitation, 515; water supplies, 50, 190, 476 (Welsh) 153, 260, 333, 768  
Middlehurst, J., St. Helen's, the late, 524  
Middleton, J. H., the late, 915  
Midsomer Norton sewerage, 880  
Millbank, Tate art gallery, 231  
Minor examples of French Renaissance, 925  
Misrepresentation as to partnership, 547  
Mission hall, Walworth, 728  
Mistakes in the building trade, 221  
Modern: office building, 545; opera-houses and theatres, 837; Renaissance, 4, 88, 121, 157; stencil, 305  
Moisture in green wood, 842, 880  
Momentum, 260  
Monastery, St. Alban's, 513  
Monuments: copyright in photographs of, 441; Edinburgh (Scott) 190; Philadelphia (Richard Smith) 404  
More questions concerning contracts and quantities, 771  
Morley water supply, 804  
Mortgages in possession, 367  
Mosaic, Venetian, for Vienna, 477  
Mountain mahogany, 191  
Movements, unfelt earth, 586  
Municipal: and civil architecture, 117; buildings, 86, 150 (Cleethorpes) 381 (Cork) 402, 547, 586 (Croydon) 764 (King's Lynn) 783 (Perth) 472; engineers' association, 836; v. contract pipe-laying, 808  
Mural paintings at Pompeii, 695  
Museums: Antwerp (Plantin) 745; Bethnal-green, furniture at, 80, 931; British (iron railing) 115; Glasgow, 226; Liverpool (extension) 767; royal architectural, 811; South Kensington (completion) 879 (jewelry for) 191

**NATIONAL**: associations (house painters) 153 (master builders) 222, 259 (slate merchants) 695; Gallery pictures, additions to, 187, 403; Portrait gallery, 509, 695, 769; union of architects' assistants, 952; union of British architects, proposed, 79  
Naval works, costly, 368  
Navigation, Lower Thames, 586  
Needlework, royal school of art, 858  
New: and old streets, 475; Brighton, great tower for, 955; door fascener, 295; English art club, 517; Gallery (pictures at) 627 (Spanish art at) 80; locomotion, some results of, 809; photography, pulley under, 417; South Wales, hardwoods of, 221, 233, 482; streets (by-laws as to) 655 (entrances to) 693; year, work for the, 1; York city hall, competition, 299, 364  
Newark, N. J., building by-laws at, 808  
Newman, John T., the late, 8  
No festival needed by plastic artist, 661  
Noiseless paving for stables, 654, 693  
Noise, nuisance by, 511  
Non-slipping stair treads, Mason's, 622  
Northampton polytechnic, Clerkenwell, 380  
Northern architectural association, 766, 836, 916  
Norwich main drainage works, 115  
Note-book, sewerage engineer's, 781  
Notes: from Edinburgh, 48, 929; from Paris, 166, 416, 670; on domestic drainage, 196, 234, 258, 329, 343, 379, 412, 450, 484, 523, 556, 596, 668, 708, 739, 780, 814, 819; parliamentary, 369, 441, 476, 512, 621, 685, 732, 879, 912, 950  
Notice forms under London Building Act, 365  
Not: retrospective (building by-laws) 655 (London Building Act) 732; to assign, covenants, 620  
Nottingham: plumbers' conference at, 733; water for rural districts, 48  
Nuisance: abatements, costs in, 879; by noise, 511  
Nurses' home: Bradford, 296; London hospital, 481

**OAK**: finish for, 297, 332, 366, 401; or chestnut at Winchester cathedral, 955  
Obituary: Abernethy, Jas., 400; Armitage, E. R. A., 801; Ashworth, E., Exeter, 418; Atwood, C. B., Chicago, 59; Baechmans, F. C., Antwerp, 223; Baugh, Auguste, 258; Billing, A. C., 563; Boeswillwald, E., Paris, 473; Brock, J., Northwich, 113; Bourne, A., Penarth, 2; Brown, A. Page, 296; Buchanan, W. P., Glasgow, 328; Bull, Stanhope, Chester, 187, 442; Casey, Gen. T. L., 563; Church, Jabez, 473; Clark, D. Kinear, 187; Clark, W. H., Bristol, 729; Clarke, Jas., Rawtenstall, 839; Clerke, W. J., Bird, C.I.E., 296; Clutton, John, Whitehall, 364; Cowlin, W. H., Bristol, 364; Crabtree, W., Southampton, 328; Crisp, Hy., Bristol, 855; Cutting, A. P., 328; Edwards, J. C., Ruabon, 458, 524; Fiorelli, of Pompeii, 223; Hackford, G., 473; Harris, Sir Augustus, 955; Hicks, Jas., Redruth, 59; Horton, W., Manchester, 69; Johnston, J., Otley, 222; Leighton of Stretton, Lord, P.R.A., 187, 954; Le Keux, J. H., 223, 296; Middlehurst, J., St. Helen's, 524; Middleton, J., Henry, 915; Newman, J. T., 8; Raine, Canon, 766; Richardson, C., 258; Richmond, G. R. A., 473; Robertson, G., 258; Shields, J., Carlisle, 8; Stent, E. J., Neville, 729; Stewardson, J., Philadelphia, 187; Vicars, A., 766; Vickery, G.

A., 583; Walker, Gen. J. T., C.B., 296; Wells, Thos., 187; Wilson, J. A., Philadelphia, 258  
Observatory, Blackford-hill, Edinburgh, 472  
Occupation, beneficial, 953  
Office building, modern, 545  
Offices: Bombay (railway) 419; Rochdale (guardians') 544; Widgate-street, E.C. (Jewish guardians') 472  
Old: and new streets, 475; buildings in London, alterations to, 559; Cairo, destructive restorations at, 4; drains or sewers, 917; masters (at the Academy) 51 (at Windsor Castle) 275, 599 (on the Continent) 90, 167, 419, 489, 671, 817  
One-sided contracts, 302  
One's own way, getting, 551  
Ontario, architects' registration in, 586  
On the cheap, 114  
Opera houses and theatres, modern, 837  
Organ, Burton (St. Paul) 45  
Overlapping, 590  
Ownership, riparian, 512

**PAINTERS**: house, national association of, 153; in water colours, institute, 373, 885  
Paint for ironwork, 477  
Painting, portrait, Hoa. J. Collier on, 261  
Paintings, mural, at Pompeii, 695  
Palaces: Baroda, 739; Genoa (Balbi) 45; national elegance, 112  
Panics, theatre, 782  
Pantograph, the, 854  
Paper, Willesden, for roofing, 955  
Parabolic sound reflector, Calcutta, 586  
Paris, notes from, 166, 416, 670  
Parish room, Cockermouth, 328  
Parks, paving apportionments and, 879  
Parliamentary: notes, 369, 441, 476, 512, 621, 685, 732, 879, 912, 950; projects affecting the City, 261  
Parliament-street widening, 476, 732  
Parthenon, the repairs, 403, 513  
Partnership: architects', at Bexhill, 621; misrepresentation as to, 547  
Party wall: and external wall, 737, 768; architects' fees for, 152, 188; what is a? 732  
Passmore Edwards institutions in Cornwall, 631  
Patent, fireproof flooring, 654  
Paving: apportionments and parks, 879; assessment, 621; charges and the L.C.C., 80, 115; hardwoods for, 930; noiseless, for stables, 654, 693  
Pawsons and Leafs new premises, 417  
Peabody trustee's report, 368  
Pegamoid, 834, 955  
Pembrokehire, sketch-book peeps at, 198  
Penrose, F. C., and the Parthenon, 403, 513  
Perigord, domed churches at, 269  
Permissible advertisements, 655  
Peterborough: brickmaking near, 807; cathedral, 890 (illustrations) 737 (present condition of) 737  
Petty swindle, a, 224  
Philadelphia, Smith monument, 404  
Phile, the temples of, 368  
Photographs of monuments and buildings, copyright in, 441  
Photography in new, a pulley by, 417; year-book of, 782  
Physical: experiment and engineering, 669; tests, digest of, 258, 782  
Pictures at the Academy, 625, 662, 697; the New Gallery, 627  
Pier, Morecambe, 220, 544  
Piers, brickwork, strength of, 692, 731  
Pillars, strength of, 382  
Pinchbeck, Kent, in re, 768  
Pine needles, decorative uses of, 880  
Pins, steel bridge, 892  
Pipe-laying, municipal v. contract, 808  
Pipes: steel, construction of, 892; wood and steel, 671  
Places of worship and public roads, 918  
Plan: asylum competition, 555; ground, of London, 403; peculiar church (Boston) 298  
Plans: dispute as to, 918; prepared by contractors, 153  
Plastic artist needs no festival, 661  
Plots: crooked, corners and, 920; vacant, cleared sites and, 336  
Plumbers: conferences at (Edinburgh) 733 (Nottingham) 733; London, 954; registration bill, 441 (opposition to) 477; Scottish, amalgamate, 368  
Plumbing, standard practical, 258  
Pneumatic ventilator, Kershaw's, 622  
Poets' corner improvement, 298, 475, 476  
Police station, Newcastle-on-Tyne, 91  
Pollution, rivers, 632  
Polytechnic institute, Clerkenwell (Northampton) 380; Holloway-road (Northern) 110  
Pompeii, mural paintings at, 695  
Population, city, of United States, 404  
Portland cement in America, 955  
Portrait: gallery, national, 509, 695, 769; painting, historical aspect of, 261  
Position of: architecture at the Academy, 629; provincial auctioneers, 303  
Possession, mortgages in, 367  
Poster design, Rhead's, 955  
Practical: plumbing, standard, 258; the, and the experimental, 661  
Practice, varied, 845  
Practitioner, the provincial, 301, 366  
Preliminary designs, remuneration for, 921  
Premium withheld, builder's, 441  
Present position of architecture Academy, 629  
Preservation, stone, 953  
Preservative for timber, cheap, 191



Preston master builders' association, 592  
Preventive medicine, institute of, 447  
Price-books: builders' (Laxton's) 187  
(Lockwood's) 78 (Spon's) 545; electrical  
engineers' (Griffin's) 619  
Prize drawings, Soane and Institute, 83, 91  
Process year-book, 782  
Procrastination-street, 407  
Professional cramming, 408  
Progress, architectural, 2  
Projections over footways, 693  
Promenade, Colwyn Bay, 584  
Proposed national union of British archi-  
tects, 79  
Prospective by-laws, attempt to enforce,  
189, 224  
Provincial: affiliation of architects, 773;  
auctioneers, position of, 303; conferences,  
society of architects, 442, 451; practi-  
tioner, the, 301, 366  
Prudential Assurance Co., 404  
Public: gardens association, metropolitan,  
261; health, Scotland, bill, 476; hot-  
water supply, 954; house, club designs,  
559; roads, places of worship and, 918  
Pulley under new photography, 417  
Pulling down houses, 694  
Pulpit, All SS., Chesterfield, 345  
Pulpwood, export duty on, 955  
Purification, sewage, 855

**QUANTITIES:** and contracts, 589,  
693, 805; architects and, 653, 692, 730,  
840; questions concerning, 771  
Quantity surveying and its abuse, 840  
Quarry worked, sone, 49  
Queensland: artesian wells in, 153; hard-  
wood timbers, 557, 703  
Questions: concerning quantities and con-  
tracts, 771; some burning, 883

**RAILWAY:** bridges for branch lines,  
836; improvements in Birmingham, 804;  
offices, Bombay, 419; stations (and  
ancient lights) 333, 402 (Colchester) 728  
(Edinburgh, Waverley) 692  
Railways: Central London, 50, 333, 547,  
655, 690, 694, 811, 856, 955; City and  
South London, 764; City and Waterloo,  
148, 237; Exeter, Teign Valley and  
Chagford, 856; light, 414; Newmills and  
Darvel, 856; North Cornwall, 690; Over-  
head, Liverpool, 856; Snowdon, 544  
Raine, Canon, the late, 766  
Rates and taxes, reapportionment of, 121  
Rathaus, Lübeck, 709  
Raw buildings and ripe ones, 480  
Reapportionment of rates and taxes, 121  
Rectory, Eccleston, 893  
Reed, A., and Son, in re, 583, 806  
Reflector, parabolic sound, at Calcutta, 586  
Refuse: destructor, Southampton, 656;  
disposal and sanitation, 274; scavenging,  
and water mains, 733  
Registered telegraphic addresses, 187  
Registration: architects' conferences at  
Bristol and Cardiff, 451 (in Ontario) 586;  
for builders, 477; plumbers, 441, 477  
Regulations, varying local, 126  
Remuneration for preliminary designs, 921  
Renaissance: English, 4; French, minor  
examples of, 925; modern, 88, 121, 157  
Rendle's invincible glazing, 261  
Repairs: road, 189; sewer, 841  
Reservoirs: Breeze-hill, Bottle, 583;  
Craigmaddie, Glasgow, 912  
Resources, local v. foreign substitutes, 264  
Responsibility of London vestries, 953  
Responsible, who is? 879  
Restorations, destructive, at Old Cairo, 4  
Restrictive covenants: 811; appeal, 225  
Rest, sailors', Genoa, 275  
Results of the new locomotion, 809  
Retrospective, not: building by-laws, 635;  
London Building Act, 732

Reviews: Academy Architecture, 116, 812;  
Alphabets, a Manual of Lettering, 782;  
Architect's Diary, Waterlow's, 78;  
Association of Surveyors of H. M. Service,  
619; Builders' Price Books (Laxton's)  
187 (Lockwood's) 78 (Spon's) 545;  
BUILDING NEWS Designing Club, 159, 270,  
337, 382, 559, 667, 816; Cathedrals of  
France, 803; Cottage Hospitals, General,  
Fever, and Convalescent, 342; Cottages  
and Country Buildings, 782; Digest of  
Physical Tests, 258, 782; Drawing in  
Elementary Schools, 258; Ecclesiastical  
Architecture of Scotland, 486; Economical  
Houses, 187; Edinburgh, Picture-sque  
Notes, 519; Electric Lighting and Power  
Distribution, 782; Engineers' Draughts-  
men's Work, 858; Engineers' Year-Book,  
619; Form of Spec. tion, St. Pierre  
Harris's, 59; Gentle. n's Magazine  
Library, Leicestershire, 782; Griffin's  
Electrical Engineers' Price-Book, 619;  
Handy Earthwork General Tables, 782;  
History of Architecture, B. Fletcher's,  
545; Housing of the Labouring Classes,  
112; Illustrated Europe, 782; Kendrick's  
Coefficients for Iron and Steel Beams,  
118; Leek and District Illustrated, 619;  
Lighting, Heating, and Cooking, 538; Lin-  
coln's Inn Fields, 781; London Churches  
of the XVII. and XVIII. Centuries, 519;  
London City Churches, 51; Metropolitan  
Sanitation, 545; Modern Office Building,  
545; Modern Opera-Houses and Theatres,  
887; Nooks and Corners of Pembroke-  
shire, 198; Portraits of Illustrious  
Personages of the Court of Henry VIII.,  
275; Practical Guide to Warming Houses  
from the Kitchen Fire, 619; Process  
Year-Book, 782; Richard Morris Hunt,  
His Art and Work, 112; Sculptures in

Lady Chapel at Ely, 55; Sell's Registered  
Telegraphic Address Directory, 187;  
Sewage Purification, 885; Sewerage and  
Sewage Disposal, 343; Sewerage  
Engineer's Note-Book, 781; Sheet Metal  
Worker's Instructor, 782; Society of  
Engineers' Transactions, 782; Standard  
Practical Plumbing, Vol. II., 258; Steel  
Sections, 295; Tabulated Weights of  
Angle and Tee Iron, 781; Theatre Panics  
and their Cure, 782; Timber and Wood-  
Working Machinery, 258; Wandering  
Scholar in the Levant, 545; West Ham  
Public Libraries, 113; Wood Industries  
of Sweden, 619; Year-Book of Photo-  
graphy, 782  
Richardson, Chas., the late, 258  
Richmond, Geo., R.A., the late, 473  
Riga white floors, 654  
Rights of way, disputes as to, 198  
Riparian ownership, Hindon v. Ashby, 512  
Ripe buildings and raw ones, 490  
River claims and applications, 810  
Riverless London, 332, 366  
Riverside warehouse design, 237  
Rivers pollution and conservancy, 632  
Road repairs, 189  
Roads, public, places of worship and, 918  
Robertson, Geo., the late, 258  
Rock, bolting to, 620  
Rolls Chapel, demolition of, 115  
Roman camp at North Marden, 442  
Rood: screen figures, legality of, 731, 879;  
screens of Devon, 586, 591, 654  
Roof: covering for verandah, 620; tile, 953  
Rooms, assembly, 56, 83, 123, 162, 337, 415,  
448, 560, 705, 742, 811, 848, 886, 928  
Rothwell, Market-house, 472  
Rowton house, King's Cross, 157  
Royal: Academy (architecture) 116, 626,  
664, 842 (exhibition) 275 (old masters at)  
51 (pictures) 625, 662, 697; architectural  
museum, 811; Cambrian Academy, 186,  
807; gold medal, 197, 226, 368; institute,  
British architects, 126, 197, 411, 485, 594,  
739, 854, 890 (finances) 653, 666, 730 (gold  
medal) 197, 226, 368, 590 (presidency) 595  
(prize drawings) 83, 91; institute, water  
colour painters, 373, 885; Scottish  
Academy, 115, 298, 331 (architecture at)  
399; society, British artists, 481

**SAFETY** valves for boilers, 299  
Sailors' rest, Genoa, 275  
Saint: Alban's (cathedral) 419 (monastery)  
513 (St. Michael's church) 728; Anne  
(Clapham, hall) 60 (Wandsworth) 931;  
Anselm (Davies-st., W.) 270; Barnabas  
(Morecambe) 857; Bartholomew (Ipswich)  
49 (Smithfield, E.C.) 807; David (Exeter)  
256, 296, 364; Francis (Holbeck, R.C.)  
294; Front (Perigueux) 269; George  
(Wolverton) 582; Helena (Lundy Isle)  
802; James (Barton-under-Needwood)  
876 (Whitfield) 364, 511; John Evangelist  
(Little Leighs) 110; John (Peterborough,  
schools) 618; Machar, 188; Margaret  
(Frisinghall) 294, 526 (Olton) 401; Mark  
(City-road, hospital) 632; Mary (Ban-  
bury) 599 (Callington) 618 (Hope) 259  
(Stainburn) 489 (Todmorden) 764; Mary-  
the-Virgin (New York) 774; Mary,  
Woolnoth, E.C., 148, 764; Matthew  
(West Ham) 802; Michael (Baldmore)  
294 (Garway) 802 (St. Alban's) 728, 807;  
Paul (Burton) 45 (Westham, Dorset)  
220; Paul's (cathedral decoration) 339,  
544, 588 (ecclesiastical society) 167;  
Peter (Colchester) 148 (Meavy) 950;  
Philip (Southport) 129; Pierre-en-Liens  
(Geneva) 411; Silvestro (Genoa, convent)  
45 Thomas (St. Anne's-on-Sea) 857  
Salford sewage works, 190  
Salisbury cathedral spire, 186, 328  
Salons: architecture at the, 773; Champ  
de Mars, 628; Champs Elysees, 665, 837  
Sanitary: institute certificate, 512;  
specialities, 416  
Sanitation: and disposal of refuse, 274;  
metropolitan, 545  
Savoy, sky sign, the, 260, 332, 918  
Scavenging refuse and water mains, 733  
Scholar, wandering, in the Levant, 545  
Schools: Accrington (St. John) 582; Bow  
(Coopers' Co.) 802; Brackley (Magdalen  
Coll.) 328; Bramley, Leeds (Bapt. Sun-  
day) 544; Camelford (Smith's) 223;  
Eccles (parish) 223; elementary, drawing  
in, 258; Essex-house, E. (handicraft)  
190; Hastings (Xt. Ch.) 582; Horsham  
(Christ's Hospital) 110; Leicester (art)  
783; Llandrindod Wells (intermediate)  
730; Llandysul (intermediate) 877;  
Llangollen (intermediate) 508; Peter-  
borough (St. John) 618; Shaw, 730;  
Southport (St. Philip) 129; Staleybridge  
(Bapt.) 223; Stockton (higher grade)  
148; Welshpool (county intermediate)  
256. See also under Grammar and  
Technical schools.  
Scotland: ecclesiastical architecture of,  
486; public health, bill, 476  
Scott, the Canny, 952  
Scottish: Academy, royal, 115, 298, 331  
(architecture at) 399; and English art,  
81; building trades federation, 695;  
plumbers amalgamate, 368  
Scott monument, Edinburgh, completion  
of, 190  
Screen, road figures, legality of, 731, 879  
Screens, church, Devonshire, 586, 591, 654  
Sculptry sinks, 556  
Sculptures in Ely Lady chapel, 55  
Sea water supply for London, 153  
Secrétaire, architect's, club designs, 337, 401  
Section 212 London Building Act, 225  
Selby v. Briggs, architect's fees, 162, 188

Sequel to a singular contract, 475  
Sewage: disinfectant, chlorine as, 257;  
disposal and sewerage, 343; purification,  
885  
Sewerage: and sewage disposal, 343;  
engineer's note-book, 781  
Sewer repair appeal, 811  
Sewers or drains, old, 917  
Sheet metal worker's instructor, 782  
Sheffield: master builders' association, 657;  
society of architects and surveyors, 110,  
259, 400, 562, 916  
Shields, Joseph, Carlisle, the late, 8  
Shingles, white cedar, 956  
Shire hall, Durham, 309  
Shops, Wimbeldon, 223  
Shoreditch baths and free library, 91, 113,  
126, 149, 167, 857  
Shrewsbury main drainage, 115  
Shutterwork, Belgian, 489  
Sidmouth, sewerage of, 115  
Signs, sky: 440; at the Savoy, 260, 332, 918  
Silchester, excavations at, 513, 657, 809  
Sinks: kitchen and scullery, 556; slop, 708  
Sites, cleared, and vacant plots, 336  
Skating palace, National, 112  
Sketch-book peeps at Pembrokeshire, 198  
Sky signs: 440; at the Savoy, 260, 332, 918  
Slag cement manufacture in Germany, 561  
Slate merchants, national association of, 695  
Slop-sinks, 708  
Small: public baths, club designs, 159;  
towns, water supply of, 585  
Smith v. Hough, builder's premium, 441  
Snowdon railway, 544  
Soane prize drawings, 83  
Societies: amalgamated carpenters and  
joiners, 622; architects, 125, 267, 409,  
591, 737 (provincial conferences) 442, 451  
(Cardiff and South Wales) 259 (Man-  
chester) 60, 653; architects and surveyors  
(Bradford) 220 (Sheffield) 110, 259, 400,  
562, 916; architects' benevolent, 399, 476;  
architectural (Devon and Exeter) 364,  
438, 950 (Edinburgh) 110, 167, 332, 784  
(Leeds and Yorkshire) 332, 474 (Liver-  
pool) 690 (York) 167, 508; British artists,  
481; building, 886; checking abuses of  
advertising, 226; ecclesiastical (St.  
Paul's) 167; encouragement of fine arts,  
110  
Soil-pipes, 450  
Soirée, the A.A., 743  
Some: burning questions, 883; results of  
the new locomotion, 809  
Sounds in Loch Lubnaig, 657  
Sound reflector, parabolic, at Calcutta, 586  
Southampton and their quantity surveyor,  
918  
South: Australia, timbers of, 779;  
Kensington museum (jewelry for) 191;  
London art galleries, Leighton memorial,  
417, 525  
Southgate v. Hunt, 152  
Spanish art at the New Gallery, 60  
Specialties, sanitary, 416  
Specification, a form of, 59  
Specify, what to, 736  
Spires and steeples, construction of steel,  
922  
Spon's price-book, 545  
Sprakes, C., Doncaster, in re, 225  
Stables: and cow standing, club designs,  
667; noiseless paving for, 654, 693  
Stained glass, 369, 656  
Staircase balustrades, 275  
Stair-treads, Mason's non-slipping, 622  
Standard practical plumbing, 258  
Stations: fire brigade (Blackfriars, E.C.)  
472; police (Newcastle-on-Tyne) 91;  
railway (and ancient lights) 333, 402  
(Central London) 333, 547, 655, 694, 841  
(Colchester) 728 (Edinburgh, Waverley)  
652  
Statues: Dunoon (Highland Mary) 512;  
Edinburgh (Knox) 806; Inverness (Flora  
Macdonald) 526  
Statutory registration of architects, confer-  
ences at Bristol and Cardiff, 451  
Steel: and wood pipes, 671; bridge pins,  
892; bridges, designing of, 53, 164, 340,  
522, 702, 776; building, a lofty, 952;  
frame construction for churches, 774;  
girders and joists, 295; pipes, construc-  
tion of, 892; spires and steeples, con-  
struction of, 926  
Stencilled fabrics and wall-hangings, 927  
Stencil, the modern, 305  
Stent, E. J., Neville, of New Jersey, the  
late, 729  
Stewardson, J., the late, 187  
Stock prizes, 128  
Stone-cutting and masonry, Hervey Flint  
on, 374, 439  
Stone: preservation, 953; quarry-worked,  
49  
Stonework, ill effects of cement on, 80  
Strand: -Holborn improvement scheme,  
399, 407, 877; West, widening, 656  
Street: architecture, 916; new Strand  
Holborn, 399, 407, 877; Procrastination,  
407  
Streets: new (by-laws as to) 655 (entrances  
to) 693; old and new, 475  
Strength of: brickwork piers, 692, 731;  
bridge and trestle timbers, 47; heated  
wrought iron, 298; pillars, 382  
Stresses in collar-beam, graphic determina-  
tion of, 56, 222, 231  
Strike, London building, 658, 696, 734, 769,  
808, 843, 881  
Structures, dangerous, 190  
Sub-contractors and builders, 694  
Substitutes, foreign v. local resources, 264  
Subways: Glasgow district, 365; Tower  
(arbitration) 367  
Successful appeal against magistrate's  
decision, 152

Suffolk-street, handicrafts in, 195  
Suggestion for dealing with rights of way,  
198  
Supervision, initial, 884  
Surface gullies, 523  
Surrey docks extension, 305, 856  
Surveying, quantity, and its abuse, 840  
Surveyor, county, Cheshire, 442, 586  
Surveyors' institution, 341, 414, 438, 695,  
707 (new premises) 439, 584  
Sweden, wood industries of, 619  
Swedish deals, 477  
Swindle, a petty, 224  
Sydney harbour, crossing, 116  
Synagogue, Hammersmith, 745

**TABLES:** arrangement of technical  
institutes, 266; Australasian hardwoods,  
558; drain-pipe, 344; handy general  
earthwork, 782; steel bridges, webs of,  
703; stresses on timber, 47; tests of  
(Australasian timbers) 483, 484 (bricks)  
486; velocity and discharge of sewage  
pipes, 269  
Tabulated weights of angle and tee iron, 781  
Tall buildings at Chicago, 769  
Tank, 511  
Tarred macadam, 226  
Taskmasters, advisers and arbitrators, 263  
Tasmanian hardwoods, 888  
Tate gallery, Millbank, 231  
Taxes, reapportionment of, 121  
Teak, toxic action of, 653, 692, 695  
Technical: college (Glasgow) 562; educa-  
tion board's exhibition, 447; institutes,  
230, 234, 265 (St. Helen's) 728; schools  
(Baths) 582 (Halifax) 110 (Hyde) 331  
(Leicester) 783 (Lowestoft) 767 (Stafford)  
472 (Taunton) 618 (Truro) 690  
Telegraphic addresses, registered, 187  
Tell-tale, boiler, 166  
Tenerife, architects' life at, 80  
Tent, is it a building, 475  
Tests: brickwork, 485; cement, water in,  
153; New South Wales hardwoods, 483,  
484; physical, digest of, 253, 782  
Tectonic order, architecture of, 444  
Tewkesbury abbey, 60, 186  
Thames: improvement of the, 769; Lower,  
navigation, 586  
Theatre panics and their cure, 782  
Theatres: Cambridge, 148; Cardiff  
(Empire) 690; Glasgow (Empire) 618;  
modern opera houses and, 837  
Thirlmere arbitration, 225, 768  
Tile roof, 953  
Till, W. S., Birmingham, retirement of,  
477, 622  
Timber framing, brickwork and, 693  
Timbers: brdge and trestle, strength of,  
47; cheap preservative for, 191; of  
Australasia, 163, 221, 233, 452, 557, 703,  
779, 847, 888, 930  
Tithe on building plots, 879  
Tombs, Silesian, 633  
Tomlin, T. P., in re, 918  
Tower: subway arbitration, 367; unlicensed,  
at Earl's Court, 841  
Town church designs: designing club, 270;  
Royal Academy, 129  
Town halls: Belfast, 805; Cleethorpes, 381;  
Cork, 402, 547, 586; Croydon, 764;  
Enniskillen, 876; Hunstanton, 401, 523;  
Lynn, 783; Perth, 472  
Towns: small, water supply of, 585; trees  
in, 117  
Toxic action of teak, 653, 692, 695  
Track behind us, the, 61  
Training, architectural, 267  
Tramways' valuation, 80  
Trap, drain-cleaning, 854  
Traps, drain, 484  
Treads, Mason's stair, 622  
Trees in towns, 117  
Trestle timbers, strength of, 47  
Trinity almshouses, Mile End-road, 807  
Trollope v. London Building Federation,  
655, 694, 731  
Truss, King-post, 693  
Trust, London water, 441  
Tullie house museum, Carlisle, 190  
Tunnels: Blackwall, 148, 403; Edinburgh  
(Caltoun) 186; Millwall and Greenwich, 728

**ULSTER:** the Anglo-Normans in, 890  
Umpire, fitness of an, 547  
Underpinning at Albert institute, Dundee,  
477  
Unfelt movements of the earth's crust, 586  
Unions, national: architects' assistants,  
952; British architects, 79  
United States: City population of, 404;  
federal buildings in, 549  
Upholsterers' conference, Birmingham,  
549, 586  
Up-to-date building, 335  
Urinals, 780  
Use: and abuse of auctions, 450; of colour,  
architect's, 594  
Utilitarian buildings, 516

**VACANT** plots, cleared sites and, 336  
Valuations and appraisements, 390  
Valve: closets, Doulton's, 729; safety, for  
boilers, 259  
Varied practice, 845  
Varying local regulations as to drains, 123  
Vaults, building over, 189, 368  
Ventilation: and heating, 127; of drains,  
329  
Ventilator, Kershaw's pneumatic, 622  
Verandah roof covering, 620  
Verdict, a ludicrous, 547, 586  
Vestries, London, responsibilities of, 953  
Vestry by-laws, 189, 224



Vicars, Albert, the late, 766  
Vickers, G. A., Andover, the late, 593  
Victorian hardwoods, 704, 779  
Village: hall, Knowsley, 876; public  
house, club designs, 559  
Vitiated and abnormal atmospheres, 112

**WAGES** of Wilts labourers, 333  
Waite v. Newbery, 189  
Walker, Gen. J. T., C.B., the late, 296  
Wall: hangings, stencilled, 927; party  
(and external wall) 737, 768 (architect's  
fees for) 152, 188 (what is a?) 732; ware-  
house, 768  
Walsall, building by-laws as to walls,  
733  
Wandering scholar in the Levant, 515  
Warehouse: furniture, 188; Manchester,  
489; riverside, 237; walls, 768

Warming: buildings by hot water, 889,  
924; houses from the kitchen fire, 619  
Washington, Domestic architecture in,  
851  
Waste: heaps, 150; pipes, 451  
Water: colour painters' institute, 873,  
885; colours (action of light on) 50 (at  
Guildhall art gallery) 591; company  
appeal, East London, 298; hot, warming  
buildings by, 888, 914, 924; in cement  
tubs, 153; mains and scavenging refuse,  
733; sea, supply for London, 153; trust,  
London, 441  
Waterloo and City railway, 148, 237  
Waterworks engineers' association, 583  
Way, rights of, disputes as to, 198  
Weights, tabulated, of iron and steel, 781  
Wells: artesian, Queensland, 153; Thos.,  
the late, 187  
Welsh water supply for London, 153, 260,  
333, 768

West end hall park, 190  
Western Australian hardwoods, 847  
Westgate-on-Sea, sewerage of, 768  
Wharf, foreign animals, Mode Wheel, 186  
What: is a party wall? 732; the public  
expect, 910; to specify, 736  
Wheel, great, Blackpool, 583  
When daffodils begin to peer, 515  
Whitechapel fine art exhibition, 513  
White floors, Riga, 654  
Who is responsible? 879  
Why architects neglect colour, 735  
Willesden paper for roofing, 955  
Wilson, J. A., Philadelphia, the late, 255  
Wilts C.C. labourers' wages, 333  
Winchester cathedral restoration, 807  
Woking main drainage, 226  
Wolverhampton water supply, 880  
Wood: and steel pipes, 671; carving and  
wood carvers, 197; green, moisture in,  
842, 880; industries of Sweden, 619;

paving, hardwoods for, 930; pulp carpet  
linings, 513  
Work for the new year, 1  
Workhouse: adjuncts and the Building  
Act, 403; infirmaries (Pontefract) 618  
(Shardlow) 619  
Workhouses: Ipswich, 472; Mildenhall, 345  
Working men's dwellings bill, 369  
Workmen, black lists of, 655, 694, 731  
Wrought iron, strength of heated, 298

**YATES v. Wilson**, 694  
Year-book: engineer's, 619; of photo-  
graphy, 782; process, 782  
Year's: City improvements, 442; failures, 50  
year, the new, work for, 1  
Y.M.C.A. premises, Newcastle, 893  
York: architectural society, 167, 508; the  
Bars of, 525  
Young and Marten's dinner, 299

## INDEX TO ILLUSTRATIONS.

\* \* The Lithographic Illustrations will be found immediately following the Pages indicated.

**AARAN**, concert hall, 742  
Abbeys: Dunfermline, 490; Tewkesbury  
(St. Edmund's chapel and s. aisle) 60  
Abingdon free library, 710  
Academy, royal: design for town church  
(T. G. Lucas) 10, 130, 238; trav. student-  
ship drawings (J. S. Stewart) 564, 818  
Accountants, chartered, institute of, 158  
Additions to Cold Harbour, Liphook, 10  
Adelphi bank, Liverpool, 10  
Administration offices, Central Indian rail-  
way, Bombay, 420  
Albi cathedral, south portal, 784  
Alhambra music hall, Leicester-sq., 928  
Ambler Thorn, Northowram, infants' bd.  
school, 490  
American: furniture, modern, 109; v. old  
English bond in brickwork, 620  
Angoulême cathedral, west front, 784  
Antwerp, staircase, Plantin museum, 746  
Apartment buildings, Boston, Mass., 894  
Apothecaries' Co., court-room and library,  
202  
Application of Classic details, 4, 5, 6, 88, 89,  
90, 120, 121, 157, 158, 159  
Architects: home (Brooklands, Cheshire)  
740; institute (Soane design, J. Anderson)  
346 (do., E. A. Rickards) 454; secre-  
taire and arm chair (club design), 346  
Architecture: ecclesiastical, of Scotland,  
487, 490; of Teutonic order, Marienburg,  
454, 471  
Arch moulding, 693  
Arm chairs: and secretaire, 490 (archi-  
tects) 346; circular, 617; William III.,  
617  
Art: galleries (Reading municipal build-  
ings) 982 (South London) 526; schools,  
Leicester, 784, 801  
Assembly rooms and concert halls, 56, 57,  
58, 59, 84, 85, 123, 124, 125, 162, 163, 338,  
339, 415, 448, 449, 560, 561, 706, 707, 742,  
743, 811, 812, 813, 814, 848, 849, 888, 887,  
928, 929  
Assurance premises, Johannesburg, 784  
Asylums, lunatic: 7, 8; East Riding,  
Beverley, 201, 219; Halle, 303; Munich,  
229  
Automatic flushing chamber, 344

**BADEN**, concert hall, 812  
Baldi palace, Genoa, cortile of, 10  
Bale, concert hall, 742, 743  
Balustrades, staircase, 293  
Banbury, St. Mary's church, 600  
Band-stand, Grissell design (J. H. Tonge)  
276, 346  
Banks: Glasgow (savings) 168; Leeds  
(Williams and Brown's) 838; Liverpool  
(Adelphi) 10; small branch, club designs,  
818, 835  
Barnato's mansion, Park-lane, W., 672  
Bars of York, the, 543  
Barton-hill, Bristol (bd. schools) 43  
Bath appliances, 668, 669  
Baths, public: Bether-green (Excelsior)  
448, 449; BUILDING NEWS club designs,  
185; Coventry, 130; Deptford, 60;  
Shoreditch, designs (Brewill, Bailey, and  
Mallows) 168 (Gibson and Russell) 92  
(Thomas and Son) 168  
Beith church, N.B., furniture of, 875  
Belgian Renaissance, 88, 90  
Berlin: Kroll's concert hall, 813; von  
Baumbach's Casino, 57  
Bethnal-green: Excelsior baths, 448, 449;  
museum, loan exhibition of furniture,  
949  
Beverley, East Riding lunatic asylum, 201,  
219  
Birmingham A.A. sketches, 564, 710  
Biscuit factory, Hayle, 127  
Black heath, Windermere house, 746  
Board schools: Ambler Thorn, North-  
owram, 490; Bristol (Barton-hill) 43  
(Greenbank) 490; Dagenham (infants')

853; Darenth, 168; Dudding-hill, Willes-  
den (W. D. Caroe's design) 382; Halifax,  
Caddy-field, 327; Llanrwst, 932; North  
Shields, Coach-lane, 727; Swindon,  
Clarence-st., 746  
Bodmin, Passmore Edwards free library,  
634  
Boiler tell-tale, 166  
Boleyn, Sir T., Holbein's portrait of, 276  
Bolton, Christ church, Heaton near, 894  
Bond in brickwork, American v. old  
English, 620, 692  
Bootham bar, York, 543  
Boston, Mass., dormitory and apartment  
buildings, 894  
Bradford, St. John's ch., Frizinghall, 526  
Brack bank, club designs, 818, 835  
Brickwork: American v. old English bond,  
620, 692; and timber framing, 620  
Bridges, steel, designing of, 53, 54, 155, 166,  
340, 522, 702, 776  
Brighton, house in First-avenue, 202  
Bristol board schools: Barton hill, 43;  
Greenbank, 490  
Brooklands, Cheshire, an architect's home,  
746  
Brussels: Flemish theatre, 887; palace of  
Justice, 88, 90; royal gallery, old masters  
at, 420, 490, 672, 818  
Buenos Ayres, trust loan premises, 202  
Builders' work, cast iron in, 77, 122, 123,  
200, 520, 521, 522, 596, 765, 766, 777, 778,  
779, 838, 839, 850, 851, 913, 951, 952  
BUILDING NEWS club designs: architect's  
secretaire and armchair, 346; bank,  
branch, 818, 835; baths, small public,  
185; church, small town, 276; game-  
keeper's cottage, 382; public-house,  
village, 564; stables and cowshed, 672, 689  
Bungalow, Kenilworth, 600  
Burgos cathedral towers, 818  
Burt miners' hall, Newcastle, 130  
Burton-on-Trent, organ, St. Paul's church,  
10  
Business premises: Brighthouse (co-opera-  
tive) 818; Buenos Ayres (trust) 202;  
Conduit-st., W. (Redfern's) 60; Duke-  
st., Grosvenor-sq., 564; Farringdon-  
avenue, E.C., 276; Glasgow (bank) 168;  
Hayle (factory) 127; Johannesburg  
(assurance) 784; Leeds (bank) 858;  
Liverpool (designs: selected, J. F. Doyle)  
634 (do., J. Belcher) 634, 710; Manchester  
(warehouse) 490; Motherwell (co-opera-  
tive) 600; Newton Heath (co-operative)  
932; South Shields, 255; Swansea, 581  
Buxton, house at, 454

**CABINET**, Chippendale, 490  
Caddy-field bd. school, Halifax, 327  
Caestres, Jacqueline van, Rubens's portrait  
of, 672  
Cannock Chase, Sister Dora convalescent  
hospital, 342, 343  
Canterbury cathedral, Hales' tomb, 130  
Cardiff, Cefn Coed house, 490  
Carlsruhe, feste halle, plan, 743  
Carpenters' hall, London Wall, 60  
Carvings: French panels, 803; Monte Carlo  
casino, 338, 339  
Casinos: Berlin (von Baumbach's) 57;  
Leipzig, 560, 561; Monte Carlo, 338, 339;  
Neustadt, 339; Oldenberg, 58, 59; Saar-  
bruck, 56, 57; Vienna (Adelphi's) 57, 58  
Casa de Monterey, Salamanca, 818  
Casket, Seeley presentation, 10  
Cast iron: in builders' work, 77, 122, 123,  
200, 520, 521, 522, 596, 765, 766, 777, 778,  
779, 838, 839, 850, 851, 913, 951, 952; stair-  
case balustrades, 293  
Castle: Acre, chancel screen, 200; Windor,  
Holbein's portraits at, 276, 600  
Cathedrals: Albi (s. portal) 784; Angou-  
lême (west front) 784; Burgos, 818;  
Canterbury (Hales' tomb) 130; Chartres

(nave and n. transept) 202; Cologne  
(south transept) 130; Kirkwall (St.  
Magnus) 490; Lincoln (by F. Mackenzie)  
346; Pisa (design in coloured woods  
from) 855; St. Alban's (nave roof decoration)  
420; St. Paul's (reredos) 159; Siena  
(pavement) 818; Worcester (by J. Powell)  
238  
Cecil, hotel, Embankment: great hall, 415;  
restaurant, fireplace, 600  
Cefn Coed house, Cardiff, 490  
Ceiling, groined, 377, 378  
Chairs: arm (architect's) 346 (circular) 617  
(Dutch) 490; dining-room, 109; easy,  
109; hall, 109, 490; moderator's and  
elder's, Beith ch., 875; Norwegian,  
quaint, 420; William III., 617  
Chamber, automatic flushing, 344  
Chapels: Holyrood, Edinburgh (Royal)  
518; Ile St. Honorat (old) 932; New-  
castle-on-Tyne (Wesln. Centenary) 454;  
Northampton (Meth. Free) 651; Out-  
lands, Huddersfield (Meth. New Conn.)  
600; Tewkesbury abbey (St. Edmund)  
60; Wolstanton (Wesln.) 526  
Charlottenburg, Floris hall, 707  
Chartered Accountants' institute, 158  
Chartres cathedral, nave interior, 202  
Cheapside: Grocers' hall, 564; Mercers'  
hall, drawing-room, 784  
Chester, Eccleston rectory, 894  
Chesterfield, oak pulpit, All SS. church, 346  
Chicago, staircase in house, 420  
Chilworth, Surrey, the Hallams, 10  
Chippendale cabinet and hall chair, 490  
Chipping Campden market-house, 564  
Christian and Faithful in Vanity Fair, by  
Alfred Jones, 10  
Christie library, Owens college, Man-  
chester, 672  
Christ, the dead, by Van Orley, 490  
Churches: Banbury (St. Mary) 600; Beith  
(furniture) 875; Burton-on-Trent (St.  
Paul, organ in) 10; Castle Acre (chancel  
screen) 420; Chesterfield (All SS., pulpit,  
346); City (St. Bartholomew the Great)  
55 (St. Mary Woolnoth) 54; Davies-st.,  
W. (Anselm, plan) 271; Dunfermline  
(abbey) 490; Dunning, N.B. (St. Serf)  
490; Ealing (Christ, cross) 310; Frizing-  
hall (St. Margaret) 526; Hampton-in-  
Arden, 710; Heaton-by-Bolton (Christ)  
894; Johnstone, Fem., 198; Knowsley  
(ych-gate) 92; large town (Academy  
design, T. G. Lucas) 10, 130, 238; Leuchars,  
N.B., 490; Loch Aoinard (St. Malrube,  
font) 487; Manorbere, 202; Morecambe,  
(St. Barnabas) 858; Newcastle-on-Tyne  
(Trinity Presbta.) 310; New York (St.  
Mary the Virgin, steel framed) 775;  
Nottingham (Meth. Free) 651; St.  
Anne's-on-Sea (St. Thomas) 858; Scar-  
borough Cliff, 634; small town (club  
designs) 276; Spitalfields (Christ) 526;  
Staiburn (St. Mary, W. R. Gleave's)  
design) 507; Swanage (Congl.) 420;  
Swanscombe (All SS.) 10; Tenby (St.  
Mary) 199; Tewkesbury abbey (sketches  
in) 60; Trafalgar-square (St. Martin-in-  
the-Fields) 4; Trunch (ringers' gallery)  
420; Wandsworth (St. Anne, additions  
to) 932; Wolstanton (Wesln.) 526  
Churchyard cross, Hilliard, Ealing, 310  
Cincinnati music hall, plan, 848  
Circular armchair, 617  
Cisterns, flushing, 597, 598  
City guilds: Apothecaries' court room and  
library, 202; Carpenters' hall, 60; Cutlers'  
hall, 382; Grocers' hall, 564; Mercers'  
Co. drawing room, 784; Skinners' hall  
and staircase, 894  
City markets, Sydney, 92  
City, the: churches (St. Bartholomew the  
Great) 55 (St. Mary Woolnoth) 54; Far-  
ringdon-avenue premises, 276; institute  
of Chartered Accountants, 158; St.  
Paul's cathedral reredos, 159

Clapham, St. Anne's house and hall, 60  
Clarence-street board schools, Swindon,  
746  
Clark hall, Paisley, 848  
Classic details and their application, 4, 5, 6,  
88, 89, 90, 120, 121, 157, 158, 159  
Cliff protection, Sheringham, 147  
Clock tower, Rouen, 925  
Cloister gallery, the Marienburg, 454  
Closets, trough, 814, 816  
Club, BUILDING NEWS designing: archi-  
tect's secretaire and armchair, 346;  
bank, branch, 818, 835; baths, small  
public, 185; church, small town, 276;  
gamekeeper's cottage, 382; public house,  
village, 564; stables and cowshed, 672,  
689  
Clubhouse, Philadelphia (University, fire-  
places) 238 (do., staircase) 420  
Cold Harbour, Liphook, additions to, 10  
Collarbeam truss, graphic determination of  
stresses in, 56, 222, 231  
Collation, the, by Metsu, 818  
College, Manchester (Owens, library) 672  
Cologne: cathedral, south transept, 130  
concert hall, 743  
Colwyn bay, houses at, 238, 437, 471  
Commandery buildings, Marienburg-on-  
Nagar, 454  
Communion table, Beith church, 875  
Companies, City, halls: Apothecaries', 202;  
Carpenters', 60; Cutlers', 382; Grocers',  
564  
Competition designs: board schools (North  
Shields, Conch-lane, selected, Marshall  
and Dick) 727 (Willesden, Dudding-hill,  
prem., W. D. Caroe) 382; BUILDING NEWS  
designing club (architect's secretaire and  
armchair) 346 (bank) 818, 835 (baths) 185  
(churches, small town) 276 (gamekeeper's  
cottage) 382 (public-house, village) 564  
(stables and cowshed) 672, 689; Grissell  
medal (bandstand, J. H. Tonge) 276, 346;  
insurance buildings (Liverpool, Royal,  
selected, J. F. Doyle) 634 (do., J.  
Belcher) 634, 710; Royal Academy (town  
church, T. G. Lucas) 10, 130, 238 (trav.  
studentship drawings, J. S. Stewart) 564,  
818; Shire hall (Durham, executed  
design, Barnes and Coates) 310; Soane  
(institute of architecture, J. Anderson)  
346 (do., E. A. Rickards) 454; S.K.  
national (drawing, "Christian in Vanity  
Fair," bronze med., A. Jones) 10 (river-  
side warehouse, silver medal, E. P.  
Reynolds) 238  
Concert halls and assembly rooms, 56, 57,  
58, 59, 84, 85, 123, 124, 125, 162, 163, 338,  
339, 415, 448, 449, 560, 561, 706, 707, 742,  
743, 811, 812, 813, 814, 848, 849, 888, 887,  
928, 929  
Conduit-st., W., Redfern's premises, 60  
Construction, factory, 554, 741, 852, 853,  
922, 923; steel spires, 926  
Continents, old masters on the, 92, 168, 420,  
490, 672, 818  
Convalescent hospital, Sister Dora, Milford,  
342, 343  
Convents: Genoa (S. Silvestro) doorway to,  
10; Marienburg, 454, 471  
Co-operative buildings: Brighthouse, 818;  
Motherwell, 600; Newton Heath, Man-  
chester, 932  
Cornwall, Passmore Edwards institutions  
in, 631  
Cortile of Palazzo Balbi, Genoa, 10  
Cottage, gamekeeper's, club designs, 382  
County: council buildings, Durham, 310;  
lunatic asylums, 7, 8, 201, 219, 229, 308  
Court-room, Apothecaries' hall, 202  
Court-yard, Somerset house, 4  
Coventry: public baths, 130; St. Mary's  
hall, 564  
Cowshed and stables, club designs, 672,  
689  
Cross, churchyard, Ealing, 310  
Cutlers' Co.'s hall, 382



**DAGENHAM**, infants' board school, 888  
Darenth board schools, 168  
Davies-st., W., St. Anselm's church, 271  
Dead Christ, the, by Van Orley, 490  
Decorations, Castle Acre channel screen, St. Alban's cathedral, nave roof, and Trunch ringers' gallery, 420  
Decorative furniture: Dean-Paul sale, 490; Goldsmid sale, 932  
Deptford, baths and municipal buildings, 60  
Designing club, *BUILDING NEWS*: architect's secretariat and armchair, 346; bank, branch, 818, 835; baths, small public, 185; church, small town, 276; game-keeper's cottage, 382; public-house, village, 564; stables and cowshed, 672, 689  
Designing of steel bridges, 53, 54, 165, 166, 340, 522, 702, 776  
Designs: bandstand (Grissell, J. H. Tonge) 276, 346; board schools (Dudding-hill, Willesden, W. D. Caroe) 382; *BUILDING NEWS* club, 185, 276, 346, 382, 564, 672, 689, 818, 835; churches (Stainbury, R. A. Gleaves) 507 (town, R. A., T. G. Lucas) 10, 130, 238; institute of architects (Soane, J. Anderson) 346 (do., E. A. Rickards) 454; riverside warehouse (National, E. P. Reynolds) 238; town church (R. A., T. G. Lucas) 10, 130, 238  
Details: bandstand, 276, 346; baths (Deptford) 60; bridges, steel, 53, 54, 165, 166, 340, 522, 702, 776; casino (Monte Carlo) 338, 339; casket, presentation, 10; cast iron in builder's work, 77, 122, 123, 200, 520, 521, 522, 596, 765, 766, 777, 778, 779, 888, 889, 890, 951, 913, 951, 952; Classic, and their application, 4, 5, 6, 88, 89, 90, 120, 121, 157, 158, 159, 925; door fastener, 295; drainage, 197, 323, 344, 379, 390, 412, 413, 451, 484, 485, 523, 524, 556, 557, 597, 598, 668, 669, 708, 740, 780, 781, 814, 815  
Door fastener, new, 295  
Doorways: convent of S. Silvestro, Genoa, 10; St. Serf's church, Dunning, 490  
Dora (Sister) convalescent hospital, Milford, 342, 343  
Dormitory and apartment buildings, Boston, Mass., 894  
Dover Castle hotel, Westminster Bridge-road, 763  
Drainage: domestic, notes on, 197, 329, 344, 379, 390, 412, 413, 451, 484, 485, 523, 524, 556, 557, 597, 598, 668, 669, 708, 740, 780, 781, 814, 815; plan for small residence, 197  
Drain: cleaning trap, 854; pipe joints, 379, 390; ventilation, 329  
Drawing-room, Mercers' hall, 784  
Drawings: measured, by J. J. Joass (nave roof St. Alban's, ringers' gallery, Trunch and screen, Castle Acre) 420 (tomb, Canterbury cathedral) 130; trav. student-ship (J. S. Stewart) 564, 818  
Dresden: concert hall plan, 783; royal gallery, pictures in, 92, 168  
Drill hall, St. George's rifles, 84, 85  
Dudding-hill bd. schools, Willesden, W. D. Caroe's design, 382  
Duke-st., Grosvenor-sq., premises in, 564  
Dunfermline: abbey, nave, old houses, and refectory, 490  
Dunning, N.B., St. Serf's church, 490  
Dunno: Pisa (device in) 855; Siena, pavement, 815  
Durham Shire hall, 310  
Dutch: armchair, 490; paintings, 92, 420, 818  
**EALING**, memorial cross, at Christ church, 310  
East Riding lunatic asylum, Beverley, 201, 219  
Easy chairs, 109  
Ecclesiastical architecture of Scotland, 487, 490  
Eccleston rectory, Chester, 894  
Edinburgh: chapel royal, Holyrood, 518; tombs in Greyfriars, 519  
Edzell, Panmure arms hotel, 784  
Edwards, Passmore: art gallery (Fourth London) 526; free libraries (Bodmin) 634 (Hammersmith, rebus in panel, 382 (Liskeard, 238, 257 Nunhead 564 (St. Ives) 634 (Shoreditch, designs, Brewill, Bailey, and Mallows) 168 (Gibson and Russell) 92; institutions in Cornwall, 631 (Shoreditch, Kingsland-road) 631  
Elbow chair of William III., 818  
Elliott, Sir T., Holbein's portrait of, 600  
Elms, the, Rochester, porch to, 92  
Embankment, Victoria, hotel Cecil, 416, 600  
English: old, v. American bond in brick-work, 620; paintings, 238, 276, 346; Renaissance, 4, 5, 6, 157, 158, 159  
Evesham, Vicarage Court gateway, 564  
Excellior swimming baths, Bethnal-green, 419, 449  
Exhibition, furniture, Bethnal Green museum, 949  
**FACTORY**: construction, 554, 741, 852, 853, 922, 923  
Hayle (biscuit, 127

Fastener, new door, 295  
Farringdon-avenue, buildings in, 276  
Fife house, Whitehall, details from, 5, 6  
Finchley, N., Glenroy house, 420  
Fireplaces: hotel Cecil, 600; University club, Philadelphia, 238  
Flamborough, South Sea house, 310  
Flemish paintings, 490, 672  
Floriss hall, Charlottenburg, 707  
Flushing: chamber, automatic, 344; cisterns, 597, 598  
Font, Beith church, N.B., 875  
Four Oaks, Sutton Coldfield, house at, 346  
Framing, timber, and brickwork, 620  
Frankfort, concert hall plans, 124, 706, 813  
Free libraries: Abingdon, 710; Bodmin (Passmore Edwards) 634; Hammersmith (panel rebus) 382; Hyde, 310; Kingsland-road, Shoreditch (Passmore Edwards) 858; Liskeard (Passmore Edwards) 238, 257; Newcastle-on-Tyne (Stephenson) 130; Nunhead (Passmore Edwards) 564; St. Ives (Passmore Edwards) 634; Shoreditch designs (Brewill, Bailey, and Mallows) 168 (Gibson and Russell) 92 (Thomas and Son) 168  
French: carved wood panels, 803; Renaissance (modern) 89, 120, 121; (old) 925  
Frensham, house at, 818  
Frizinghall, St. Margaret's church, 526  
Furniture: at royal school of art needle-work, 888; Belgian, 507; Bethnal Green museum (loan) 949; church (Beith) 875; decorative, 617 (Dean Paul sale) 490; (Goldsmid sale) 932; modern American and German, 109  
**GALLERIES**: art (Reading) 382 (South London) 526; cloister, Marienburg, 451; picture, paintings in (Brussels royal) 420, 490, 672, 818 (Dresden royal) 92, 168; ringers', Trunch church, 420  
Gamekeeper's cottage, club designs, 382  
Gates, city, York, 513  
Gateway at Evesham, 564  
Genoa: cortile of Balbi palace, 10; doorway, convent of S. Silvestro, 10; sailors' rest, 276  
German furniture, modern, 109  
Glasgow savings bank, 168  
Glenroy house, Finchley, 420  
Goldsmid sale, furniture at, 932  
Gower-st., University college hospital, 672  
Grand saloon, Prince's hall, 300, 310  
Graphic determination of stresses in collar-beam truss, 56, 222, 231  
Greenbank bd. schools, Bristol, 490  
Greyfriars churchyard, Edinburgh, tombs in, 519  
Grissell design for bandstand (J. H. Tonge) 276, 346  
Grocers' hall, 564  
Groined ceiling, 347, 378  
Guilts, City: Apothecaries' Co. court-room and library, 202; Carpenters' hall, 60; Cutlers' hall, 389; Grocers' hall, 564; Mercers' hall, 784; Skinners' staircase, 804  
Gullies, surface, 523, 524  
**HAGGERSTON** free library, Shoreditch, 858  
Hales tomb, Canterbury cathedral, 130  
Halifax, Caddy-field board school, 327  
Hallams, the, Chilworth, Surrey, 10  
Hall chairs, 109, 490  
Halls: Apothecaries' Co., 202; Brighton, house at, 202; Carpenters' Co., 60; Charlottenburg (Floris) 707; Cincinnati (music) 848; Clapham (St. Anne) 60; concert and assembly rooms, 56, 57, 58, 59, 84, 85, 123, 124, 125, 162, 163, 338, 339, 415, 448, 449, 560, 561, 706, 707, 742, 743, 811, 812, 813, 814, 845, 849, 886, 887, 928, 929; Coventry (St. Mary) 564; Cutlers' Co., 382; Durham (Shire) 310; Embankment hotel Cecil 415; Frankfurt (concert) 706; Grocers' Co., 564; Holborn (King's) 162, 163; Leipzig (concert) 560, 561; lunatic asylum, 303; Maer, Whitmore, 746; Mercers' Co., 784; Motherwell (co-operative) 600; Neustadt (public) 339; Newcastle-on-Tyne (Burt) 130; Paisley (Clark) 818; Penze (vestry) 448; Piccadilly (Prince's) 309, 510; Regent-st. (Queen's) 560; Skinners' Co., 894; St. Leonard's-on-Sea, 560; Stuttgart (Lieder) 706; Vienna (musical union) 706, 707; Woodbridge (Seckford) 238  
Hals, Frans, portrait of W. van Heythuyzen, 420  
Hamburg, concert-hall plan, 814  
Hammersmith: free library, rebus in panel, 382; synagogue, 746  
Hampstead, proposed house in Platt's-lane, 818  
Harditon-in-Arden church, 710  
Harmonium paving, 889  
Harway hall, Heilbronn, 123, 124  
Haverfordwest, old staircase at, 202  
Hayle, biscuit factory, 127  
Heaton, Bolton, Christ church, 894  
Heilbronn, harmony hall, 123, 124  
Helmsbury, four houses at, 168  
Heythausen, W. van, Hals' portrait of, 420  
Hilliard memorial cross, Ealing, 310  
Hind Head, Hurstmere house, 111  
Hirschberg, Silesia, tombs at, 634  
Hoehschloss, Marienburg, 434  
Holbein's portraits, Windsor castle: Sir T. Boleyn and a Lady, 276; Sir T. Elliott and Duchess of Suffolk, 600  
Holborn: restaurant, King's hall, 162, 163; to Strand improvement scheme, 399  
Holyrood, Royal chapel, 518

Home: an architect's (Brooklands, Cheshire) 746; sailors' (Genoa) 276  
Horloge, la Grosse, Rouen, 925  
Hospitals: Milford (Sister Dora convalescent) 342, 343; University college (proposed reconstruction) 672  
Hotels: Edzell (Panmure Arms) 784; Embankment (Cecil, great hall) 415 (do., restaurant fireplace) 600; Westminster Bridge-road (Dover Castle) 763  
Hot water, warming buildings by, 888, 915, 924  
Housemaids' slop-sinks, 708  
Houses: Boston, Mass., 894; Brighton (First-avenue) 202; Brooklands, Cheshire (architect's) 746; Buxton, 454; Cefn Coed, Cardiff, 490; Chicago (staircase) 420; Clapham (St. Anne) 60; Cold Harbour, Liphook (additions to) 10; Colwyn bay, 238, 437; Duke-st., Grosvenor-sq., 564; Dunfermline, 490; Eccleston (rectory) 894; Elms, Rochester (porch to) 92; Fife, Whitehall (screen details) 5, 6; Frensham, 818; Glenroy, Finchley, 420; Hallams, the, Surrey, 10; Hampstead (proposed) 818; Haverfordwest (staircase) 202; Helmsbury (four) 168; Hurstmere, Hind Head, 111; Kenilworth (bungalow) 600; Knutsford, Cheshire (proposed) 932; Maer (hall) Whitmore, 746; Norfolk, 710; Paris (details) 121; Park-lane (Barnato's) 672; Rochester, 202; Rossett, the, Freshwick, 804; Scarborough (Park lodge) 818; Seckford (hall) Woodbridge, 238; Shroverwick, Somerset, 710; Shrewsbury, 564; small, drainage plan, 197; Somerset, 5 (courtyard front) 4; South Sea, Flamborough, 310; Surrey, dining-room, in a, 858; Sutton Coldfield, 363; Swanage, 818; Thornton, Cheshire, 526; Vicarage court, Evesham, 564; Warwickshire (old half-timbered) 710; Windermere, Blackheath, 746  
Huddersfield, Meth. New Connexion chapel at Outlands, 600  
Hunstanton, district council buildings, 526  
Hurstmere house, Hind Head, 111  
Hyde free library and technical school, 310  
**ILE ST. HONORAT**, old chapel, 932  
Imperial institute, 159  
Inspection chambers, 412, 413  
Institute: Imperial, 159; of architects (Soane design, J. Anderson) 346 (do., E. A. Rickards) 454; of chartered accountants, 158  
Institutions, Passmore Edwards, in Cornwall, 631  
Insurance buildings, Liverpool (Royal) designs: selected, J. F. Doyle, 634; J. Belcher, 634, 710  
Intercepting traps, 484, 485  
Interrupted music lesson, by Slingehand, 92  
Iron, cast: in builders' work, 77, 122, 123, 200, 520, 521, 522, 596, 765, 766, 777, 778, 779, 836, 839, 850, 851, 913, 951, 952; staircase balustrades, 293  
Islington Grand theatre, plans, 849  
**JACQUELINE** van Caestre's portrait, by Rubens, 672  
Johannesburg, Mutual assurance buildings, 784  
Johnstone church, Pembroke-shire, 198  
Joints of drain pipes, 379, 380  
Jones, Owen: studentship drawings: decorations in Norfolk churches (J. J. Joass) 420 (Hales tomb, Canterbury cathedral, do.) 130  
Justice, palace of, Brussels, 88, 90  
**KENILWORTH**, the Bungalow, 600  
Kensington: Imperial institute, 159; south, museum (Mackenzie's Lincoln cathedral) 346 (Powell's Worcester cathedral) 238  
King-post truss, 620, 693  
King's: hall, Holborn, 162, 163; Lynn, municipal buildings, 784  
Kingsland-road free library, Shoreditch, 858  
Kirkwall, St. Magnus' cathedral, 490  
Kitchen sinks, 556, 557  
Knowsley church, lych-gate, 92  
Knutsford, house at, 932  
Köthen assembly hall, 124  
**LACQUER** table, 617  
Lady, portrait of a, by Holbein, 276  
Lament over the Dead Christ, by Van Orley, 490  
Large town church, R.A. design (T. G. Lucas) 10, 130, 238  
Latines, 814, 815  
Lavatories, 740  
Leeds, Williams and Brown's bank, 858  
Leicester-square, W.C., Alhambra music hall, 928  
Leicester, technical and art schools, 784, 801  
Leighton memorial art gallery, Peckham-road, 526  
Leipzig: Crystal Palace concert hall, 124, 125; old and new concert halls, 560, 561  
Leuchars church, N.B., 490  
Libraries: Apothecaries' Co., 202; Manchester (Christie, Owens college) 672  
Libraries, free: Abingdon, 710; Bodmin (Passmore Edwards) 634; Haggerston (Passmore Edwards) 858; Hammersmith (panel rebus) 382; Hyde, 310; Liskeard (Passmore Edwards) 238, 257; Newcastle-on-Tyne (Stephenson) 130; Nunhead (Passmore Edwards) 564; St. Ives (Passmore Edwards) 634; Shoreditch, designs (Brewill, Bailey, and Mallows) 168 (Gibson and Russell, 92 (Thomas and Son, 168

Liederhalle at Stuttgart, 706  
Lincoln cathedral, by F. Mackenzie, S.K.M., 346  
Liphook, additions to Cold Harbour, 10  
Liskeard, Passmore Edwards free library, 238, 257  
Liverpool: Adelphi bank, 10; Royal insurance buildings, designs (selected, J. F. Doyle) 634 (J. Belcher) 634, 710  
Llanwrthol board schools, 932  
Loch Aoinard, Skye, font at St. Malrube's, 487  
Lodge, Scarborough, Park, 818  
London: city churches, 54, 55; South, art gallery, 526; Wall, Carpenters' hall, 60  
Lubeck, staircase to Rathaus, 710  
Lunatic asylums: 7, 8; East Riding, Beverley, 201, 219; Halle, 303; Munich, 229  
Lych-gate, Knowsley church, 92  
Lynn, municipal buildings, 784  
**MACKENZIE'S** Lincoln cathedral (S. Kensington museum) 346  
Maer hall, Whitmore, additions to: 746; interior great hall, 746  
Manchester: Christie library, Owens college, 672; warehouses and offices, 490  
Manholes, 412, 413, 484  
Manorbere church, 202  
Mansion in Park-lane, B. Barnato's, 672  
Map, Strand-to-Holborn improvement scheme, 399  
Marburg, the Commandery, 454, 476  
Market house, Chipping Campden, 564  
Markets, Sydney, 92  
Masonry and stone-cutting, 374, 375, 377, 378  
Masters, old: at Windsor Castle, 276, 600; on the Continent, 92, 168, 420, 490, 672, 818  
Mayfair, W. St. Anselm's church, 271  
Measured drawings, tomb (Canterbury cathedral, Hales, J. J. Joass) 130  
Memorial cross (Hilliard) Christ Church, Ealing, 310  
Mercers' Co. hall, drawing-room, 784  
Metsu, Gabriel, the Collation by, 818  
Micklegate bar, York, 543  
Mildenhall new workhouse, 346  
Mile End-road, Paragon music-hall, 929  
Milford, Staffs, Sister Dora Convalescent hospital, 342, 343  
Miners' hall, Newcastle-on-Tyne, 130  
Minor examples of the French Renaissance, 925  
Miser, the, by G. Nogari, 168  
Moderator's chair, Beith church, 875  
Modern: American and German furniture, 109; Renaissance, 4, 5, 6, 88, 89, 90, 120, 121, 157, 158, 159  
Monk bar, York, 543  
Monte Carlo casino, 338, 339  
Monuments at Hirschberg, Silesia, 634  
Moorgate-st., chartered accountants' institute, 158  
Morecambe, St. Barnabas' church, 858  
Motherwell, co-operative premises, 600  
Moulding, arch, 693  
Munich asylum plans, 229  
Municipal buildings: Leptford, 60; Hunstanton, 526; King's Lynn, 784; Reading art gallery, 382  
Museums: Antwerp (Platin, staircase) 746; Bethnal Green (furniture at) 949; South Kensington (Mackenzie's Lincoln cathedral) 346 (Powell's Worcester cathedral) 238  
Music: halls (Alhambra) 928 (Cincinnati) 848 (Oxford) 925, 929 (Paragon, Mile End-road) 929; lesson interrupted, by Slingehand, 92  
Mutual life assurance buildings, Johannesburg, 784  
**NATIONAL**: design (riverside warehouse, silv. med., E. P. Reynolds) 238; drawing (bronze medal, Christian in Vanity Fair, Alfred Jones) 10  
Needlework, art furniture at school of, 858  
Neustadt public hall, plans, 339  
New: door fastener, 295; Hunstanton town hall, 526; photography applied to a pulley, 417; Scotland-yard, police offices, 158; York, steel-framed church (St. Mary Virgin) 77  
Newcastle-on-Tyne: Burt Miners' hall, 130; police station, Scotswood-road, 92; Stephenson free library, 130; Trinity Presbyterian ch., 310; Wesk. an Centenary chapel, 454; Y.M.C.A., premises, 894  
Newton Heath co-operative stores, 932  
Nogari's Miser, Dresden gallery, 168  
Norfolk, mansion, steward's house and stables, 710  
Northwood, Ambler Thorninfants' school, 490  
North Shields, Coach-lane bd. schools, 727  
Norwegian table and chair, 420  
Notes on domestic drainage, 197, 329, 344, 377, 378, 412, 413, 451, 484, 485, 523, 524, 556, 557, 597, 598, 668, 669, 708, 740, 780, 781, 814, 815  
Nottingham, Meth. Free church and school, 651  
Nunhead, Passmore Edwards free library, 564  
**OFFICES**: Bombay (railway administrative) 420; Manchester (and warehouses) 490; Newcastle (Burt miners') New Scotland-yard (police) 158  
Old: chapel, Ile St. Honorat, 932; English v. American bond, 620; masters on the Continent, 92, 168, 420, 490, 672, 818; Windsor castle, 276, 600  
Oldenburg, casino, 58, 59  
Opera house, façade, Paris, 89



Organ, St. Paul's, Burton-on-Trent, 10  
Orley, Van, a Pieta by, 490  
Outlane, Huddersfield, Meth. New Con-  
nexion chapel and school, 600  
Owen Jones drawings (decorations in  
Norfolk churches) 420 (Hales tomb,  
Canterbury cathedral) 130  
Owens college, Manchester, Christie  
library, 672  
Oxford music-hall, Oxford-street, W.C.,  
928, 929

**PAINTINGS:** Dutch, 92, 420, 818;  
English, 288, 276, 346, 600; Flemish, 490,  
672; Venetian, 168  
Paisley, Clark hall, plans, 848  
Palaces: Brussels (Justice) 88, 90; Genoa  
(Balbi, cortile of) 10  
Panel rebus, Hammersmith free library,  
884

Pannure Arms hotel, Edzell, 784  
Panels. French carved, 803  
Pantograph, the, 835  
Paragon music-hall, Mile End-road, 929  
Paris: Grand Opera house, 89; modern  
Renaissance details, 121  
Parish hall, Clapham (St. Anne's) 60  
Park-lane, W., B. Barnato's mansion, 672  
Passmore Edwards: art gallery (South  
London) 526; free libraries (Bodmin)  
634 (Hammersmith, panel rebus) 382  
(Liskeard) 238, 257 (Nunhead) 564 (St. Ives)  
634 (Shoreditch, designs, Brewill,  
Bailey, and Mallows) 168 (do., Gibson  
and Russell) 92 (do., Thomas and Son)  
168 (Shoreditch, Kingsland-road) 838;  
institutions in Cornwall, 631  
Patterns, wood, for cast iron, 520, 521, 522  
Pavement, Siena cathedral, 818  
Paving, Australian hardwood, 889  
Peckham-road, South London art gallery,  
526

Pembrokehire sketches, 198, 199, 202  
Pend tower, Dunfermline abbey, 490  
Penge vestry hall, 448  
Philadelphia, University clubhouse: 238;  
staircase, 420  
Photography, new, a pulley by the, 417  
Piccadilly, Prince's restaurant, 309, 310  
Pictures: Brussels royal gallery, 420, 490,  
672, 818; Dresden royal gallery, 92, 168;  
St. Kensington museum, 238, 346;  
Windsor castle, 276, 600

Pieta, by Van Orley, at Brussels, 490  
Pilgrim's Progress illustrated, 10  
Pipes, drain, joints of, 379, 380  
Pisa cathedral, design in coloured woods  
from, 855  
Plans: art gallery (South London) 526;  
assembly hall (Frankfort) 124 (Heil-  
bronn) 123, 124 (Köthen) 124 (Leipsic,  
Crystal palace) 124, 125; asylums, lunatic  
(Beverly, East Riding) 219 (Halle) 303;  
bandstand, 276; banks (branch) 818, 835  
(Leeds) 858; baths and free library  
(Shoreditch, Brewill, Bailey, and  
Mallows) 168 (do., Gibson and Russell)  
92 (do., Thomas and Son) 168; baths  
(Bethnal green, Excelsior) 448, 449 (club  
designs) 185 (Coventry) 130; board  
schools (Bristol, Barton - hill) 143  
(do., Greenbank) 490 (Dagenham)  
858 (Darenth) 168 (Halifax, Caddy-  
field) 327 (Llanrwst) 932 (Northowram,  
Ambler Thorn) 490 (Swindon, Clarence-  
st.) 746 (Wilkesden, Dudding-hill, design  
by W. D. Caroe) 382; business premises  
(Buenos Ayres) 202 (Motherwell, co-  
operative) 600; casinos (Berlin, von  
Baumbach's) 57 (Monte Carlo) 28  
(Neustadt) 339 (Oldenburg) 58 (Saar-  
bruck) 56 (Vienna, Adelige's) 57,  
58; chapels (Newcastle - on - Tyne,  
Wesln.) 454 (Outlands, Huddersfield,  
Meth. New Con.) 600; churches  
(Banbury, St. Mary) 600 (Davies-  
st., W., St. Anselm) 271 (Dunning,  
St. Serf) 490 (Frizinghall, St. Mar-  
garet) 526 (Heaton, Christ) 894  
(Leuchars) 490 (Newcastle-on-Tyne,  
Trinity, Presb'tn.) 310 (Nottingham,  
Meth. Free) 634 (Scarborough Cliff) 634  
(Stainburn, design by W. R. Greave) 509  
(Swanage, Congl.) 420 (Swanscombe, All  
S.S.) 10 (town, club design) 276 (do., R.A.  
design) 130 (Wolstanton, Wesln.) 526;  
commandery (Marienburg) 471; concert  
halls (Aaran) 742 (Baden) 812 (Bale) 742,  
743 (Berlin) 813 (Carlsruhe) 743 (Char-  
lottenburg) 707 (Dresden) 743 (Frank-  
fort) 706, 813 (Hamburg) 814 (Strasburg)  
813, 814 (Stuttgart) 706, 811, 812 (Vienna)  
706, 707, 812; cottage, gamekeeper's  
(club design) 382; cro.s (Ealing, church-  
yard) 310; drainage (small house) 197;  
drill hall (St. George's rifles) 81, 85;  
factories, 554, 741, 552, 853, 922,  
923; groin, 377, 378; hall (Clap-  
ham, St. Anne) 60 (Leipsic) 560,  
561 (Maer hall, Whitmore) 746 (New-  
castle miner's) 130 (Paisley, Clark  
848 (Piccadilly, Prince's) 309 (Regent-st.,  
Queen's) 560 (St. Leonard's-on-Sea) 560;  
hospitals (Milford, Sister Dora, convales-  
cent) 342, 343 (University college) 672;  
hotel (Edzell, Pannure Arms) 784;  
houses (Boston, Mass.) 894 (Buxton) 454  
(Cefn Coed, Cardiff) 490 (Colwyn Bay)  
238, 437 (Frensham) 818 (Glenroy,  
Finchley) 420 (Hallams, Surrey) 10  
(Hampstead) 818 (Helensburg) 168  
(Hustmere, Hind Head) 111 (Kenilworth,  
bungalow) 600 (Norfolk) 710 (Park-lane)  
672 (Prestwich) 894 (Rochampton) 202  
(Scarborough, Park lodge) 818 (South  
Sea, Flamborough) 310 (Sutton Coldfield)  
363 (Swanage) 818 (Thornton, Cheshire)  
526; institute of architects (Soane, J.

Anderson) 346 (do., E. A. Rickards) 454;  
free libraries (Abingdon) 710 (Bodmin,  
Passmore Edwards) 634 (Liskeard, Pass-  
more Edwards) 257 (Newcastle, Stephen-  
son) 130 (Nunhead, Passmore Edwards)  
564 (St. Ives, Passmore Edwards) 634  
(Shoreditch, Passmore Edwards) 858;  
library (Manchester, Christie) 672;  
markets (Sydney) 92; municipal build-  
ings (King's Lynn) 784; music halls  
(Alhambra, Leicester-st.) 928 (Oxford)  
928 (Paragon, Mile End-road) 929  
(Cincinnati) 848; police station (New-  
castle-on-Tyne) 92; public-hall (Neustadt)  
339; public-house (village, club) 564;  
railway offices (Bombay) 420; rectory  
(Eccleston) 894; restaurant (Holborn,  
King's Hall) 162, 163; schools (Leicester,  
technical and art) 501 (Southport, St.  
Philip) 130; sea wall (Sheringham) 147;  
stables and cowshed (club) 672, 689;  
staircase, elliptical, 374; theatres, 886  
(Brussels, Flemish) 887 (Islington,  
Grand) 849; town hall (Hunstanton)  
526; vestry hall (Penge) 448; warehouses  
(Manchester) 490 (riverside, E. P.  
Reynolds) 238; workhouse (Mildenhall)  
346; Y.M.C.A. premises (Newcastle) 894  
Plantin museum, Antwerp, 746  
Police: offices, New Scotland-yard, 158;  
station, Newcastle-on-Tyne, 92  
Porch: Albi cathedral (south) 784; Re-  
naissance, 157; the Elms, Roehampton, 92  
Portico, Somerset house, 5  
Portraits: Hals (Wilhelm van Heythuysen)  
402; Holbein (Sir T. Boleyn a lady) 276  
(Sir T. Eliott and Duchess of Suffolk)  
600; Rubens (Jacqueline van Caestre) 672  
Powell's Worcester cathedral, S. K. M., 238  
Premises: Brighouse (co-operative) 818;  
Buenos Ayres (trust) 202; Conduit-st.,  
W. (Redfern's) 60; Duke-st., Grosvenor-  
sq., 564; Farringdon-avenue, E.C., 276;  
Glasgow (bank) 168; Hayle (factory)  
127; Johannesburg (Mutual assurance)  
784; Leeds (bank) 854; Liverpool (bank)  
10 (Royal insurance, designs, selected,  
J. F. Doyle) 634 (do., J. Belcher) 634,  
710; Manchester (warehouses and offices)  
490; Motherwell (co-operative) 600;  
Newcastle-on-Tyne (Y.M.C.A.) 894;  
Newton Heath (co-op.) designs, 932  
South Shields, 255; Swansea, 581  
Presentation casket, Seeley, 10  
Prestwich, the Roost, 894  
Prince's restaurant, Piccadilly, 309, 310  
Public: baths and free library (Shoreditch,  
Brewill, Bailey, and Mallows) 168 (do.,  
Gibson and Russell) 92 (do., Thomas and  
Son) 168; baths and municipal buildings  
(Leptford) 60; baths (Coventry) 130;  
buildings (Reading) 382; hall (Neustadt)  
339; house (village, club designs) 564;  
free libraries (Abingdon) 710 (Bodmin)  
634 (Hammersmith, details) 382 (Hyde)  
310 (Liskeard) 238, 257 (Newcastle,  
Stephenson) 130 (Nunhead) 564 (St. Ives)  
634 (Shoreditch, designs) 92, 168 (Shore-  
ditch, Kingsland-road) 858  
Pulley and frame by X photography, 417  
Pulpit, All SS, Chesterfield, 346

**QUEEN** Anne side table, 617  
Queen's hall, Regent-st., plan, 560

**RAILWAY** administrative offices,  
Bombay, 420  
Rathhaus, Lübeck, staircase, to, 710  
Reading, art gallery, public buildings, 382  
Rebus, Shepherd in Bush, Shepherd's Bush  
free library, 382  
Rectory, Eccleston, Chester, 894  
Redfern's premises, Conduit-st., W., 60  
Refectories: Dunfermline abbey, 490;  
Marienburg, 454  
Regent-st., Queen's hall, plan, 560  
Renaissance details: Belgian, 88, 90;  
English, 4, 5, 6, 157, 158, 159; French,  
89, 120, 121, 925  
Reredos, St. Paul's cathedral, 159  
Restaurant fireplace, hotel Cecil, 600  
Restaurants: Holborn, King's hall, 162,  
163; Piccadilly, Prince's, 309, 310  
Restoration of the Marienburg, 454, 471  
Rest, Sailors', Genoa, 276  
Ringers' gallery, Trunch, 420  
Riverside warehouse, E. P. Reynolds'  
design, 238  
Roehampton: house at, 202; porch at the  
Elms, 92  
Roof: decoration, St. Alban's, 420; truss,  
graphic determination of, 56, 222, 231  
Rooms, assembly, 56, 57, 58, 59, 84, 85, 123,  
124, 125, 162, 163, 388, 339, 415, 448, 449,  
560, 561, 706, 707, 742, 743, 811, 812, 813,  
814, 848, 849, 886, 887, 928, 929  
Roost, the, Prestwich, 894  
Rouen, la Grosse Horloge, 925  
Royal: Academy (design for town church,  
T. G. Lucas) 10, 130, 238 (trav. stud.  
drawings, J. S. Stewart) 564, 818; chapel,  
Holyrood, 518; galleries, paintings in  
(Brussels) 420, 490, 672, 818 (Dresden) 92,  
168; institute, British architects (Soane  
design for architects' institute, J. Ander-  
son) 346 (do., do., E. A. Rickards) 454;  
insurance buildings, Liverpool, designs  
(selected, J. F. Doyle) 634 (J. Belcher)  
634, 710; school of art needlework, furni-  
ture at, 858  
Rubens's portrait of Jacqueline van  
Caestre, 672

**SAARBRUCK** casino, 56, 57  
Safety window for lunatic wards, 303  
Sailors' rest, Genoa, 276  
Saint: Anne (church, Wandsworth) 932  
(house and hall, Clapham) 60;  
Anne-on-Sea (St. Thomas' church)  
858; Anselm (Davies-st., W.) 271;  
Barnabas (Morecambe) 868; Bartholo-  
mew (Smithfield, E.C.) 55; Briec  
(Brittany, theatre at) 120; Edmund  
(chapel, Tewkesbury abbey) 60; George's  
Rifles' drill hall, 84, 85; Ives, free  
library, 634; Leonard's-on-Sea, concert  
hall, 560; Magnus (Kirkwall) 490;  
Malrupe (Loch Aoinard, font) 487;  
Margaret (Frizinghall) 526; Martin-in-  
Fields (Trafalgar-sq.) 4; Mary (Banbury)  
600 (Coventry, hall) 564 (Stainburn, W.  
R. Greave's design) 507 (Tenby) 199  
(Woolnoth, E.C.) 54; Mary the Virgin  
(New York, steel framed) 775; Paul  
(Burton, organ) 10; Paul's cathedral  
(reredos) 159; Philip (Southport, schools)  
130; Serf (Dunning, N.B.) 490; Silvestro  
(convent, Genoa, doorway of) 10; Thomas  
(St. Anne's-on-Sea) 858  
Salamanca, Casa de Monterey, 818  
Saloon, grand, Prince's hall, 3, 9, 310  
Savings bank, Glasgow, 168  
Scarborough: Cliff, church on, 634; Park  
lodge, 818  
School of art needlework, furniture at, 858  
Schools: Ambler Thorn (infants' bd.) 490;  
Bristol (Barton-hill, bd.) 43 (Greenbank,  
bd.) 490; Dagenham (bd.) 858; Darenth  
(bd.) 168; Dudding-hill, Wilkesden (bd.,  
W. D. Caroe's design) 382; Halifax,  
Caddyfield (bd.) 327; Hyde (technical)  
310; Leicester (technical and art) 784,  
801; Llanrwst (bd.) 932; North Shields  
(bd.) 727; Nottingham (Meth. Free)  
651; Outlands, Huddersfield (Meth.  
New Con.) 600; Southport (St. Philip)  
130; Swindon (Clarence-st., bd.) 746  
Scotland: ecclesiastical architecture of,  
487, 490; yard, New, police offices, 158  
Screens: Castle Acre, 420; Fife house,  
Whitehall, 5, 6  
Scully sinks, 556, 557  
Sea wall, Sheringham, 147  
Seckford hall, Woodbridge, 238  
Secretaire and armchair, architect's, club  
design, 346  
Sections: automatic flushing chamber, 344;  
bandstand, 276, 346; banks, club designs,  
818, 835; baths (details) 668, 669 (public,  
club designs) 185; casinos (Leipsic) 560  
(Oldenburg) 59 (Saarbruck) 57; cather-  
dral (Kirkwall) 490; churches (Banbury,  
St. Mary) 600 (town, club designs) 276  
(do., T. G. Lucas's R.A. design) 238;  
concert hall (Cologne) 743; cottage,  
gamekeeper's (club) 382; drainpipes, 379,  
380; drill hall (St. George's rifles) 84, 85;  
factory, 741; gullies, 523, 524; intercept-  
ing traps, 491, 485; latrines, 814, 815;  
lavatories, 740; library, free (St. Ives)  
634; manholes, 412, 413, 484; markets  
(Sydney) 92; music-halls (Alhambra) 928  
(Oxford) 929; public-house (club) 564;  
restaurant (King's hall, Holborn) 162,  
163; schools (Leicester, technical and  
art) 801; sinks, 556, 557, 7, 8; soil-pipe,  
451; stables and cowshed, 672, 689;  
traps, drain, 481, 485; urinals, 781, 781;  
ventilation of drains, 329; vestry hall  
(Penge) 448  
Seeley presentation casket, 10  
Shepherd-in-Bush, rebus in Shepherd's  
Bush free library, 382  
Sheringham, cliff protection at, 147  
Shields: North, Coach-lane bd. schools,  
727; South, premises, 255  
Shire hall, Durham, 310  
Shockerwick, Somerset, stables, 710  
Shoes, cast iron for trusses, 838, 839  
Shops, Swansea, 581  
Shoreditch: baths and free library designs:  
Brewill, Bailey, and Mallows, 168;  
Gibson and Russell, 92; Thomas and  
Son, 168; Kingsland-road free library,  
838  
Shrewsbury, old houses, 564  
Shutterwork, Belgian, 507  
Side table, Queen Anne, 617  
Si-na, pavement in cathedral, 818  
Silesian tombs, 634  
Sinks: kitchen and scullery, 556, 557;  
slop, 708  
Sister Dora convalescent hospital, Milford,  
342, 343  
Sketches: Birmingham A.A., 534, 710;  
Pembrokehire, 198, 199, 202  
Skinner's hall staircase, 894  
Slingehand's "Music Lesson Interrupted,"  
92  
Slop-sinks, 708  
Small: bank, club designs, 8, 8, 835; baths,  
club designs, 185; house, drainage plan,  
197; town hall, club designs, 276  
Smithfield, West, St. Bartholomew's  
church, 55  
Soane designs, institute of architects: J.  
Anderson, 346; E. A. Rickards, 454  
Soil pipe section, 451  
South: Kensington museum (Mackenzie's  
Lincoln cathedral) 346 (Powell's  
Worcester cathedral) 238; London art  
gallery, 526; Sea house, Flamborough,  
310; Shields, premises, 255  
Southport, St. Philip's schools, 130  
Spire, steel, construction interior, 526  
Spitalfields, Christ church interior, 526  
Stables and cowshed, club designs, 672,  
689; Norfolk, 710; Shockerwick, Some-  
set, 710  
Stainburn, W. R. Greave's design for St.  
Mary's Church, 57  
Staircase: balustrades, cast iron, 293;  
construction, 374, 375  
Staircases: club-house (Philadelphia,  
Univ.) 420; house (Brighton) 202  
(Chicago) 420 (Haverfordwest) 202;  
museum (Antwerp, Plantin) 746; palace  
of justice (Brussels) 88; rath-haus  
(Lübeck) 710; Skinner's hall, 894  
Station, police (Newcastle-on-Tyne) 92  
Steel: bridges, designing of, 53, 54, 165,  
166, 340, 522, 702, 716; framed church in  
New York, 775; spire construction, 926  
Steele's door fastener, 235  
Stephenson library, Newcastle-on-Tyne, 130  
Steps, development of, 375  
Steward's house in Norfolk, 710  
Stone-cutting and masonry, 374, 375, 377,  
378  
Strand, the: hotel Cecil, 416, 600; Somer-  
set house, 4, 5; to Holborn improvement  
scheme, 394  
Strasburg, concert hall plans, 813, 814  
Stresses, graphic determination of, in  
collar-beam truss, 56, 222, 231  
Studentship drawings, R.A. (J. S. Stewart)  
564, 818  
Stuttgart: King's-building, 811, 812;  
Liederhalle, 703  
Suffolk, Duchess of, Holbein's portrait of,  
600  
Surface gullies, 523, 524  
Surrey, dining-room, house in, 588  
Sutton Coldfield, house at, 363  
Swanage: Congregational church, 420;  
house at, 818  
Swanscombe, All Saints church, 10  
Swansea, shops in Waterloo-st., 581  
Swindon, Clarence-st. board school, 746  
Sweeney city markets, 92  
Synagogue, Hammersmith, 746

**TABLES:** communion (Beith ch.) 875;  
lacier, 617; Norwegian, quaint, 420;  
side, Queen Anne, 617; writing, 109  
Tablet, Hammersmith free library, 382  
Technical schools: Hyde, 310; Leicester,  
784, 801  
Tel-tale, boiler, 168  
Tenby: ancient treasury, 199; chancel,  
St. Mary's, 199  
Teutonic order, architecture of, at Marien-  
burg, 454, 471  
Tewkesbury abbey, St. Edmund's cha-el  
and south aisle, 60  
Theatres: Brussels, Flemish (plans) 887;  
Islington, Grand (plans) 849; St. Briec,  
120  
Thornton house, Wirral, 526  
Timber framing and brickwork, 620  
Tombs: Canterbury cathedral (Hales) 130;  
Edinburgh (Greyfriars churchyard) 519;  
Hirschberg, Silesia (Hess, Kosche, Titze,  
and von Schweinichen) 634  
Town churches: large, R.A. design (T. G.  
Lucas) 10, 130, 238; small, club designs,  
276  
Town halls: Hunstanton, 526; Lübeck,  
staircase, 710; Lynn, 781  
Trafalgar-square, St. Martin's church, 4  
Trap, drain cleaning, 854  
Traps, drain, 484, 485  
Travelling studentship drawings, R.A. (J.  
S. Stewart) 564, 818  
Treasury of Tenby church, 199  
Trinity court, Boston, Mass., 891  
Trough-closets and latrines, 814, 815  
Trunch church, ringers' gallery, 420  
Truss: collar-beam, stresses in, 56, 222, 231;  
King-post, 620, 693

**UNIVERSITY:** club-house, Phila-  
delphia, 238 (staircase) 420; college  
hospital, proposed re-construction, 672  
Urinals, details of, 780, 781  
Uxbridge-road public library, details, 382

**VAN:** Heythuysen, W., Hals' portrait  
of, 420; Orley, a Pieta by, 490  
Vanity Fair, Christian and Faithful in, 10  
Venetian paintings, 168  
Ventilation of drains, 329  
Vestry hall, Penge, 448  
Vienna: Adelige's casino, 57, 58; concert  
hall in Stadgarten, 812; musical union,  
706, 707  
Village public-house, club designs, 564  
Volunteers' drill hall (St. George) 84, 85

**WALL,** sea, Sheringham, 147  
Walmgate bar, York, 543  
Wand-writh, add-ions to St. Anne's  
church, 932  
Warehouses: Manchester, 490; riverside,  
E. P. Reynolds' design, 238  
Warming buildings by hot water, 858, 915,  
924  
Warwick-lane, E.C., Cutlers' hall, 382  
Warrickshire, o.d., half-timbered house  
in, 710  
Waste-preventing cisterns, 597, 593  
Water colours, English, S. K. M., 233, 346  
Westminster Bridge-road, Dover Castle  
hotel, 763  
Whitehall, details from Fife house, 5, 6  
Whitmore, Staff, a Maer hall, 746  
William III. elbow chair, 617  
Wilkesden, Dudding-hill bd schools, W. D.  
Caroe's design, 382  
Windermere house, Blackheath, 746  
Window, safety, for lunatic wards, 303  
Windsor Castle, Holbein's portra ts, 276, 600  
Wokingham, almshouses, 5  
Woolstanton, Wesleyan church, 526  
Woodbridge, Seckford hall, 238  
Woodwork, French carved, 803  
Worcester cathedral, by J. Powell, 238  
Workhouse, Mildenhall, 346  
Writing table, 109  
**X** ray photography, pulley by, 417  
**Y.M.C.A.** premises, Newcastle-on-Tyne,  
894  
York, city bars, 513



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

### WORK FOR THE NEW YEAR.

EVERY architect is, or ought to be, concerned with two sorts of work. There is, first, that which he does by himself—the design of his own buildings and details. Nobody can help him much here; though if he has a meddlesome client or an interfering partner, he soon finds that somebody can effectually hinder him. Then there is that which he does in common with his fellow professionals, or, if the title is preferred, his fellow artists. In this case, however, the former word is likely to be the truer one. Unhappily, for the present, it is rather matters of business than matters of art which call upon architects to act together. Some help of the higher kind they may doubtless give each other by suggestion and criticism, and the mutual communication of knowledge; but their main reason for standing shoulder to shoulder is to get fair-play all round, and to prevent architecture and its producers from being thrust headlong out of a world in which the things of the mind are always at a discount when compared with the things of the body.

Inevitably an architect's personal work is the main consideration, and the great question is not as to its quantity, but its quality. Many a man has lined his own pockets and feathered his own nest by turning out a series of buildings which disgraced his age and his country. "There is very little money to be got honestly," as a thief lately pleaded before a magistrate in excuse for his doings. Certainly there is very little to be got artistically in our own profession, except by an architect who is lucky enough to find clients of quite exceptional taste and education. People of a lower grade do not want architecture. The surveyor-of-all-work is good enough for them. He believes, as they do, that "the worth of everything is just as much as it will bring," and they can thus meet him on common ground, and recognise him as a man and a brother. If we add to this enormous advantage that which results from the said surveyor's business talents—in other words, from his faculty for pushing and toting and elbowing himself in—we see clearly enough why most modern streets are the horrors they are, and why the last man to get a large practice is generally the man who deserves it most. And if we look one stage further, and note that three times out of four it is the men with large practices who get the uppermost seats in our architectural synagogue, and become presidents and vice-presidents and "persons of high standing," we begin to understand why competitions are apt to turn out as badly when there is "an assessor of high standing" as when lay committees manage them from beginning to end by themselves.

This matter of competitions is one of those which are down again for consideration in the near future. The Institute has taken it up once more, and presumably has it now in hand. As Mr. Gladstone lately remarked about a more important question, it "only needs common sense to settle it." But when such a question comes up for settlement, as this seems to have done, before a body largely composed of the very "assessors of high standing" of whom the majority have made such a terrible mess of it, it is natural that our fears for the result should somewhat overshadow our hopes. With one or two brilliant exceptions, they have shown by their decisions that common sense is a quality they are a little deficient in, while some of them are scarcely better furnished with good taste and even with ordinary fairness. It is not, of course, that there is anything like intentional dishonesty amongst them. What happens much oftener is something of this sort. The lay promoters—the board or committee who initiate the competition—start the game by issuing an impossible set of "conditions." Turned into plain English, they amount to this: that the promoters want, say, £20,000 worth of buildings, and that they insist on paying only £15,000 for them. Of course, they do not put it in this barefaced way; but they know perfectly well that this is what they are demanding, and the assessor, when appointed, knows it, too. We may presume that he was no party to the issue of such "conditions." If he was, he should be marked down, thenceforth and for ever, as unfit for any future assessorship. But more probably he was invited to act long after the "conditions" had been sent out, and after the designs, which by a grim joke affected to comply with them, had been sent in. Before he accepted the invitation, he ought to have studied the "conditions." Had he done so, he would have seen that they were impracticable. As a man of the world, he would have known what impracticable "conditions" lead to. At best, they result in undeserved disgrace to the architect who is appointed. "We told you," every cantankerous member of the committee can always say to him, "that our buildings must not cost more than £15,000, and here you have landed us in an outlay of £20,000 at the very least. That shows how much you are to be depended on." Next, the assessor would have known that impracticable "conditions" do even more, and give the profession a bad name with the public. Mr. Scrooge, the chairman of the Chiseldon committee, meets Mr. Marley, who adorns the Starveall board, and Sir Giles Overreach, the great man of Grabington. They discuss their architects together. Scrooge relates how his friends were "let in" for £5,000 more than they

expected; Marley tells a similar tale; and Sir Giles supplies a climax from what he knows of the contract and extras for the new workhouse in his own locality. "And there is no excuse," he adds, "for any one of these architects. All the designs were selected in competition, and in each competition the architects were told in plain words how much money was to be laid out. But they are all alike, and not one of them is to be trusted." Talk like this goes on all over the country. There is an everlasting throwing of mud, and some of it sticks; and it is assessors "of high standing" who, by acting as such, do more than anybody else to make this mud-throwing possible.

Every honourable architect, whether of higher or lower standing, should refuse to act where there are such "conditions." He should practically say to the promoters, "You have got yourselves into this mess, and may get yourselves out. You have done, or tried to do, a dishonest thing, and I shall not lend my reputation to shelter you. You knew that the amount of work you asked for could not be done for anything like the sum of money you named. But you would like me to act as assessor, and to say that it can: that Brown's, or Jones's, or Robinson's design, which gives you the £20,000 worth of buildings you want, can be built for the £15,000 you offer. I know it cannot; therefore, with many thanks, I decline your invitation." If the "architects of high standing" who are so ready to impose themselves on us as guides and philosophers, if not as friends, had the manliness a little oftener thus to decline all contact with a dirty piece of business, we should respect them more, and the public would respect us all more. But what some of them do is rather this: they try to effect a compromise between what the committee want and what they offer. If the promoters insisted on a town hall, for instance, 6,000ft. in area, as one of the things to be had for their £15,000, an assessor of this type will search through all the designs till he finds one, no matter how unsuitable and how bad, which only contains some 5,000ft. If the rest of the accommodation in it also proves to be considerably below the mark of the "conditions," the assessor pitches on this design for better, for worse, and gives it the first premium. Perhaps the committee build it. Then they fail, on one hand, to get the space they required, and, on the other hand, to keep within the sum they named. They are rightly served, no doubt; but what is their opinion of the assessor? We may judge what it is from the action of the next competition committee in their district, who take good care that their assessor's reward shall influence them in nothing whatever but the payment of the premium.



Such facts as these, which are familiar enough to every competitor, clearly indicate a few urgently-needed reforms in the assessorship system. The Institute at present "advises" that the assessor should be appointed at the very onset of a competition, and that the conditions should be settled from the first with his approval. It is quite time that the Institute not merely advised this, but insisted on it. If the assessor is not appointed at the very beginning, every man with any respect for himself or his fellows should decline to act in that capacity at all, since, if he acts, he is almost certain to make himself a party to very shady transactions. The lions in the way, when this straightforward course is adopted, will turn out, on a near approach, to be only imaginary ones. For instance, we are told that if the assessor's name is known from the first, every competitor will try to ape his ideas and copy his style. Well, as to style, few architects of any eminence are now so much wedded to any one in particular, that they would be likely to reject good work in any other, be it what it might. As to pet ideas, we may remind the timorous on this score of Mr. Waterhouse's remarks on the Sheffield competition, which he decided. Partly, as he was courteous enough to suggest, on account of a similarity in the form of the site, he could not help observing (as others could not, either) a special resemblance between many of the plans submitted and that of a certain town hall at Manchester, with which, a good many years before, he had been rather intimately concerned. But Mr. Waterhouse did not thereupon, as on our timorous friends' theory he should have done, select the five or ten plans most like his own, to compete again for the final result, and send home the others in disgrace. And it would be most unlikely that any competent assessor would do so in any case. Imitation may be the sincerest flattery, but it is a sort of flattery with which a sensible man is soon disgusted; and his self-esteem must be far above the average if he could be tempted to reward feeble copies of his own work in place of able and original inventions. The objections to appointing the assessor at the very outset are not worth balancing for a moment against the advantages of it, and if architects are ever to be "freed from the littan'd scorn" which marks out their estimates as unworthy of trust, assessors must firmly refuse to act where they have had no original control of the competition "conditions."

That is one reform, and it will be well for us all if this new year does not end without it. But there is another one equally urgent. If no assessor, as we have been trying to show, should help to saddle a brother architect with the responsibility to get £20,000 worth of building done for £15,000, no assessor, either, should undertake to pick out the best design for a particular purpose unless he well knows everything which that purpose requires. It is amazing with what a light heart some men will undertake a task of this sort, for which, one would suppose, they must be well aware they are unfit. We have known a Roman Catholic architect accept the position of assessor in a competition for a Baptist chapel, and should like to know what he would have thought if a Baptist had done as much for a Catholic church. An authority on ancient lights has sometimes been appointed to select a design for a Board school, and has shown his ignorance of modern ones by taking a plan with the windows in the wrong place. Some assessors go in for convenience without art; but quite as many are no better judges of the useful than the beautiful. At least, this is so outside their own special field of study. Next in importance to the principle that the assessor should be appointed at the very outset, or not at all, is the other principle that he should be a

specialist in the class of work he is called in to arbitrate about. The neglect of the first rule leads to three-fourths of a committee's complaints about their architect. The neglect of the second one results in their refusal to carry out the design their assessor has selected—a refusal which may arise from other and less creditable causes, but which often springs from an honest perception that the assessor does not know the practical necessities of their building as well as they do. Some architects seem to fancy that an assessor's decision can, at some future time, be made binding on any committee which employs him. In the majority of cases this is never likely to happen, and, even if it could be brought about, the results, while assessors are appointed in the present haphazard way, would often be lamentable. Where the assessor obviously knows his business, his award will carry weight; but it will not do this while he is a mere "man of high standing," set up, as often as not, to decide about classes of building of which he has no special knowledge whatever.

The settlement of one great matter is considered a fair Session's work for the two Houses of Parliament, and the year now begun would be well spent by our architectural parliaments if they could only deal effectually with the one burning question of competitions. But they have other subjects, too, before them, though we have hardly room to-day even to name them. There is the question of the appointment of Fellows of the Institute, as to which we reported some months ago a meeting of many gentlemen who were interested—a question which is soon likely to enter on another stage. One proposal is that, with the exception of outside architects who have produced satisfactory work, no one but Associates should in future be eligible for Fellowships. The proposal is well intended, and points in the right direction. But, to all appearance, its final result would be to cast a slur on those members who have belonged to the Institute from the first, and to give outsiders an advantage over them. When the system had come into full work—say, 20 years hence—any client who wanted to ascertain the standing of an architect might be sadly misled. He would take the Institute "Kalendar," and look at the names and dates of the three or four Fellows he was trying to decide between. He would find "A., Associate 1890, Fellow 1898; B., Associate 1901, Fellow 1910; C., Associate 1895, Fellow 1904"; and he would say, "That proves nothing. Having been Associates, they became Fellows as a matter of course." By-and-by he would come to H., Fellow 1909, and never an Associate at all. "Ah," he would say, "here is a man who did not come in by mere seniority. If he had not done good work he would never have been elected. That is the sort of architect I am looking for." To set up such an invidious and often quite fallacious test is the last thing that any of us would desire, and whatever changes may be made, the risk of doing it should be borne in mind. If there is to be a change, as there are many reasons for thinking that there ought to be, should it not rather go on the same principle as the changes of late years with regard to the Associateship, the principle of making entrance to the Institute not easier, but harder? It is difficulty, not ease, which attracts candidates, for where there is no difficulty there is no distinction to be gained.

#### ARCHITECTURAL PROGRESS.

TAKING a glance at a few of the topics which have engaged the attention of the profession during the last year, we cannot forbear to notice two or three which have exercised some influence in the building world. The passing of the new London Building Act is in itself an important

event, not only as being likely to modify very considerably the building operations in the Metropolis, but for the number of interested people who had a finger in the pie. Many of the clauses, as we have lately said, have been weakened in their effect by amendments incorporated with the original draft; the consequence of which is that, in a few important provisions which were intended by their framers to improve the existing condition of buildings, the courts of law have decided points in a sense quite different to that contemplated. Other sections, like those relating to courts within buildings, open spaces behind buildings, height of buildings, &c., ought to operate in doing away with overcrowding and other glaring evils which have been permitted; but they are at present passing through a tentative stage, and their vagueness will, we think, leave much to be settled by the Tribunal of Appeal. As to some of these clauses we naturally inquire whether they have really simplified the previous Acts. Perhaps the most useful of the provisions of the new Act are those referring to the widening, altering, and improving of streets. The requirements of Michael Angelo Taylor's Act and other Metropolis Management Acts are provided for, and new power is given to the L.C.C. to make by-laws to regulate projections over streets, such as lamps. Unfortunately for the Act, its details have been considerably tampered with by various bodies in the passage of the Bill through Committee, with the result that many of the sections will have to be redrafted.

Architects and the public will be affected by two measures for which the L.C.C. have deposited Bills in Parliament: these deal with general powers and tramways. The first empowers the Council to purchase lands for various objects for approaches to Lambeth and Wandsworth bridges, for the purchase of land at Streatham and Shepherd's Bush. By this Bill the Council can enter upon property for survey and valuation, stop up ways, and make other changes of a sanitary kind. The owners of property and architects will do wisely to take note of these proposals. Again, the subject of building contracts has received special attention at the hands of architectural bodies. The Institute schedule which was published during the year has not met with very general approval amongst builders. Questions of variation, extras, appointment of arbitrator, have been discussed on both sides, and the meetings lately held of the Glasgow Building Trades Exchange prove that there is something to be done to make these conditions of contract less exacting on the contractor. Architects will be wise if they follow the recommendations of Mr. R. Scott on this question—viz., Be more careful in preparing contract drawings, that they may give a true idea of the nature and extent of the work; and in the detail-drawings furnished during the progress of the building take care that they are only developments of the original plans—not, as they often are, something very different and more elaborate, having little relation to the original design. The power given to architects to make alterations is often unduly exercised by them; the clause is usually very elastic, and permits almost any deviation to be made.

That we have made any real progress in architectural design will be doubted by many who have the settled conviction that all "art" during the last three hundred years has been a perversion of its true functions. We acknowledge there is much truth in this view, though it would be equally wrong to deny that a truer feeling for art has become evident; that our leading architects have reached the point where a future development upon the lines of the old work may be expected. For the last thirty years at least the more thoughtful and advanced among them have been eliminating the abuses



which have crept into modern architecture during the long period of the sway of purists and archaeological revivalists. Literal copyism of old work is now condemned or left to a few of the survivors of Classic or Gothic, and we have in its place an honest and truthful evolution going on, in which the more permanent elements of our national architecture are being embodied in our buildings. Concurrently with this movement is the progress made in structural science, improvements in building construction, new materials and manufactures. To a very large extent this has been a distinct and separate development from that of the artistic evolution. We may, in fact, say that our building science and mechanical improvements have outrun our architecture, are pursuing distinct paths, and have sometimes been in conflict with it, and that it will be some time before the two are brought into a harmonious relation with each other. Compromises on each side will have to be made, and this will only take place when the architect begins to understand the constructor and the specialist, and when the latter is equally disposed to learn the history of art and accept its teachings. The advance in science and technical instruction has somewhat widened the breach between architecture and the mechanical branches and handicrafts, as they are at present understood. Very little sympathy exists between them, and this is one of the new problems which architects have to face in the future—how they can maintain their claim over the handicraft arts and trades, which are becoming more and more independent of the architect's control? When once this reorganisation between art and handicraft is re-established, we may expect more rapid progress; but the time is not yet—the problem is one that awaits solution. It is one between architects and craftsmen, capitalists and labourers, in a far deeper sense than we imagine. Each is working for himself, and neglects the others. The architect is contented to stay in his office and look after his clients; he has no desire to take into his confidence the builder or the workman. The workman, on his part, is satisfied to get through his labour as easily and thoughtlessly as possible. The capitalist regards only the return in the shape of interest for capital invested; in short, the brain and hand-producing powers are disorganised, and under a great monopoly—those who can employ them and make a profit by them.

The schools of applied art—such as those at Liverpool—are institutions doing an immense amount of serviceable work. Their pupils are instructed in elementary practical knowledge of handicrafts involved in construction and in the arts of design; but they are at present in the experimental stage. We have no positive assurance that they will take the place of the apprenticeship system, which has worked so well for generations. The question is: Will the working classes, the youths intending to follow the handicrafts, avail themselves of these technical institutes? How many of those who attend the classes and laboratories belong to the crafts or are in builders' employ? As yet we are not in a position to answer these questions. The report we recently referred to on "Apprenticeship in the London Building Trades" of the Technical Education Board showed how few apprentices there are among the London building firms, the large majority "picking up" their respective trades. Some of the leading firms speak very discouragingly of technical schools and classes: they say the instruction is too flimsy and too much in the nature of an exercise or recreation; that there is no reality "about the work such as is obtained in the shop or on the job"; the instructors are "rarely sound practical men," and so on. Others say that technical instruction assists by supplementing the apprenticeship and giving instruction in subjects which cannot be imparted

in the shops, such as plane and solid geometry, drawing, instruction in the use of materials, mechanical principles of construction, &c. The evidence given as to the chief trades, as those of the carpenter and mason, is conclusive of these views that no school education can take the place of the workshop, and that in some trades the practical side can scarcely be touched in the technical school, however well equipped its workshops may be.

Leaders of architectural thought have not been slow in pointing out that the modern architect also is working under conditions very different to those of the past. He designs and works under restrictions unknown to the architects of the best periods: while the modern buildings are designed on paper, the ancient were thought out in the real materials. Mr. Jackson lately spoke of the advantages of the ancient method compared with the modern, that "success in architecture, sculpture, and the applied arts depends on the right treatment of material no less than on brilliancy of design." Material must be used to the greatest economical advantage, and design must express the natural properties of each so clearly that it would lose its charm if translated into a different material. Till these fundamental facts are grasped all architectural education will be ill-directed and worthless.

Both on the trade and professional sides we are met with the idea of co-operative movement. Even competition is passing through a phase—it is no longer one of mere strength and tact, but of ability and education: the man who can do his best, not he who can outdo another for the sake of competition in the sense of rivalry. The handicraft ideal of architecture is a new force we have to reckon with. In the more professional sense, architecture has been seen to be more or less of a failure—a striving to obtain a position or emoluments or a name, without a corresponding degree of ability and true architectural aims. The air is full of remedial measures—shibboleths some of them may appear to be—but still ideals born of a true faith in the Nemesis of all wrongs, in the justification of art for its own sake. When we have our municipal workshops, our handicrafts brought within reach of the architectural student, a system of production and distribution instead of the wasteful expenditure of unrequited talent in competition, and for the advantage of capitalists only, we may begin to realise better than we do now the results of those movements to which we have been drawing the attention of our readers.

#### ART IN BRICKWORK.

AS in every other trade connected with building, a method or art is necessary in the execution. Nowadays, owing to modern conditions of building, there is a temptation to adopt tentative and rule-of-thumb methods, not to trouble too much about the approved ways of executing work. In brickwork this tendency is very much seen; there is an immense amount of scamped work done due to the demand for cheap houses, and the employment as a result of bricklayers' labourers in place of skilled artificers. Probably in no other trade do we find so many opportunities for inferior hands to enter. The man who has been employed to do rough interior walling, the labourer who has picked up his trade, the mere jobber, has each a chance of dubbing himself a "bricklayer" and obtaining work, to the injury of the trained workman. Mr. John Toomey's paper on the subject of brickwork at the Architectural Association, a full report of which we gave in our last issue, deals with a few of the points about which there is much difference of opinion. As to materials, no one denies the value of using clean, sharp sand, though in practice, the expense of washing or of obtaining sharp and clean sand makes

this requirement almost a dead-letter. The repeated summoning of builders before the magistrate, under the building by-laws in force in London and other places, for the use of bad sand and mortar, shows with what persistency the ordinary builder tries to shirk his duty. The expert evidence produced in these cases proves that road-scrappings, mud, and dust are used by the ordinary jerry builder; or the specimens produced have been found to be mixed with loam, burnt clay, and other impurities. If the clay is thoroughly burnt and mixed with real sharp sand or clean road-sweepings, the mischief would not be so great, and in some parts of the country washed road-sweepings from gritty roads make a very hard mortar. No doubt the temptation is to use the most abundant material to hand, and the natural soil of the district is too frequently relied upon where good sand is not easily procurable. It would be safer to use coal cinders, broken brick clinker, or slag properly ground, and, as Mr. Toomey says, the clinkers from a dust destructor, mixed in proper quantities with sand and lime in a mortar-mill, make a good mortar; but the over-grinding of mortar in mills is a fault to be avoided, and bricklayers prefer hand-made mortar. We may refer our readers to an article in our last issue entitled, "Size of Grains of Sand in Cement," which describes some important experiments in the United States, from which it will be seen that coarse sands are better than fine sands for cement mortar.

Alluding to bricks, the lecturer endorsed the opinions of most architects who know anything of brickwork, that "shippers" and red "sand" bricks are harder and better in colour than the ordinary "pressed" or wire-cut bricks. These last indeed possessed the merit of being squarer, and having sharper arrises, and were uniform in size—advantages no doubt; but the face of the pressed brick often peels off in some situations. For regular, even-coursed work they are preferred by many architects, who look to this quality rather than to durability and variety of colour. There are many excellent bricks in the market, such as the Fareham reds, the Fletton, common pressed and white facings, and red hand-made facers. Some of these, as the well-known T.L.B. hand-made and pressed red facing bricks, have all the quality of sand-faced bricks, and are square and regular. It is rather, however, of the modes of executing brickwork that we now speak, and here we may object to the common mode of building piers to suit openings shown on plan or elevation, instead of to suit the bond—a point referred to by Alderman H. R. Taylor in the discussion. The consequence of this method of working is detrimental to sound work, as it necessitates the use of bats and broken bond. The sizes of piers and openings ought to be regulated by the bond even if a few inches more or less are required in the pier, and this ought to be thought of by architects in making their contract drawings or in figuring them; but how few do so? The conditions of modern work are prejudicial, no doubt, to correct and sound workmanship. For instance, it is very common to find walls carried up in pieces or in sections between stanchions or openings without any reference to the bonding of the work; vertical toothings are left between old and new work to expedite the building, especially in party and external walls. These expedients are prejudicial to good work and occasion unequal settlements and fractures. As to another important point, that of jointing, the discussion did not lead to any definite expression of opinion. "Struck" work has the merit of being an honest and genuine mode of jointing, for the work is "struck" as it goes up, whereas in the modern "pointing" system the work is done by another hand. The general opinion



among architects is in favour of wide joints, such as are to be found in the old English examples of brickwork, with small or thin bricks, and it is this class of workmanship we should like to see more generally used. The tendency of the present time seems to be to use "pressed" bricks of uniform and large size and squareness, to favour thin joints and pointing, a mode of practice which has been introduced by the Queen Anne revivalist. If we look at any examples of red brickwork in London or elsewhere—say, the new brick and terracotta offices and premises in Arundel and adjacent streets—we may judge for ourselves the difference made by these details. The well "struck" joint, with its upper edge pressed by the trowel so as to form a weathered surface, protects the mortar from the weather, and as a sharp shadow is cast below the upper edge, it gives a neat appearance to the brickwork. It is, moreover, an honest joint, which "tuck" pointing is not; any little irregularity in the sizes of the bricks is not observed, and there is not that painfully mechanical and artificial look about the struck joint which is seen in "pointing." The texture and slight unevenness of surface of the best stock facings are also improved by this mode of jointing. Greater breadth is imparted to the wall than in the case of pointing; the work looks more solid and homogeneous. The tuck-pointed joint composed of white-lime putty in straight lines, in the centre of the real mortar joint, gives to the work a rigidity of effect which is anything but true and natural, as the joints are wide and raked out, coloured with a pigment to hide the edges of the bricks before the putty-joint is pressed in. The kind of brick used also makes a difference in the appearance. Good stock or "shippers" give a variety of colour, and their uneven surface adds a charm to the work; the dead-flat appearance and evenness of some of the pressed bricks are anything but effective in a dull, smoky atmosphere. Nor can anything be more offensively monotonous than the dull dead yellow of the malms so commonly seen in the London fronts, which, in the course of a few years, wear a dirty dingy hue. The Fareham red bricks are a decided relief, and we should like to see more of them in our London and suburban buildings.

#### DESTRUCTIVE RESTORATIONS AT OLD CAIRO.

MR. SOMERS CLARKE, F.S.A., writes to the *Times* suggesting that Egyptologists would do well to devote some attention to the Coptic and Saracenic monuments of the Delta, and especially to the ancient fortress of "Babylon" at Old Cairo, now called Kasr-es-Shammah. This structure is the most majestic monument of the Roman occupation of Egypt, and was, until a few years since, one of the most perfect specimens of Roman military architecture. Within its walls are seven churches, the most ancient being known as Al Muallakah, or "the suspended," from the fact that it is built on the top of part of the ancient fortress. On another tower is the Greek Church. The exterior of the fortress is most impressive. A gateway surmounted by a pediment, and built in that large and massive way so characteristic of Roman work, is flanked on either hand by two vast rounded bastions. The walls of masonry, coursed with brickwork in the true Roman manner, were flanked by other bastions of equal size, whilst two circular towers, not less than 100ft. in diameter, dominated other parts of the structure. Mr. Somers Clarke adds that a Coptic gentleman of means has repaired, or, rather, restored to death, the Church of Al Muallakah. The bastions one by one are also disappearing. During the year 1893 the great angle bastion was pulled down, and a white house stands in its place. The wall connecting this bastion with the round tower of 100ft. diameter has also been for the most part destroyed and modern buildings set up in its place, and the writer fears that it is intended to sweep away the remains of the round tower of 100ft. diameter, the internal construction of



ST. MARTIN-IN-THE-FIELDS, TRAFALGAR SQUARE.

which is remarkable. In the last summer the west bastion, flanking the Roman gateway, has been for the most part demolished, and a new structure is to be built on what is left.

In order that a record might be preserved of Kasr-es-Shammah as it now stands, Mr. Somers Clarke has had some photographs of the walls taken, and these are to be seen in the Fine Art Society's rooms in New Bond-street.

detail. It was a long period of copyism, generally slavish and dull; but even when showing signs of genius, still copyism all the same.

In the earlier years of the century all the best buildings fell to Wren's pupils to execute, and their work was a more or less faithful reproduction of Wren's, often of great excellence certainly, but with nothing calling for notice here. The church of St. Martin-in-the-Fields



SOMERSET HOUSE: COURTYARD FRONT.

#### CLASSIC DETAILS AND THEIR APPLICATION.\*

By G. A. T. MIDDLETON.

XXIII.—ENGLISH RENAISSANCE: THE XVIIITH. CENTURY.

ALTHOUGH many buildings of importance were erected in England during the 18th century, there was but little development of

is illustrated, and is typical of what was being done—handsome, worthy of its fine position, but containing nothing fresh in detail to which attention need be drawn.

But as Wren's immediate pupils died, their place was taken by others less directly influenced by the great master, who, though still working in a severely Classic manner, separated into three main groups. One of these groups, with Chambers for the leader, followed the Venetian

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SOMERSET HOUSE (FROM THE OFFICE OF THE "BUILDING NEWS").

Renaissance of Palladio without development, but producing buildings of a highly cultivated character, void of offence and carefully thought out. Such is Somerset House, for example, with its fine entrance and grand courtyard, but yet with nothing fresh whatever in its treatment.

It seems a pity to pass over such noble work in this cursory fashion, yet it would be unprofitable to author and reader alike to give diagrams and descriptions of Orders and ornaments at length

Towards the end of the 18th century there arose the purely Classic school, upon the publication of Stuart's "Antiquities of Athens." There was for a time a craze for the purely Greek in design and detail; but again there is little fresh to learn from the many fine buildings which were erected, several within the memory of living men, including the greatest of all, St. George's Hall at Liverpool. This modern Classic school, if it be taken to include the Roman as well as the



ALMSHOUSES AT WOKINGHAM.

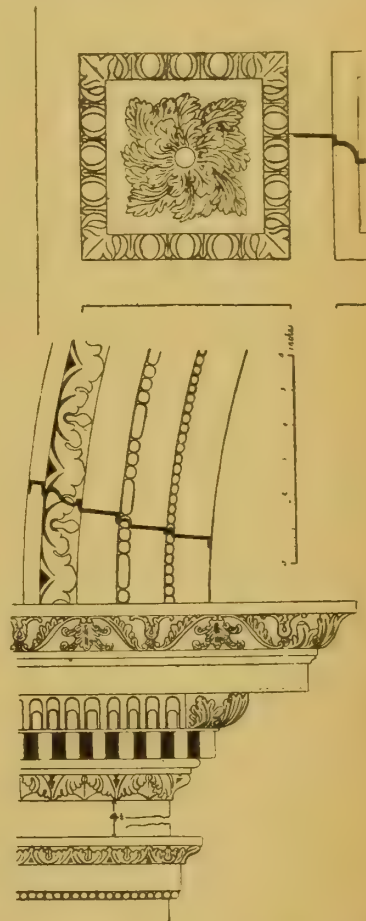
which have already been illustrated in earlier instalments of this series.

This same remark applies to all the subsequent work of the same school, even to the great club-houses built this century, which, though frequently, if not almost invariably, buildings of an exceedingly high order, most rarely possess anything fresh or worth recording. They might just as well, save that they are more easily seen and studied, be Palaces in Florence or in Venice for all that can be learnt from them.

purely Greek, comprises very much indeed of the more notable work of the end of the last century and the first forty or fifty years of this; but it is all tainted in the same way: it is devoid of originality or of growth, and is a mere transplantation of work which better suited other lands and other people. Even Newgate Gaol and the Bank of England, original in so far as they were adaptations to peculiar circumstances, must really come under the same category.

The exceptions are the works of the third and

contemporary school, that of the Brothers Adam, confined almost to themselves. The originality they displayed was just that which signifies true growth and development, being in no degree strikingly eccentric, but dependent upon a tasteful appreciation of proportion, with the introduction of much fine detail suitable to the comparatively small buildings on which they were engaged. The illustration given, though Fife House is not known to have been theirs, is fairly typical of the work they did. There is considerable, judged by previous experience, curiously placed entasis to the columns; the capitals are very high, but so well undercut and delicately modelled as to take away all impression of heaviness; the cornice is widely projecting upon a deep bed-mould, all finely enriched, and of carefully-devised contours; and the arch is but



Impost, Arch Enrichment, and Soffit Panel of Pinewood Screen from Fife House, Whitehall.

slightly marked in elevation, though well coffered on soffit, and the spandrels are filled with swags and drooping bunches of tiny flowers.

Here at length there is a lesson to be learnt: that even in these late days of the Renaissance in England there was still the possibility of development of detail suited to its purpose upon true Classic lines.

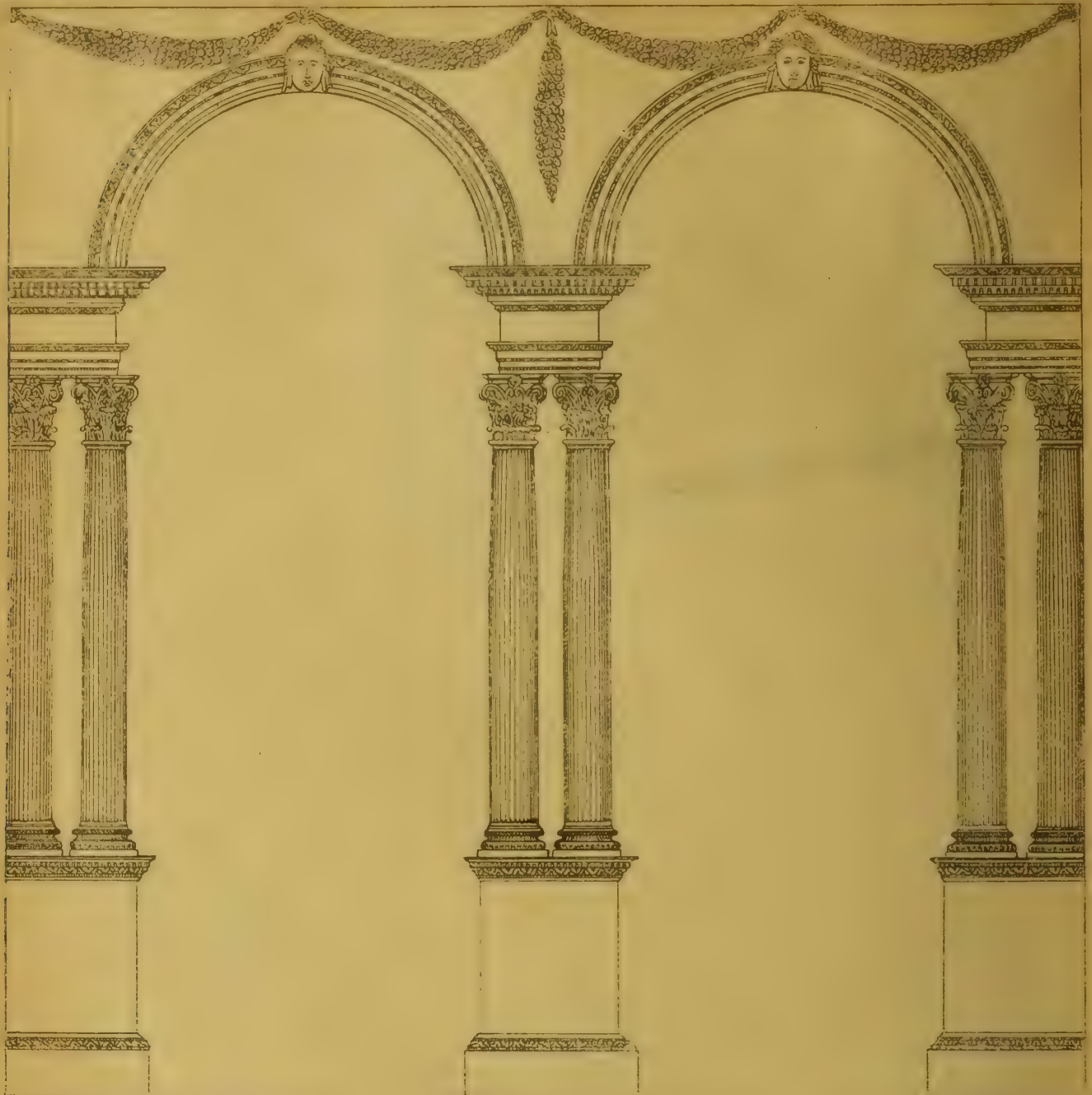
In contra-distinction to these greater works, there was contemporaneously existent in England throughout the whole of the 18th century a special description or class of brick domestic building, to which the name of "Georgian" has been given. The principal characteristic is simplicity—many people would say almost to ugliness; but the use of a strong cornice, and the emphasising of prominent features, such as doorways, add a note of dignity and an impression of substantiality which are solid and pleasing, and English without. The almshouses at Wokingham are just ordinary examples, such as one meets with in almost every country town—just comfortable, simple, homely buildings in which to rest content when the stress and storm of active life are over.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XII.

By JOSEPH HORNER.

A STUDY of the foregoing articles—which, it will have been observed, are written entirely from the practical standpoint—will enable





12 9 6 3 0 1 2 3 4 5 6 feet.  
SCALE.

PINEWOOD SCREEN FROM FIFE HOUSE, WHITEHALL. (NOW IN SOUTH KENSINGTON MUSEUM)

[See Article, "Classic Details and their Application," on previous page.]

us now to understand what are the elements of strength and of weakness in each class of work. We are also now able to take a rapid survey of the classes of work for which cast iron is eminently adapted.

Cast iron, in my opinion, exemplifies the old adage, "Give a dog a bad name, and hang him." Because the material has failed under certain circumstances, it has been generally condemned as unfit for many purposes for which it is eminently adapted. The same distortion of judgment, if applied to other material, would condemn it also. Even mild steel, the use of which has so largely taken the place of many other materials, gave an infinite amount of trouble for many years after its introduction. It failed in many instances, and the older engineers, accustomed to the use of wrought iron, shook their heads, and would have little to do with the new material. But a school of scientific engineers had arisen, who, discarding rule-of-thumb methods, acquired, as the result of many thousands of experiments, so intimate an acquaintance with the

new steel as to be able to predict, with absolute certainty, how a given plate or bar would behave under every varying condition of stress and strain. As a consequence, no engineer or inspector would now permit the drastic treatment meted out to steel in its early years. No engineer would allow steel to be punched and sheared without subsequent reamering, planing, and annealing; or allow any work to be done upon it at a blue heat. No engineer would accept a high carbon or hard steel, with high tensile strength and low tenacity, for structural purposes. Cast-iron has never been systematically treated with the same precautions as mild steel, or even wrought iron. Inspection usually begins where it ought to end—at the test-bar. If my articles illustrate anything, they demonstrate the fact that the test-bar taken alone is a delusive test. To be of value it must be taken in conjunction with many other conditions. These conditions would be chiefly of a practical nature, relating to the work of the foundry itself. It is easy to select metal that will give a test-bar of given strength and deflection;

but it is not so easy to insure good design, nor care in the details of work in the foundry, and it is in the foundry, therefore, that inspection ought to be chiefly done, and done by practical men. Test-bars may be cast, and bent, and broken, and the results recorded in decimals of an inch. But test-bars, as I have already remarked, do not tell the designer all which he ought to know. They only go a little way in that direction. They tell nothing about any of the evils which result from bad designing, or bad moulding and casting. They do not serve to indicate the weaknesses due to unequal shrinkage stresses, or to inaccurate setting and imperfect securing of cores, insufficient venting, the pouring of cold metal—in short, all the evils which follow from neglect of, or indifference to, the most elementary principles of the founder's craft.

But inspection of this character is, as a rule, that which is not done. Few inspectors watch the work of the foundry through. They either come in just at the time of casting to see the test-



bars run, or they take the test-bars offered them as indicative of the quality of the metal in the casting. Building operations are not done in this slipshod, easy fashion. If an important structure is being erected, a clerk of works lives among the work, and looks to every minute point of detail, whether relating to material or to workmanship. But castings are largely taken on trust, and if they fail, the material is blamed, and not the neglect of the exercise of technical skill and judgment in selection of material, and good workmanship. To insure the best foundry work it is necessary that supervision should be exercised. An inspector should live in a foundry in which any important works are being executed. The disaster of the Tay Bridge would never have occurred if adequate supervision had been exercised in the foundry. By adequate supervision I mean that of practical men, not of office men. A man must have an extensive knowledge of moulders' work to be qualified as a judge of the character of that work; just as a man must have an extensive knowledge of steel and wrought-iron work before being intrusted with the testing of, and passing judgment on, the same.

There is no mystery about cast iron as a constructive material. If a casting fails, there is a reason for it. If there are hidden cavities in cast iron, so are there in steel. If there are lines of imperfect union in castings, so are there in steel and wrought iron. If cast iron has its weaker characteristics, so have wrought iron and mild steel theirs. If bad workmanship is done in one, so is it in the other. But much is quite preventable, and that which is not always preventable, or which has not been prevented, can be detected by qualified supervision if exercised from the commencement, and not at the termination of the work.

Manufacturing engineers use cast iron very extensively, and trust it. The reason is that the whole of the work is moulded and cast under the personal supervision of practical men, the foremen and managers, who are expected to be able to give a good explanation of everything that occurs. There is little or nothing mysterious by way of explanation urged or accepted when anything goes wrong. Such excuses are simply of the nature of "blinds," which do not deceive a shrewd employer. If a piece of cast work is bad in any respect, there is a reason for it, and there's an end of the matter.

These are the reasons, I think, why cast iron has, in the opinion of many, fallen into much disrepute as a material adapted for structural work. It is not surprising that such an opinion should have gained currency, since any other material which should have been treated in the careless way in which this has been treated would have fallen into equal disrepute.

Cast iron has, moreover, fallen on evil times. Wood and stone have been used for millenniums past, cast iron has not been in use for more than about three centuries, and for structural purposes on a considerable scale not more than a century. It has also been chiefly employed during the period in which the craze for cheapness for the lowest tender has been most rife. It has likewise been most extensively employed since the hot blast substituted a cheap, inferior metal for the splendid iron of the cold-blast furnaces. It has been most extensively used also contemporaneously with the rapid development of malleable iron and mild steel, and it has been used with less judgment than these. Had a fraction of the care and judgment which has been devoted to structures built up in stone, in wrought iron, and in steel been devoted to those made of cast iron, its reputation would not have suffered so seriously. Unfortunately, engineers and architects have not begun aright. None but practical founders understand how cast iron should be dealt with.

It is from the standpoint of the foundry, therefore, that design should be evolved, and not from that of the office. At the present time Art and Craft are so far divorced that designs are made by men unacquainted with founding, and the castings are made by men unacquainted with the principles of design. Not until these are rewedded will a higher state of things result. Founders often have to cast articles the design of which would run counter to their own judgment; but then, they simply have to obey orders. Designers would often save themselves much trouble and vexation by asking the opinion of expert founders. In engineers' work it is seldom that any important departure is made in new designs from the ordinary run of practice without asking the opinion of the foreman moulder in reference to

the ease or difficulty of casting. An expert iron-founder is able to tell at a glance, almost as if by unerring instinct, as to the soundness and reliability of a casting made to a given design. If these precautions had always been observed in reference to cast work, very many failures would have been prevented. There has scarcely been a day of my life during the past thirty years, some portion of which has not been occupied in the foundry. I am practically familiar with nearly all kinds of engineers' and builders' castings, and am prepared to assert with confidence that castings in iron can be made perfectly sound and reliable if regard is only had to correctness of design, and care on the part of the founder. If a casting fails, it fails from one of two causes, or from both—improper design, or neglect of the lessons of practical experience. If sifted to the bottom, there is no such thing as good or ill-luck in the foundry. If a bad casting is made, the fault lies either with the moulder or with the designer; there is no reason at all why castings should be honeycombed, or blown, or scabby, or drawn, or fractured, or bad, or weak in any material degree. It is entirely a question of technical knowledge and skill, of common sense, and of price.

There are, as I said in my opening article, many purposes for which cast iron is never likely to be superseded. If there are some disadvantages attendant upon its use, so there are also upon the employment of other materials, and many of the objections urged against it might be urged against

not entirely out-of-doors; the second is used to about an equal extent in and out of doors. This is the classification which I propose to adopt, in the course of the next two or three articles.

## COUNTY LUNATIC ASYLUMS.—XXXVII.

By GEORGE H. BIBBY, F.R.I.B.A.

DISTRICT ASYLUMS AT HOME AND ABROAD.

THE site for the Claybury Asylum is (as its name suggests) upon clay; but it does not appear that this local material was considered very suitable for the manufacture of the bricks used in the erection of the asylum, and I believe the bricks used, of which there are said to have been 27 millions, came from a distance, also that no less than 2,000,000 glazed bricks were used in the building of this asylum. Brickworks are frequently very profitable to the landowners who erect them, and advantageous to the estates on which they are situated; so they might, to a considerable degree, prove remunerative if worked by asylum patients of the able-bodied class; but where this is out of the question (as would frequently be the case) it would appear to be a most desirable economy that, when a new asylum must be erected upon a clay suitable for bricks, that the estate should be purchased long before the period for the erection of the asylum, and that the manufacture of bricks should be commenced at an early period, thus saving the cost of

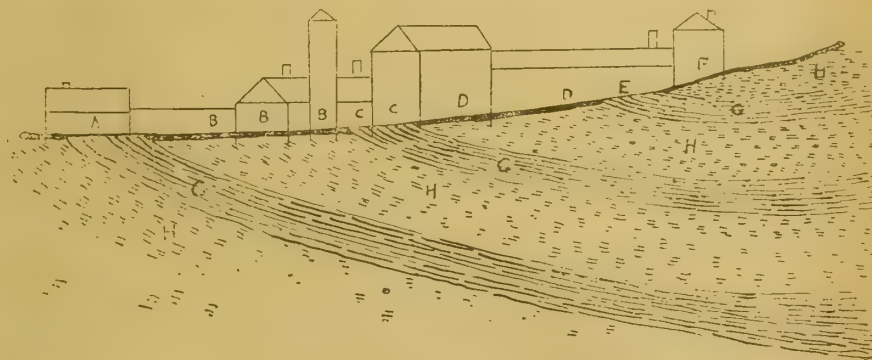


Fig. 58

its rivals. Its chief rivals are timber and stone. Timber is cheaper than iron; but it will not stand such long service in outdoor work. Stone is more durable than iron, but more costly. Stone, moreover, is not so well suited for very light work, everything being considered, as iron. There is a whole catalogue of work which one might name for which iron is far better adapted, cost being included, than either wood or stone. In making comparisons, the question of cost is quite as imperative as that of architectural fitness. The ideals of art and classic taste are worthy of effort; but sentiment must often give place to sordid considerations of cost. In many great public works, and in much domestic architecture, the question of cost puts the rivalry of the imperishable stone on one side, and leaves the readily molten and cheap cast iron as a very good substitute. A gracefully-designed cast-iron bridge is a far more æsthetic structure than one of the ugly braced bridges of lattice-work. It is as tasteful as a severely simple bridge of stone; but the bridge of stone is associated in our minds with the history of many centuries, while the iron bridge is but of yesterday. Hence we regard the first as classical, the second as vulgar, and the same association of ideas occurs also in relation to very much work of other kinds.

From the foregoing considerations it follows that cast iron is a material which, when used under proper conditions, on the lines already laid down, is of the highest value. No other material can adequately take its place. A bare enumeration of the uses for which it is adapted would be very lengthy; but it will be desirable now to attempt some rough classifications of those special uses. The best classification, perhaps, to adopt will be that which corresponds with the two principal directions in which it is employed by builders and contractors—the constructional, and the ornamental. The first includes the heavier, the second the lighter. In the first, strength is the first chief element in consideration; in the second, architectural and pleasing effects. The first is employed largely, though

carriage of many millions of bricks in the case of large asylums.

In reference to the erection of the Claybury Asylum upon a clay site, the medical superintendent, in a recent report, has stated:—"As regards rheumatism, the Milroy lecturer this year at the Royal College of Physicians connected this disease directly with a low level of ground-water, and thus minimised the evil effects of a clay soil, such as that upon which the asylum is situated; but we have had among patients and staff a high average of sickness in the form of rheumatic diseases and feverish colds. Perhaps it is that we stand upon a plateau 240ft. above the sea level, and exposed to varying winds, and that we are not far from the shores of a great river—conditions that are certainly favourable to rheumatism. On the other hand, to those not predisposed to this disease, the site is bracing and invigorating, and it affords a vast panorama of the surrounding country."

In certain tenacious clays soil-drains will frequently draw only to a few feet on either side, while in the freer soils they will draw to a great distance. That a multiplication of soil-drains gives a greatly increased dryness to land has long been known; but it is only within a comparatively recent period that the practice has been pursued upon scientific principles, and conducted in a uniform manner. By opening up numerous underground channels, so that the whole space is acted upon, the greatest degree of dryness which the case admits of or requires is obtained. Not only is the ground rendered more constantly dry by the opening up of many channels of this kind, but it is more quickly freed of the water conveyed to it by falls of rain, and this is felt to be peculiarly beneficial in the case of the stiffer clays, which retain the water absorbed by them for a much longer time than the freer soils.

It was in Essex, in which county the Claybury Asylum is situated, that the method of draining by opening numerous outlets regularly disposed, is said to have been first practised. The old system was to run a shallow drain in each water furrow,



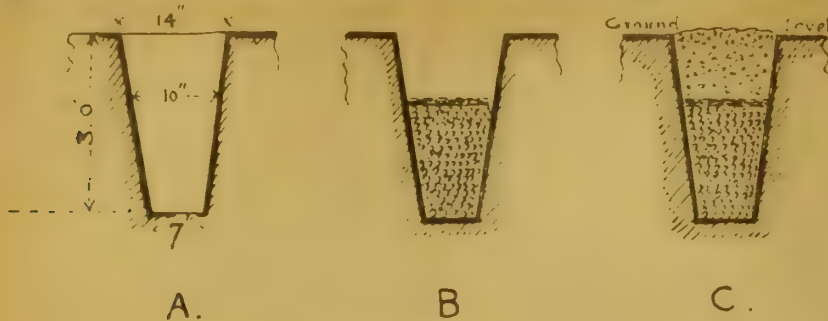


Fig. 60.

filling it with brushwood, twisted straw ropes, or similar material. In course of time bricks or tiles moulded to a suitable form were employed, and the practice became very generally known as the "Essex" system of draining. It gradually extended to other clay-land districts of England, but in later years it has been widely pursued in districts having soils of a very different nature to the clay lands of Essex, in which the system originated.

The trenches in this kind of draining may either be formed along the line of descent, or in some direction oblique to it. Thus in the diagram shown in Fig. 59, which represents the

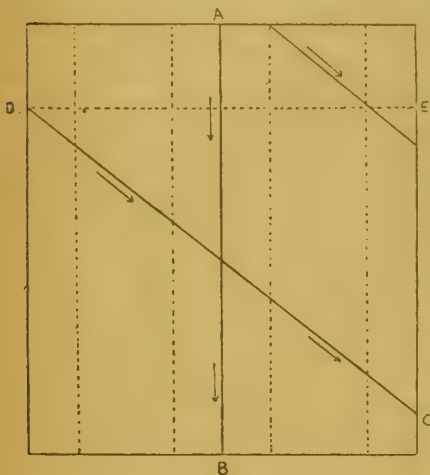


Fig. 59.

area of a plot of land inclining in the direction A B, the lines of trenches may either run from the lower to the higher ground in the direction of B A, or in some direction oblique to it, as C D, the true direction with relation to the intercepting of water (either upon the surface or underneath, and proceeding from the higher to the lower ground) would be in the direction D E at right angles to the line of descent; but in this case the water would have no fall in the trench, and therefore it is necessary to incline the trench at such an angle as shall give the requisite fall.

The obliquity would be least where the inclination of the surface is greatest, and gradually, as the surface approaches the horizontal, the line of the drain should approach to the line A B until both coincide; that a trench in some direction oblique to the descent will intercept a greater quantity of water percolating under ground from a higher to a lower point, than a trench run in the line of descent is shown in Fig. 59; but other considerations render it in many cases better to run the trenches in the line of descent rather than oblique to it.

In Fig. 60 is shown a method of forming the lesser parallel drains, and the receiving drains may be formed in a similar manner, with a conduit at the bottom having an aperture of about 7 in. in width; but where the number of drains conducted to them is large, it will be necessary to form culverts. These should be placed somewhat deeper than the smaller drains.

When, as is frequently the case, the asylum buildings occupy many acres of hitherto unopened land, the excavation of the foundations of the various erections (being widely apart) may have the effect of tapping the water-bearing strata on the site, as indicated on Fig. 58, where the water bearing strata is marked G, and the dry strata H.

The effect of these excavations would be that unless ample means of drawing away the water from the foundations were provided, that the buildings at A C E would be subject to damp, while those at B D F would have dry foundations, unless subject to overflows from the two upper water-bearing strata, over the clay or other resisting substances at H.

These are difficulties more likely to be met with in the case of very large asylums than with any other class of residential buildings, for no others occupy so great an area of land.

Upon many asylum estates, and more especially in the case of those occupied by male patients from the agricultural districts, such works as drainage, &c., may frequently (as I have stated in a former paper) afford a useful means of occupation. The workmen, or, rather, the group of workmen (for it is better that three patients be employed together), commence at the lower part of the ground, working up to the higher. The breadth of the trench at top should be marked on the ground by the line and notched by the spade. The turf, if there be any on the surface, should be pared off and laid aside, and next the loose earth is taken out by the spade or shovel and laid by the side of the trench. The harder subsoil is then removed. The trench is first dug to the depth of the soil; it is then excavated to the depth allowed by a wide spade (the lower depth being made by a narrow spade), and the sections obtained shown on Fig. 60. Each trench should be completed before the filling-in of the stones is commenced—bricks or tiles, &c., and the work of filling should proceed from the higher to the lower ground (and never in the reverse direction). The work is thus done with less risk of interruption from mud and water, and the means are afforded, before laying the materials, of ascertaining that the trench is properly made, and especially that the bottom is so equalised as to allow the free descent of water.

The materials, whether brick, stone, or tiles, &c., should be of small size, or, if large, broken to the size of road-stones, so that they shall pass through an opening of not more than 3 in. at the most. They should occupy about one-half of the depth of the trench, and care must be observed that no large stones lie at the bottom. They should be thrown into the trench by a broad shovel, and must be left level at the top. Care must also be observed that the loose earth does not fall in among the interstices. This is prevented by placing the sod, if any has been preserved, above the stones, or smithy ashes, tanner's bark, ferns, or other substances suitable for the purpose. But even these precautions may be rendered unnecessary by placing a layer of the smallest stones, separated from the others by screens, at the top, and beating them down, so as to pack closely. In Fig. 60, A shows the empty trench, B the trench with the stones filled in, and C the completed surface-drain.

(To be continued.)

The "Leeds Cupboard Fastener," patented by J. Sykes, of 11, Buckton-buildings, Cemetery-road, Leeds, is a strong, well-made article, with a novel action. Instead of turning the knob at random, you simply press a button in the knob and draw open the door. The cupboard door fastens by simply closing it, without touching the fastener. Well worth sending for sample of.

A Local Government Board inquiry has been held at Bishop's Stortford into an application by the urban district council for permission to borrow sums of £829, to cover the costs incurred in relaying the water-mains burst during the late frost, and of £300, for additional water-meters. There was no opposition.

## OBITUARY.

WE regret to announce the death of Mr. JOHN THOMAS NEWMAN, F.R.I.B.A., of 2, Fen-court, Fenchurch-street, E.C., and Kelvedon Hotel, Brentwood, the head of the firm of Messrs. Newman and Jacques, which occurred on Sunday last at the Cottage, Gunnersbury Park. Mr. Newman, who was in his 66th year, joined the Institute of Architects as a Fellow in 1886.

The death is also announced of Mr. JOSEPH SHIELDS, architect, Sunderland, who died on the 22nd of December, at Edentown, Carlisle. Mr. Shields was a well-known Primitive Methodist, and had erected a large number of churches and schools for that body in the North of England. He was recently appointed architect for the Sunderland Union Infirmary, which he won in competition. Mr. Shields was a member of the Northern Architectural Association.

## CHIPS.

On Saturday, the Bishop of Wakefield, Dr. Walsham How, dedicated a new infants' school which has been erected in connection with Christ Church, South Ossett. The building is erected of stone, in plain Gothic style, and comprises a large schoolroom and two classrooms, with entrance and cloak-room. It has cost about £1,300.

Holy Trinity Church, Ipswich, a building erected about sixty years ago, will be reopened on Sunday next by the Bishop of Norwich, on the completion of rebenching and other internal improvements, and the addition of a new chancel.

Several new buildings are being erected by Messrs. W. H. and F. Winterton on their land, in close proximity to the enlarged Midland Railway Station, Leicester. A block of four shops, with offices and auction-room, coach-building works and showroom, also furniture repository and stables. The plans have been prepared by Mr. C. Kempson, C.E., A.R.I.B.A.

Messrs. Fambirini and Daniels, architectural concrete works, Lincoln, are now supplying a series of modelled tympana for schools at Hanley. These are to special designs. Messrs. Scrivener and Sons are the architects, and Messrs. Tompkinson and Bettelley are the contractors. This firm have also secured the second contract for Middle Class Board Schools, Boston, in addition to which they are now supplying for the Staniland Board Schools under the same architect, Mr. James Rowell, Boston; Mr. H. W. Parker, contractor, of the same town.

The panels of the reredos in St. Mary-le-Tower Church, Ipswich, have been filled in with carving as a memorial to the late vicar, Canon Turnock. The central panel is a representation of the Crucifixion, with St. Mary and St. John; the side panels contain 28 angels, representative of the symbols of the passion. Above the panels are the words, "We praise Thee, we bless Thee, we worship Thee," in gilt. The architect is Mr. Smers Clarke, F.S.A., of Westminster; and the artist, Mr. Hamilton Jackson. The work has cost £350.

Commencement has been made at Hexham with a new branch bank for Messrs. Lambton and Co., of Newcastle-on-Tyne, one of the oldest bankers in the North. It comprises bank, manager's room, residence for manager, a suite of offices, shop, and ample cellarage. The ground-floor story of the front will be faced with Aberdeen granite, above faced with T.L.B. bricks and dressings of Prudham stone. The bank cellars are to be fire-resisting, and the floor over them will be Mark Fawcett and Co.'s system. Messrs. W. and J. Darlington, of Hexham, are the contractors, and Mr. John W. Dyson, of Newcastle-on-Tyne, is the architect.

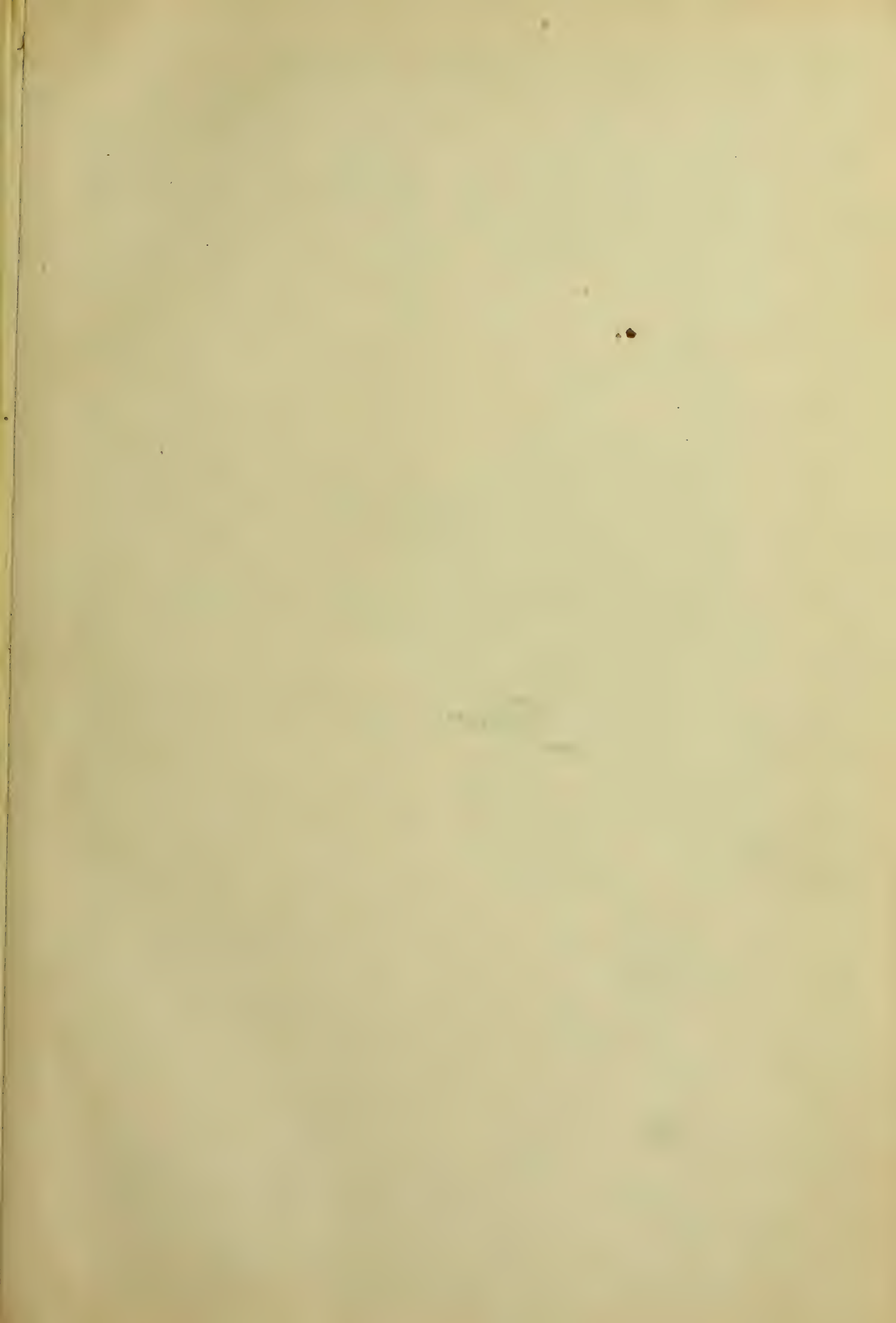
Mr. J. A. Carson, builder, Heathersett, Norfolk, was killed one evening last week, being thrown from his trap while driving home from Norwich.

A memorial to the late Earl and Countess of Selborne has been placed by the inhabitants of Blackmoor, Hants, in the parish church. The memorial, which consists of a tablet of red marble, has been placed on the north pillar of the chancel arch. It bears an inscription, above which is carved the Selborne arms, with the motto "Palma Virtuti."

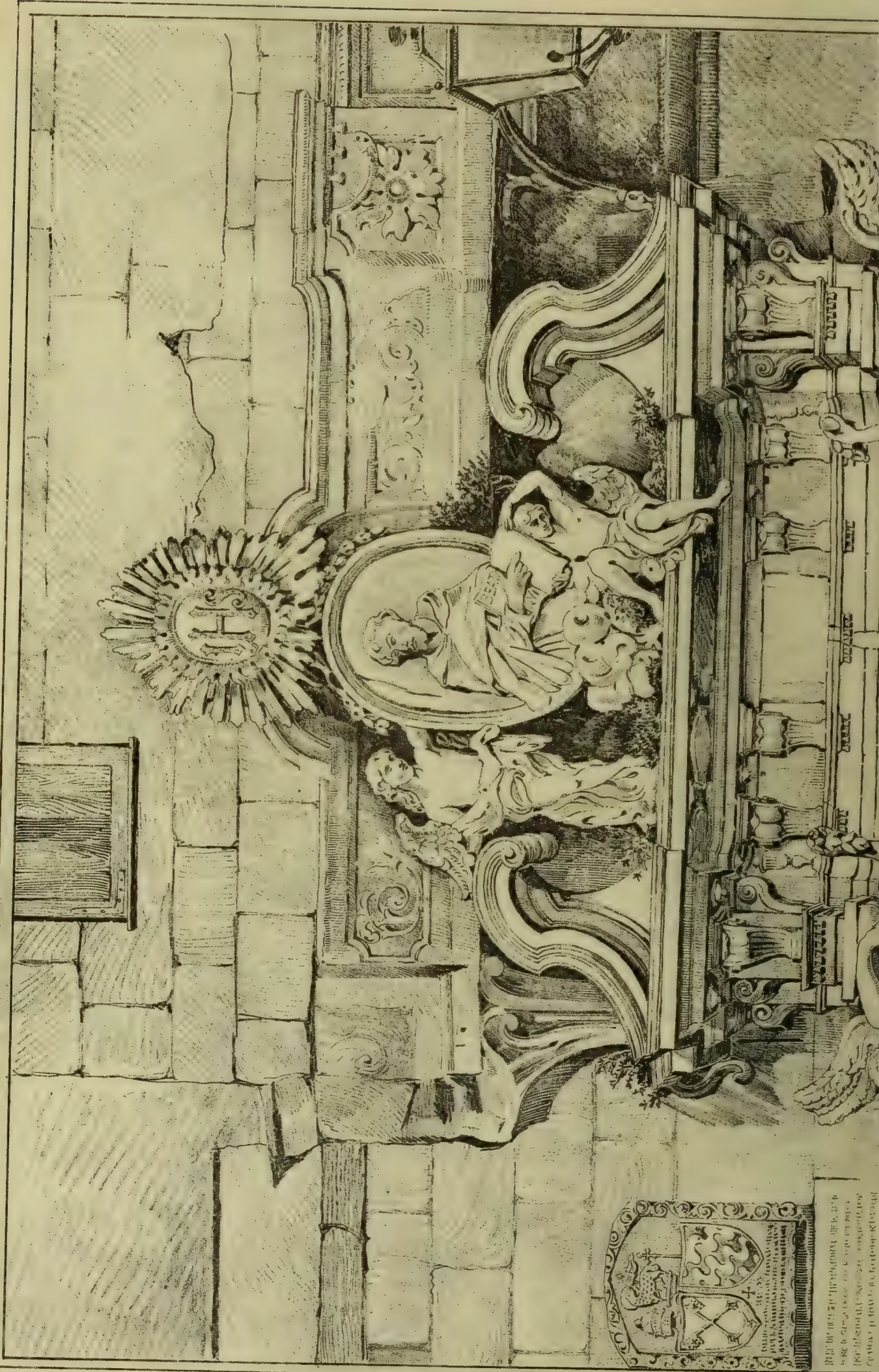
A public hall and technical schools at West Hartlepool have been built, from the designs of Mr. Henry Cheers, of Twickenham. The buildings, which are of red brick, with terracotta dressings, have been erected by Mr. T. Dickinson, as contractor.

On Saturday the Caversham (Reading) justices committed for trial Arthur Haslam, 58, of no fixed abode, who only returned from abroad last week, and who was formerly an architect and surveyor, carrying on business at Market-place, Henley, on a charge of feloniously firing a revolver at his brother-in-law, Thomas Gundry, a brewer's manager, of Goring, on Christmas Day, with intent to injure him.



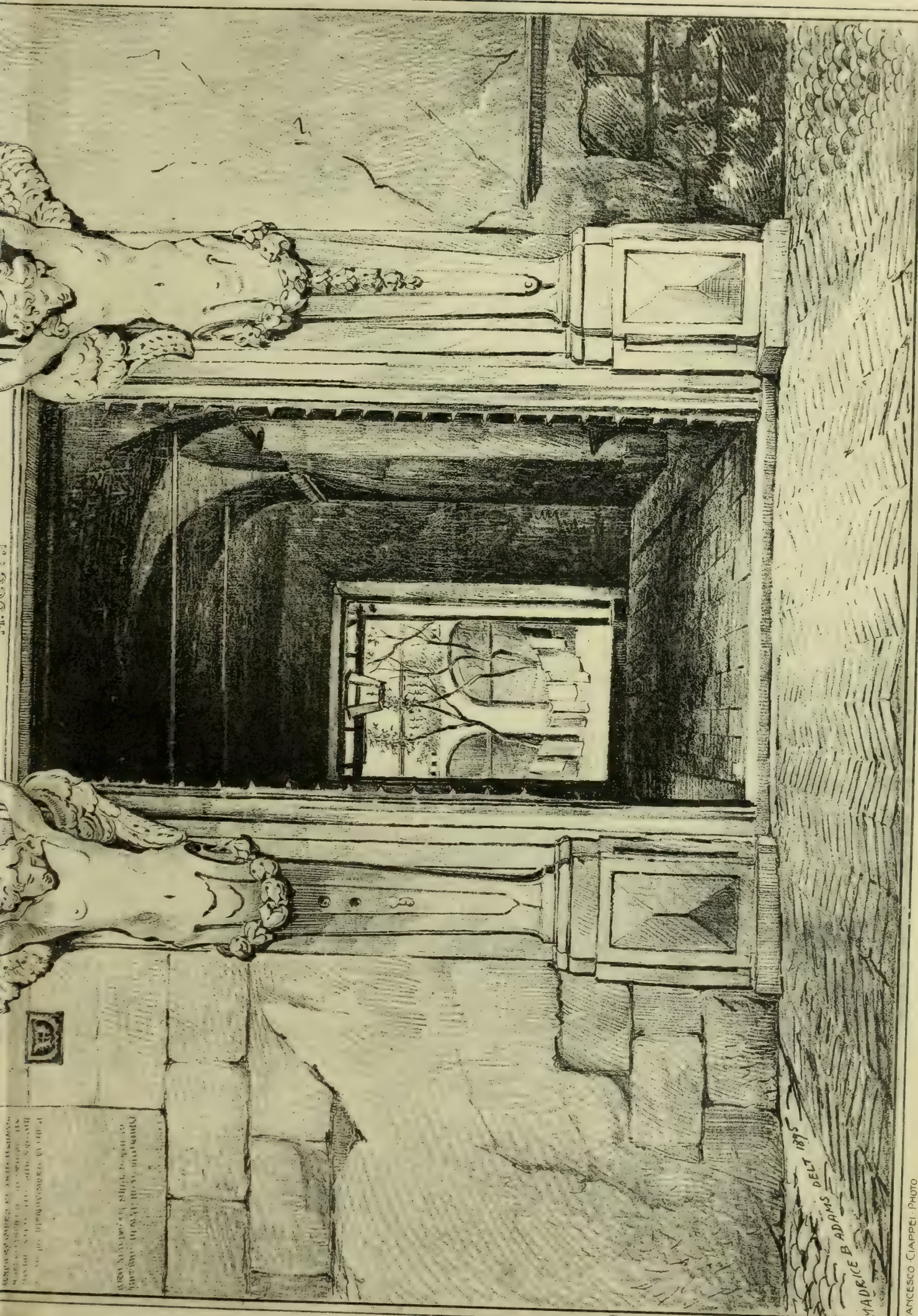






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DOORWAY TO THE CONVENT OF S. SILVESTRO · GENOA ·  
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FRANCESCO CIAPPEI · PHOTO

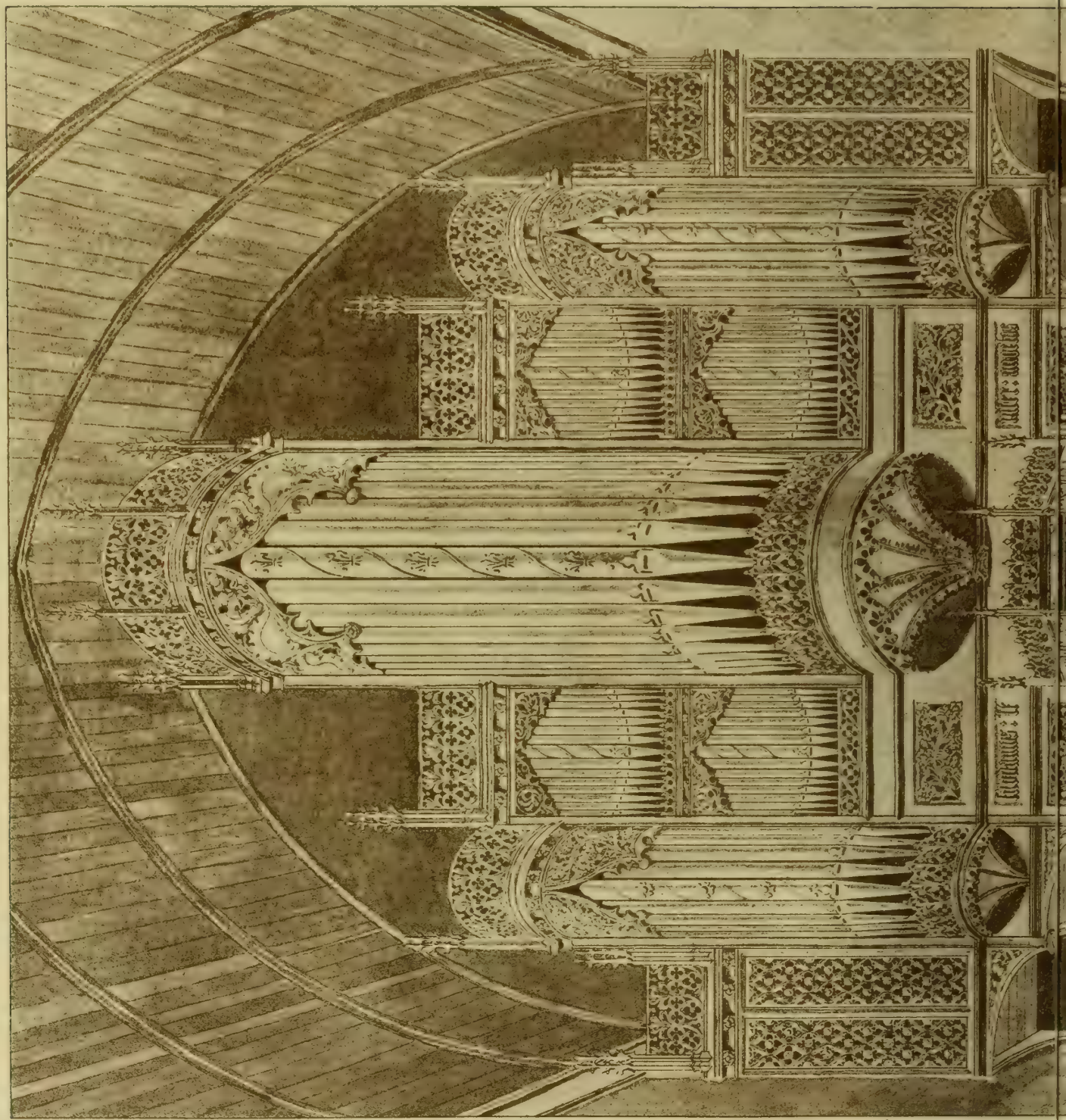




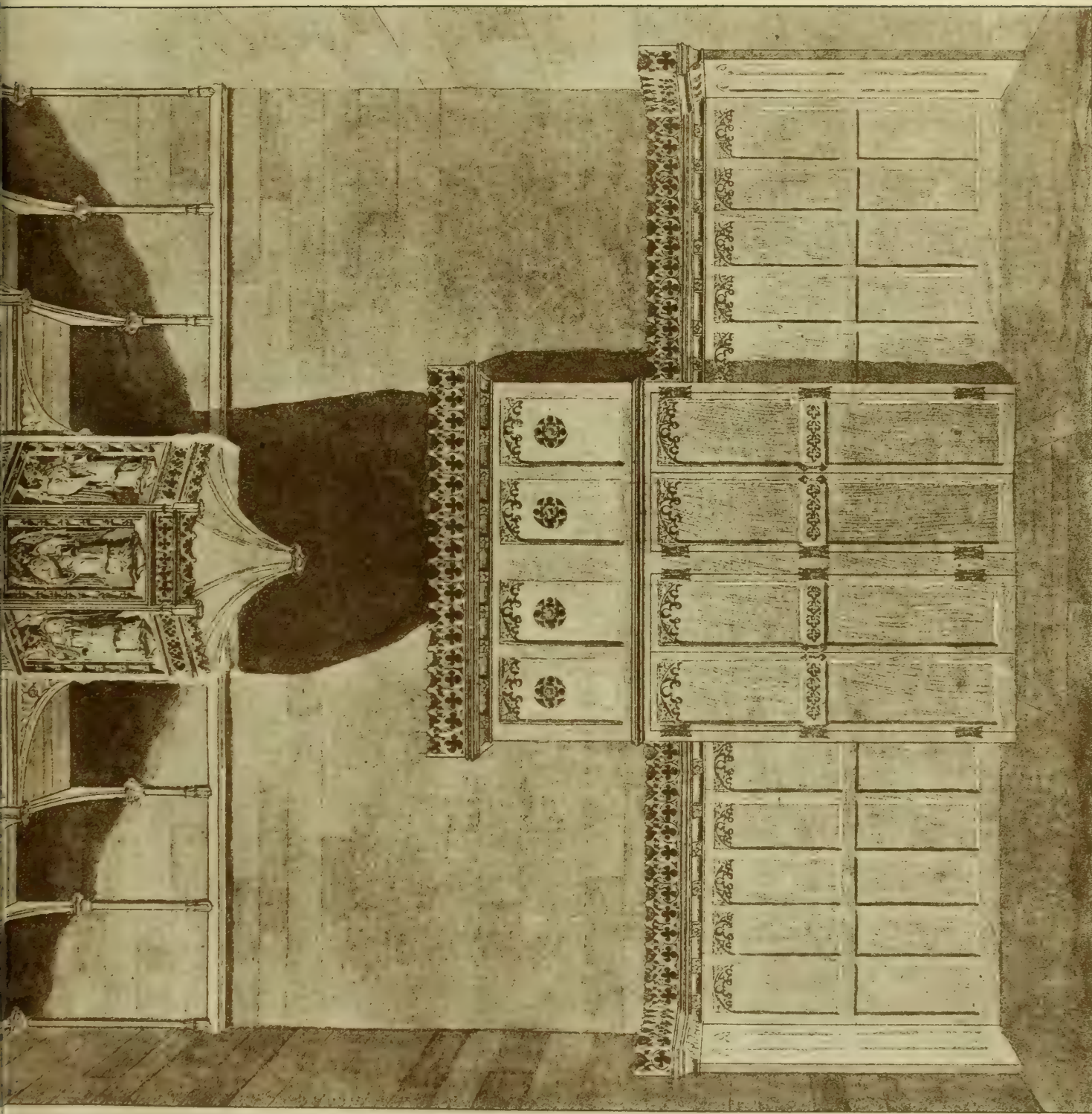












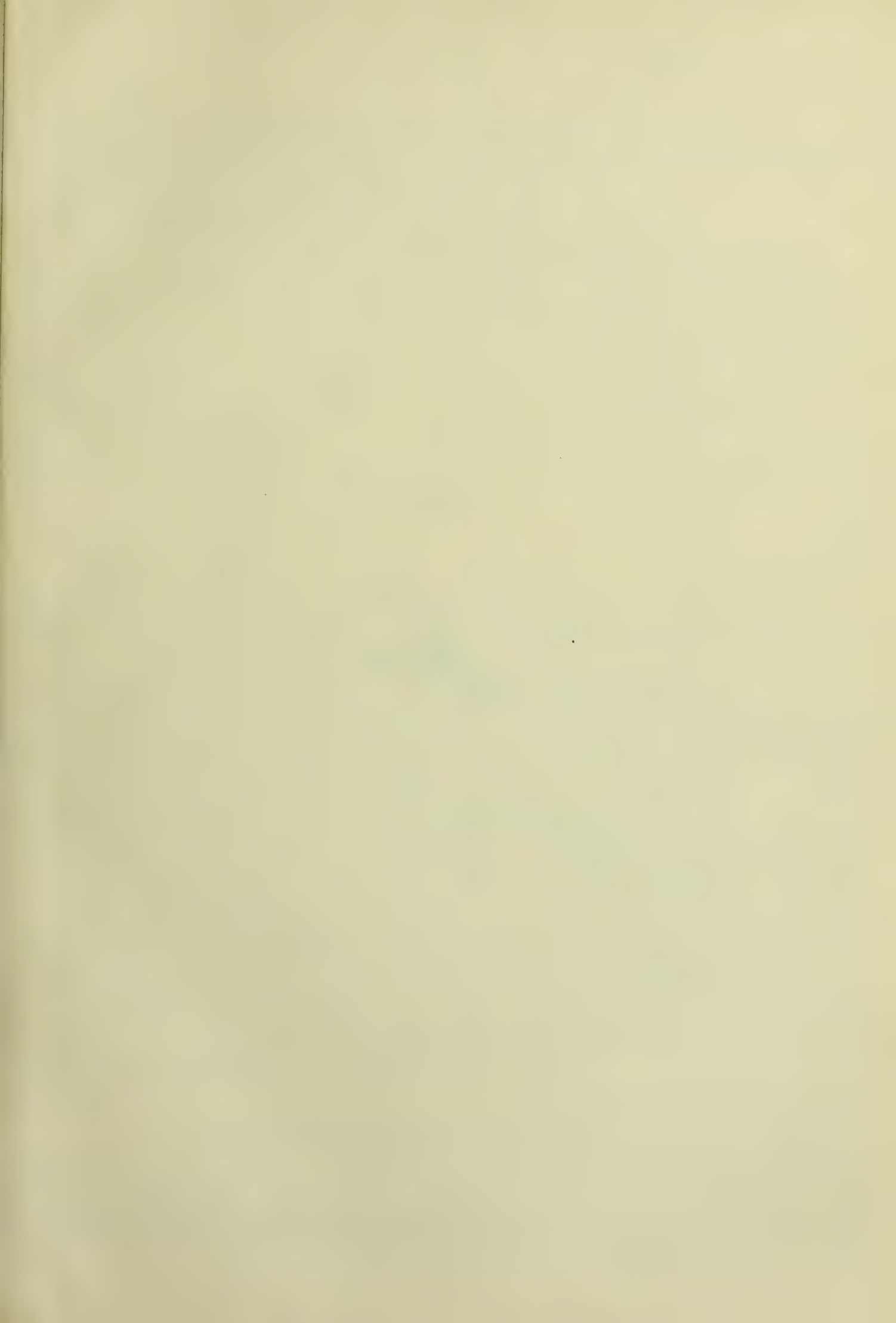
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NEW ORGAN ST. PAUL'S CHURCH · BURTON-ON-TRENT · G. F. BODLEY ARCHT.





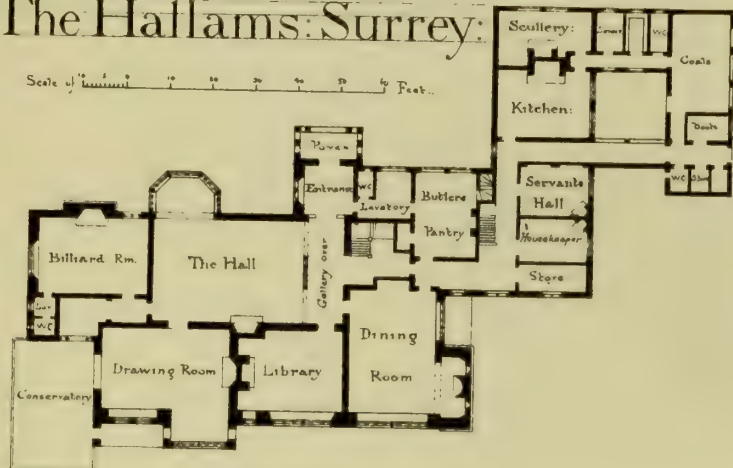






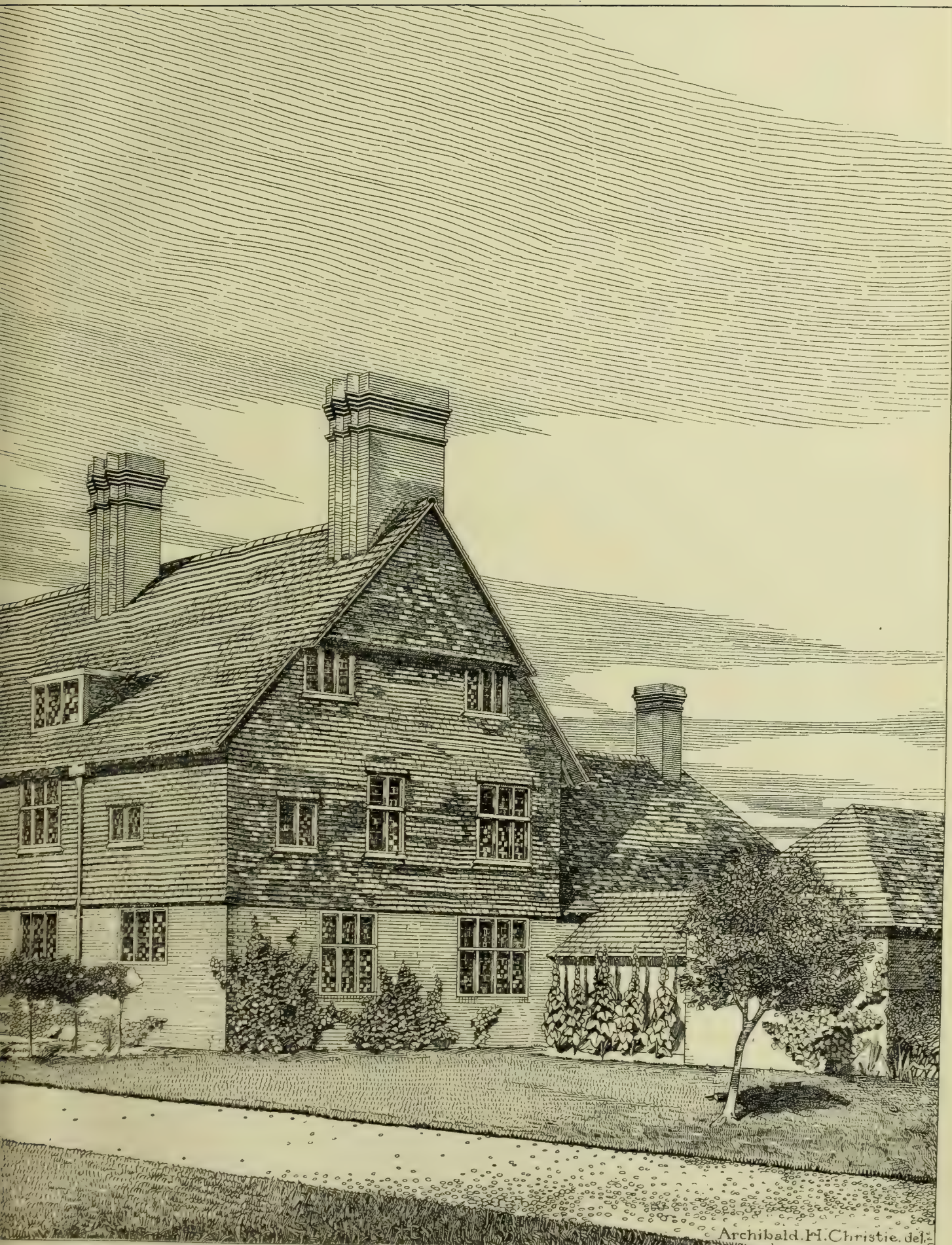
# The Hallams, Surrey.

Scale of Feet.





VS. JAN. 3, 1896.



Archibald F. Christie, del.

Photolithographed & Printed by James Acland, 8 Queen Square, W.

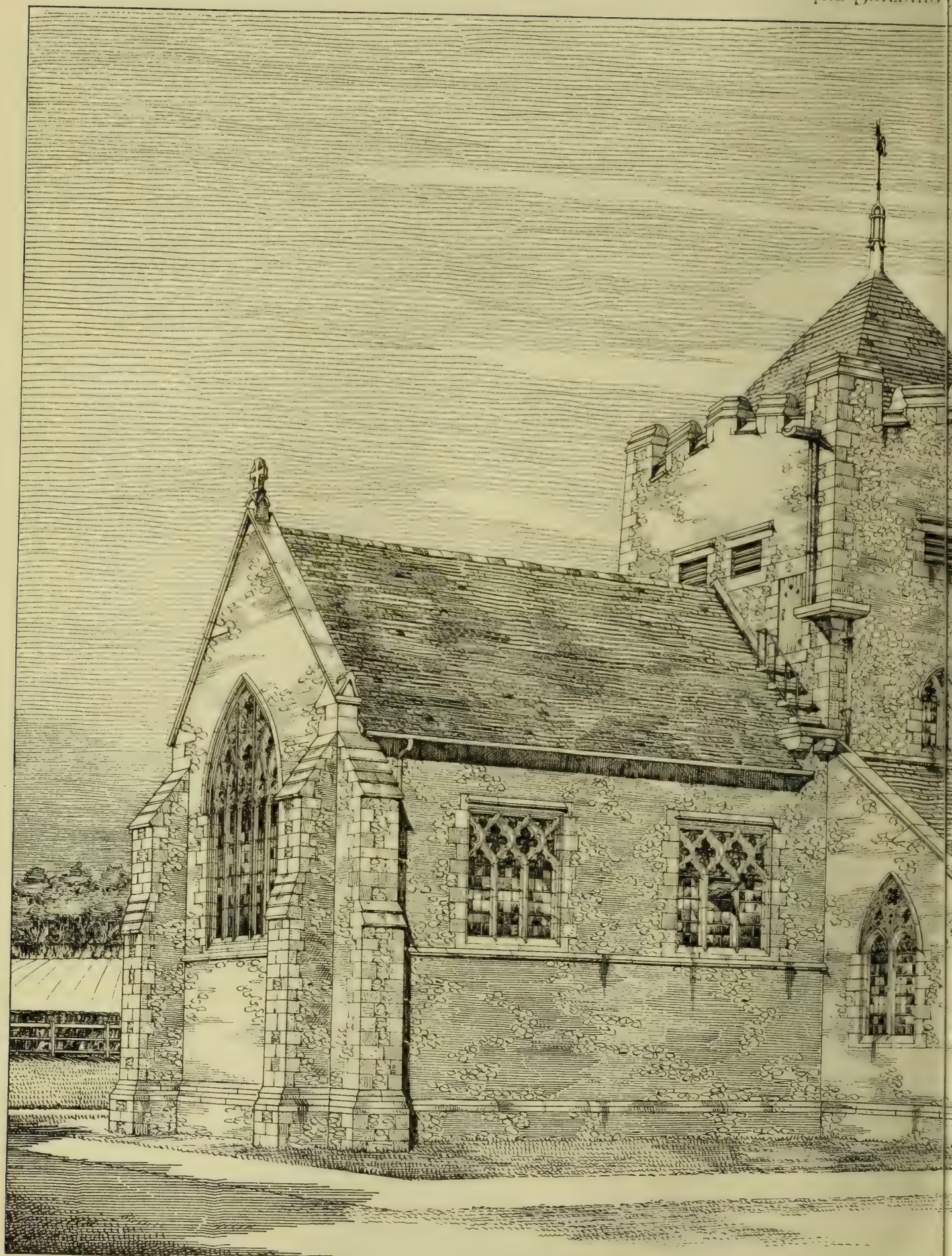






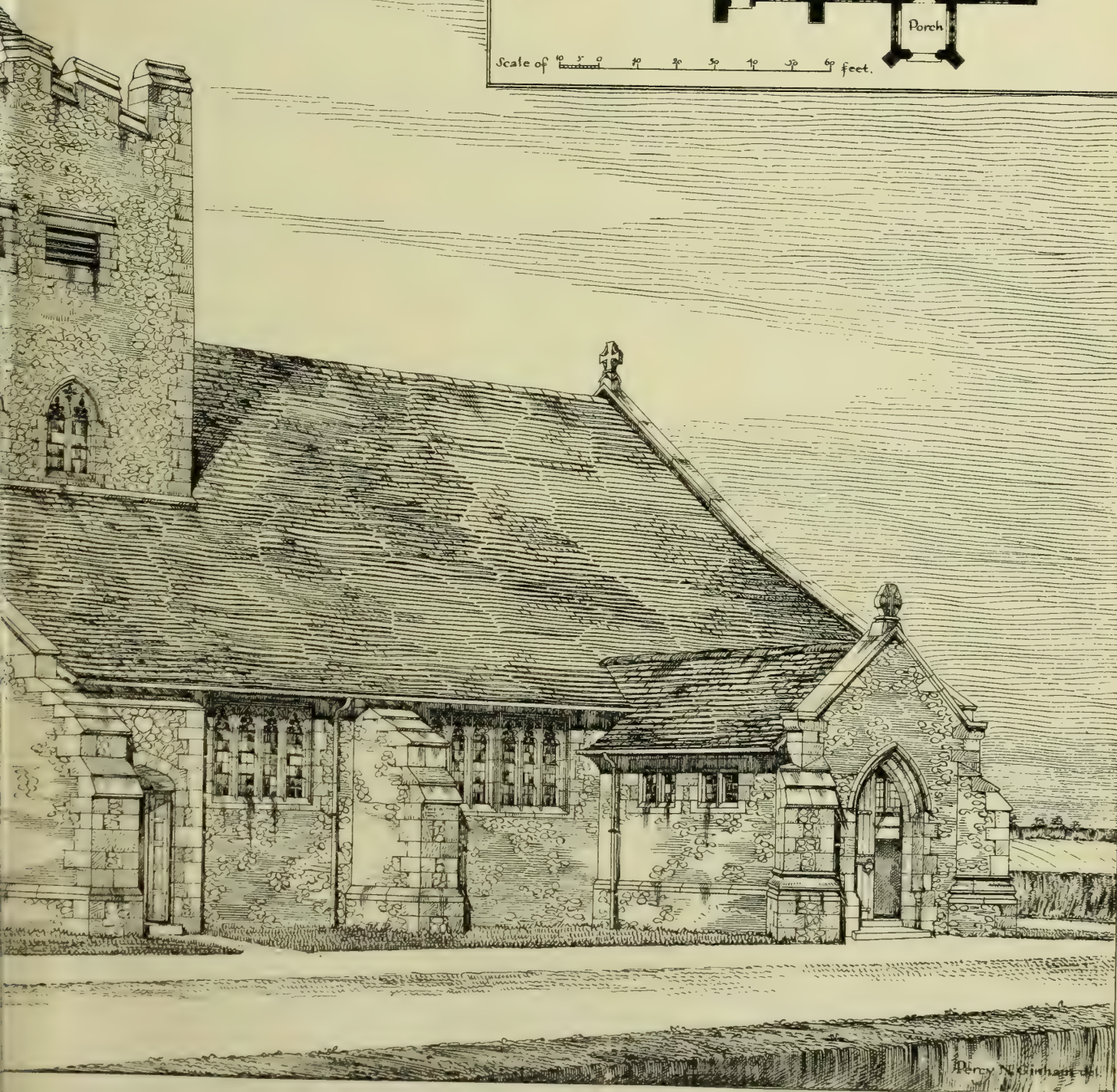
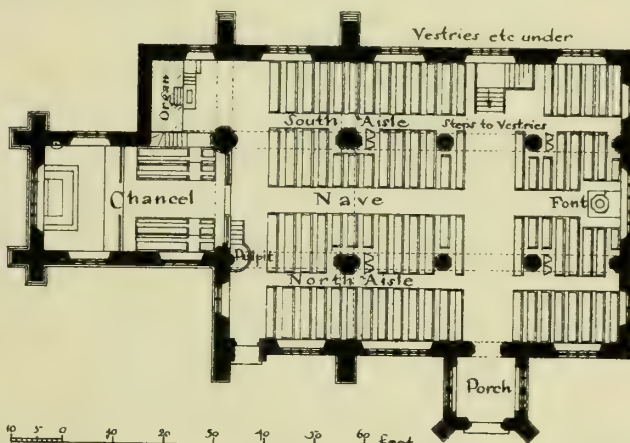








# All Saints Church : Swanscombe : Kent























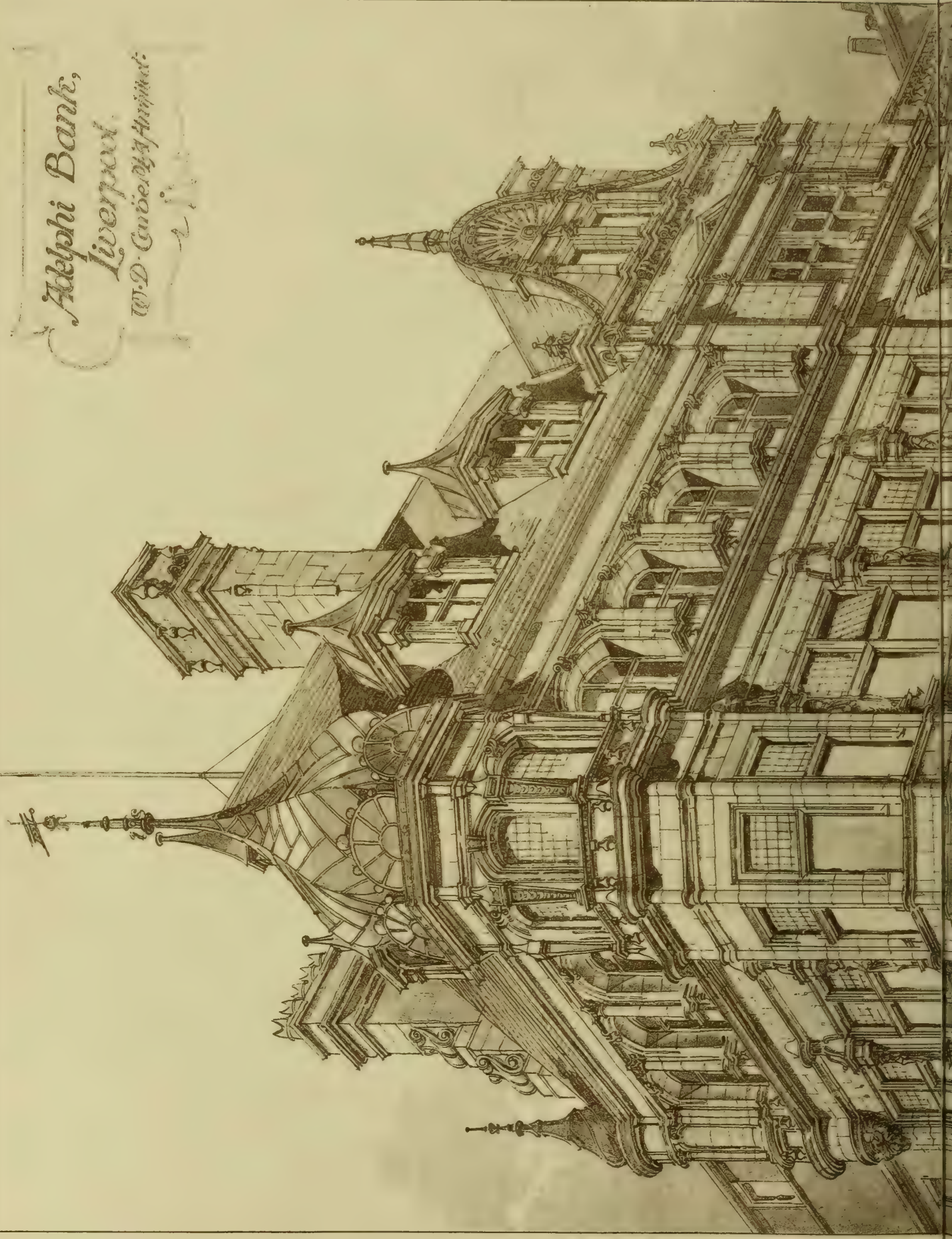






*Adelphi Bank,  
Liverpool.*

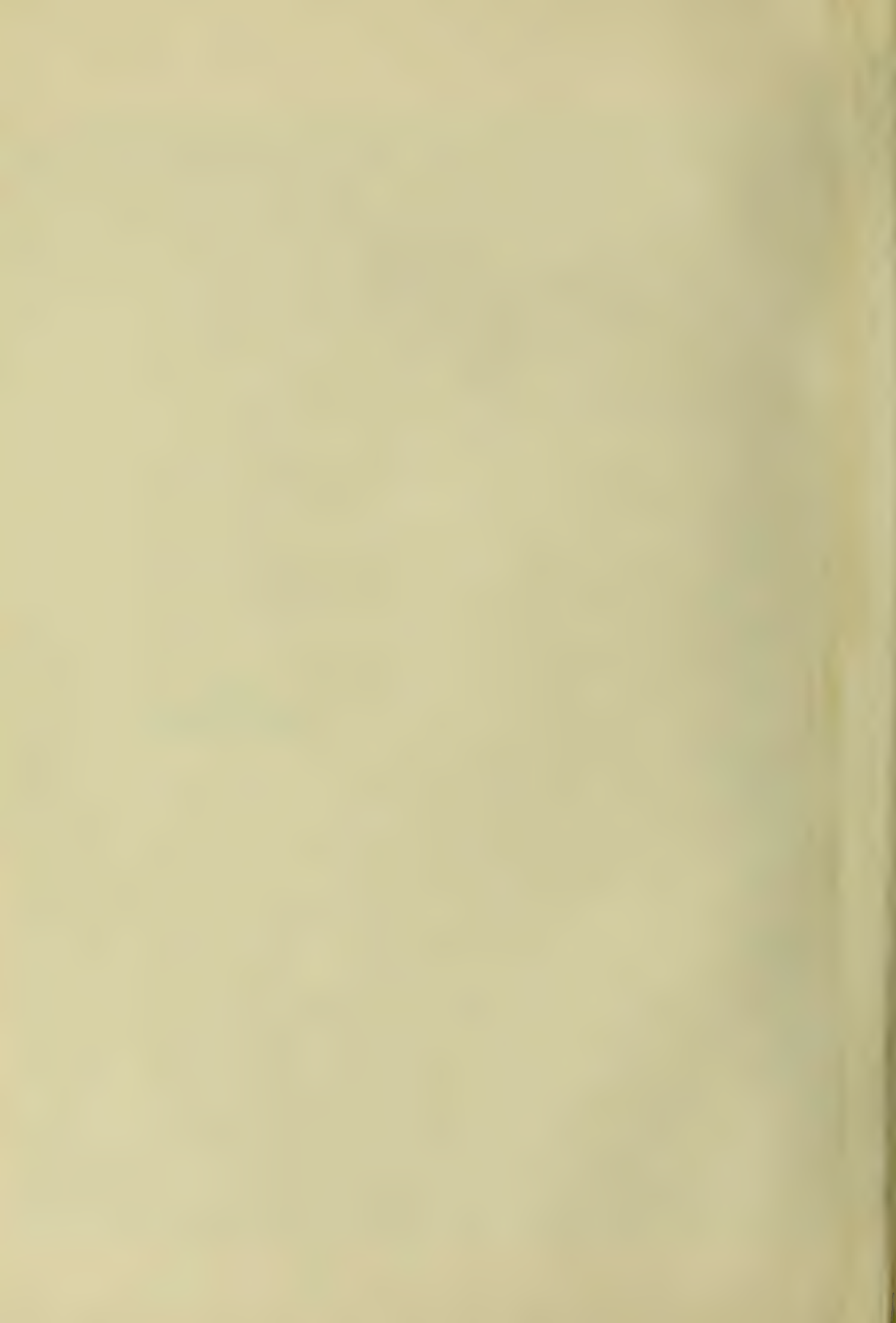
*W.D. Gilbert & Howard.*























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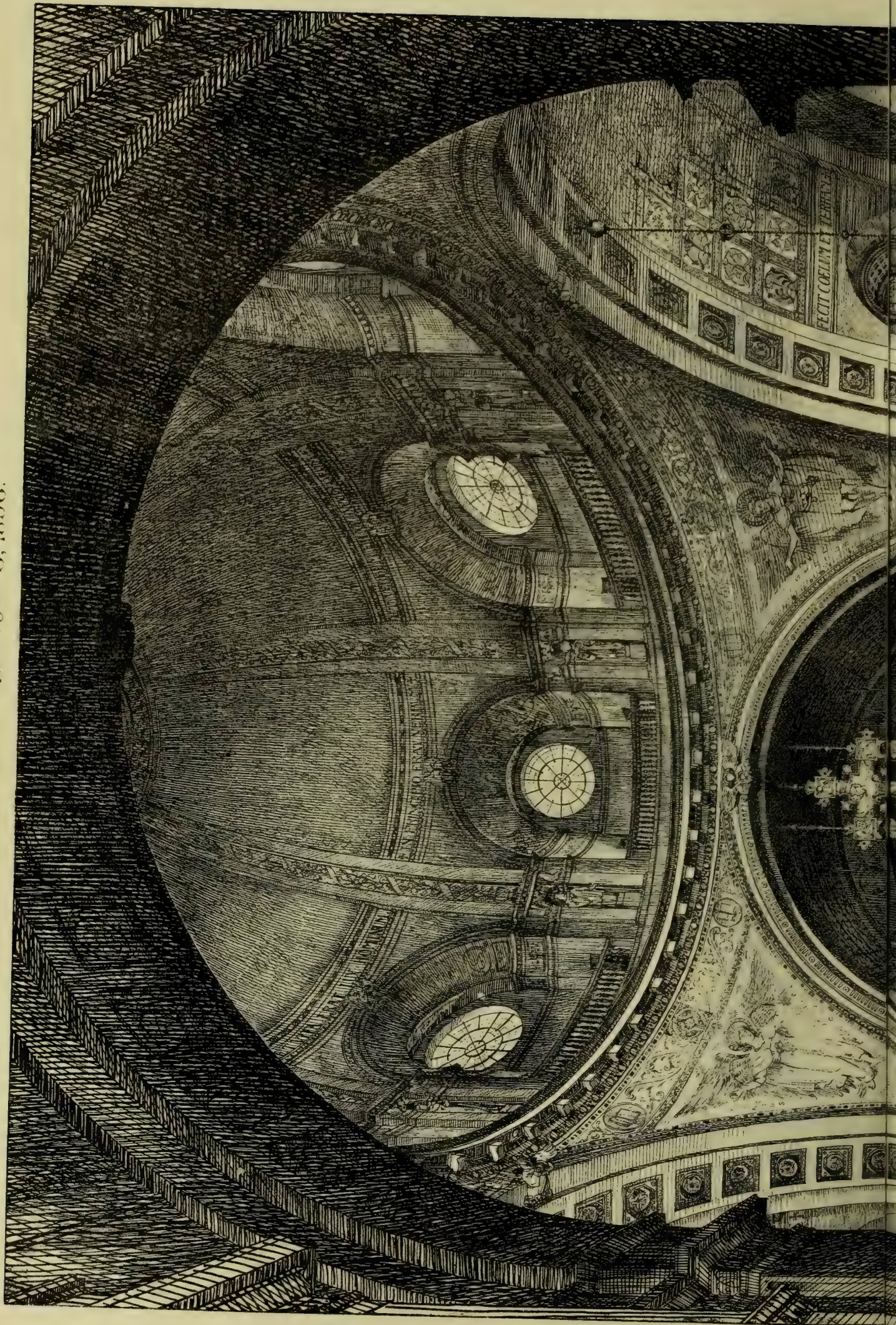




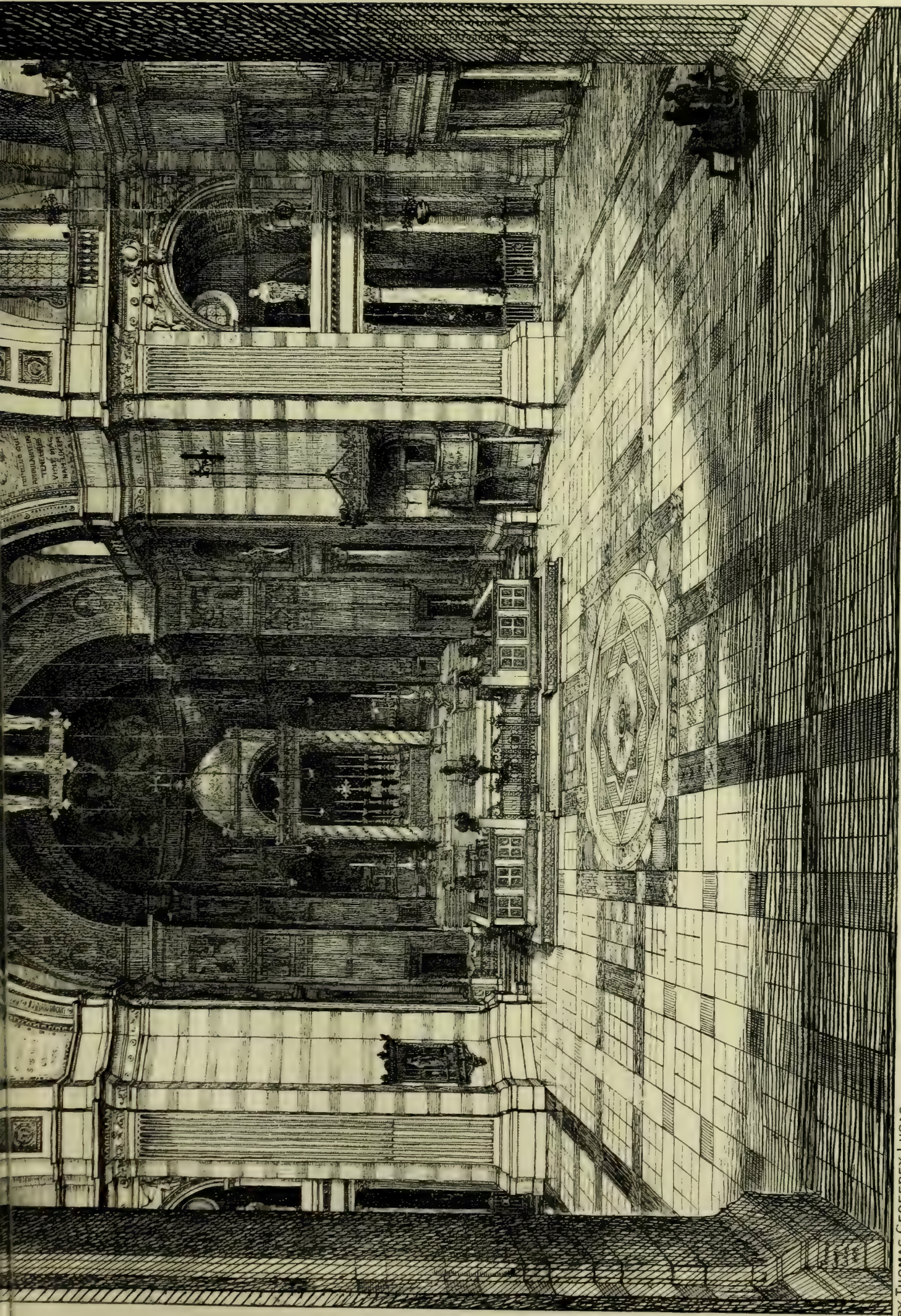




THE BUILDING PEWS, JAN. 3, 1896.





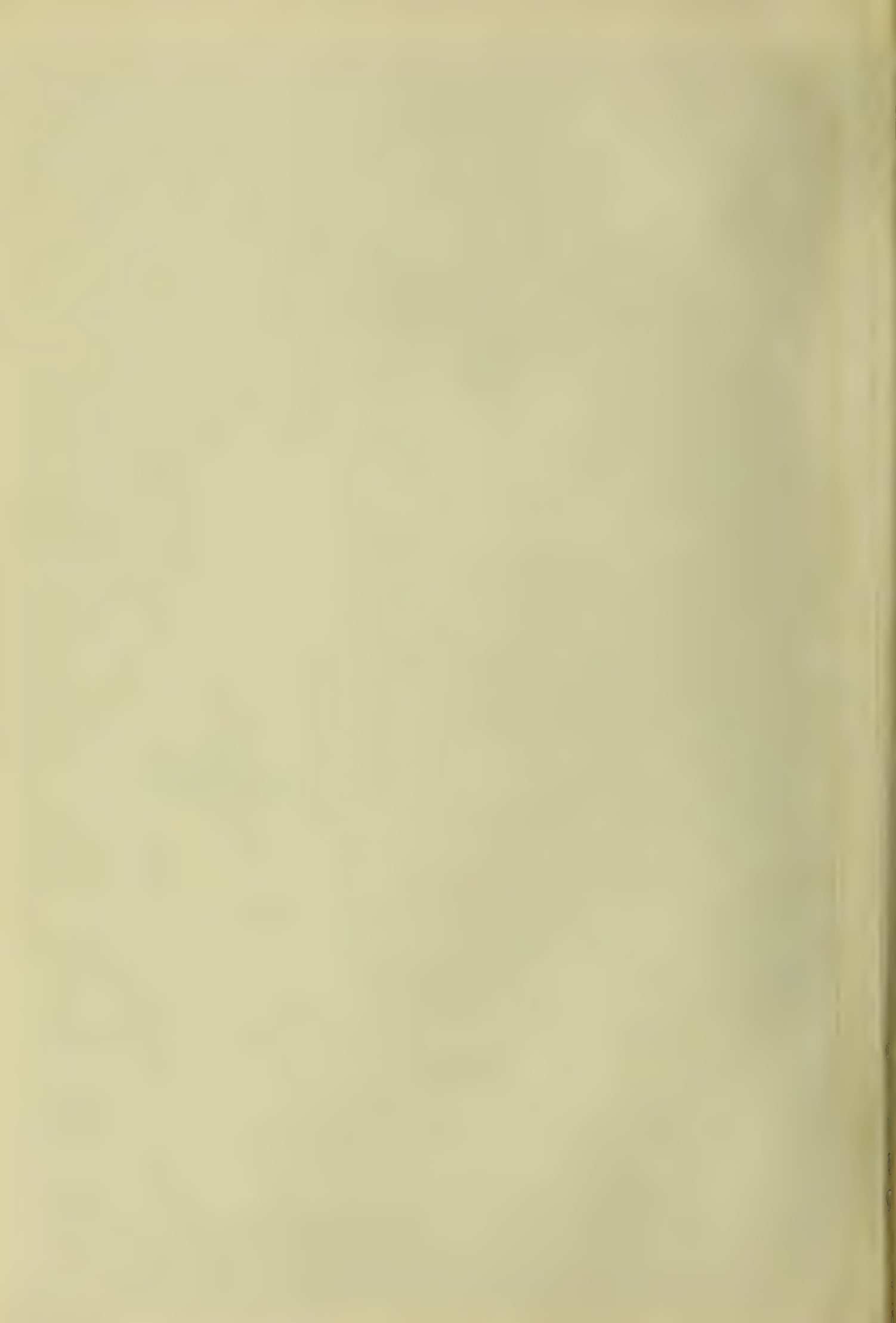


BY THOMAS GEOFFREY LUCAS.

ROYAL ACADEMY GOLD MEDAL COMPETITION.  
DESIGN FOR A LARGE TOWN CHURCH.

Photo Lithograph & Engraved by James Agnew & Sons, Glasgow, A.



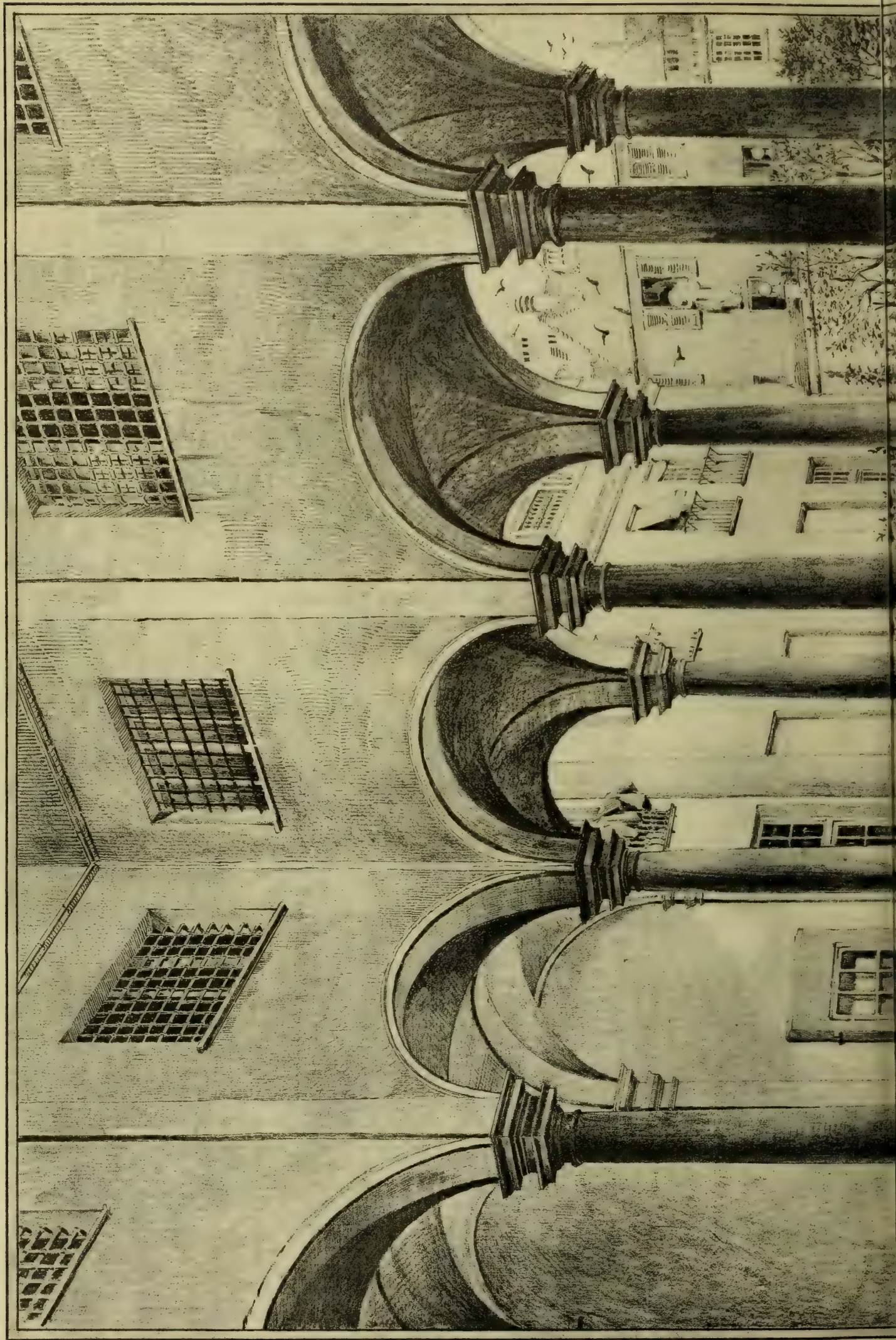




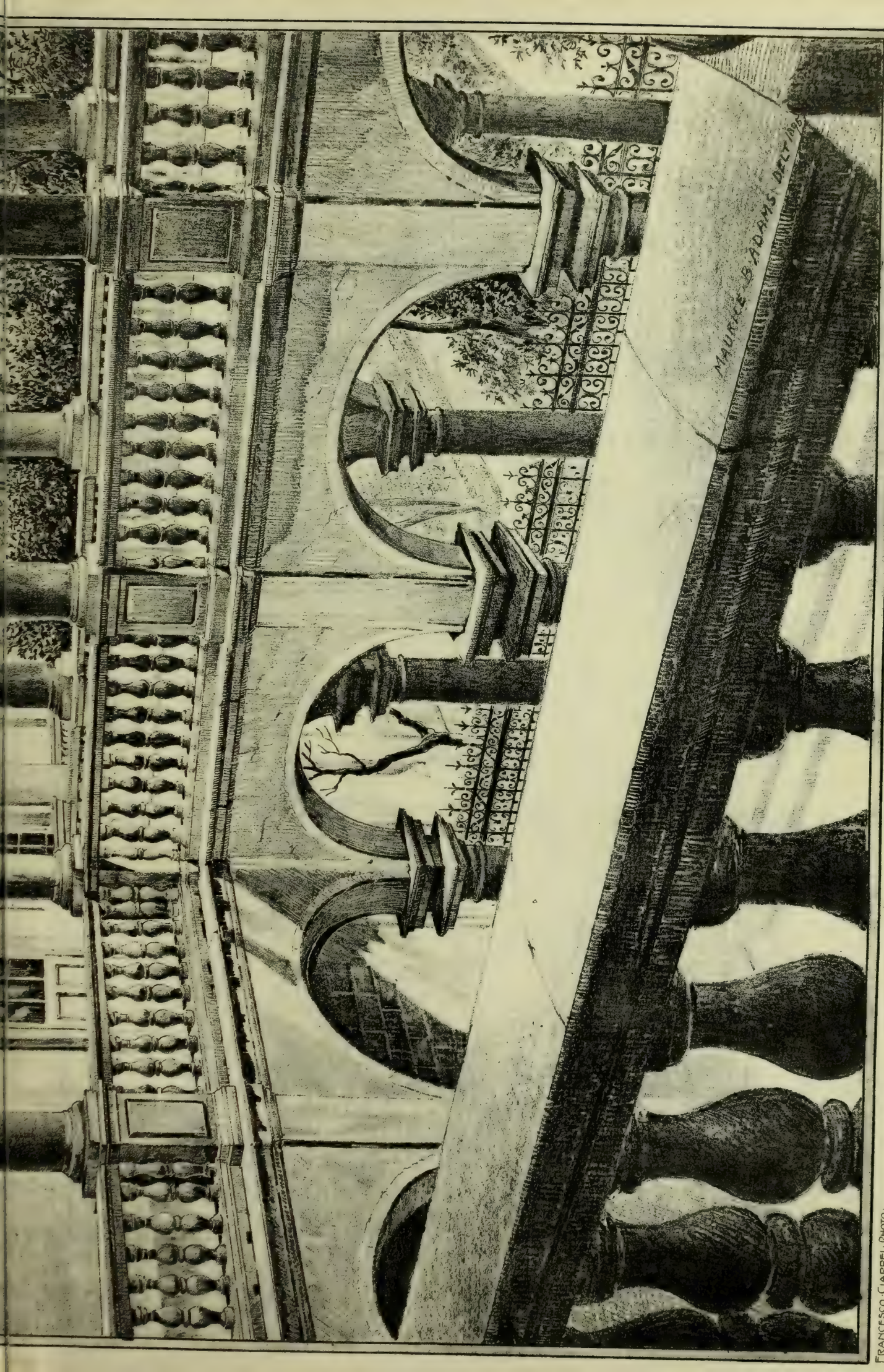




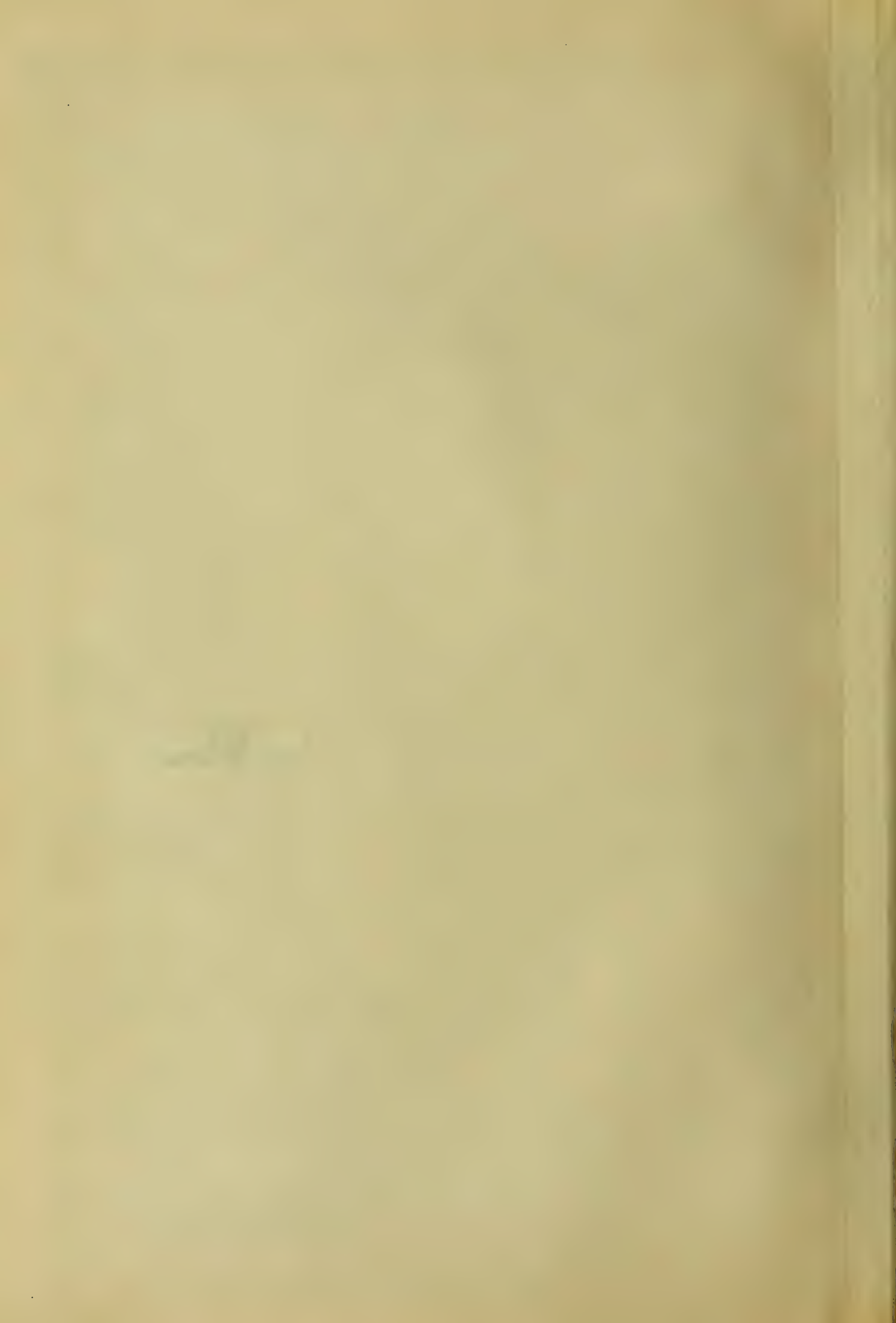
THE BUILDING DEWS, JAN. 3, 1896.





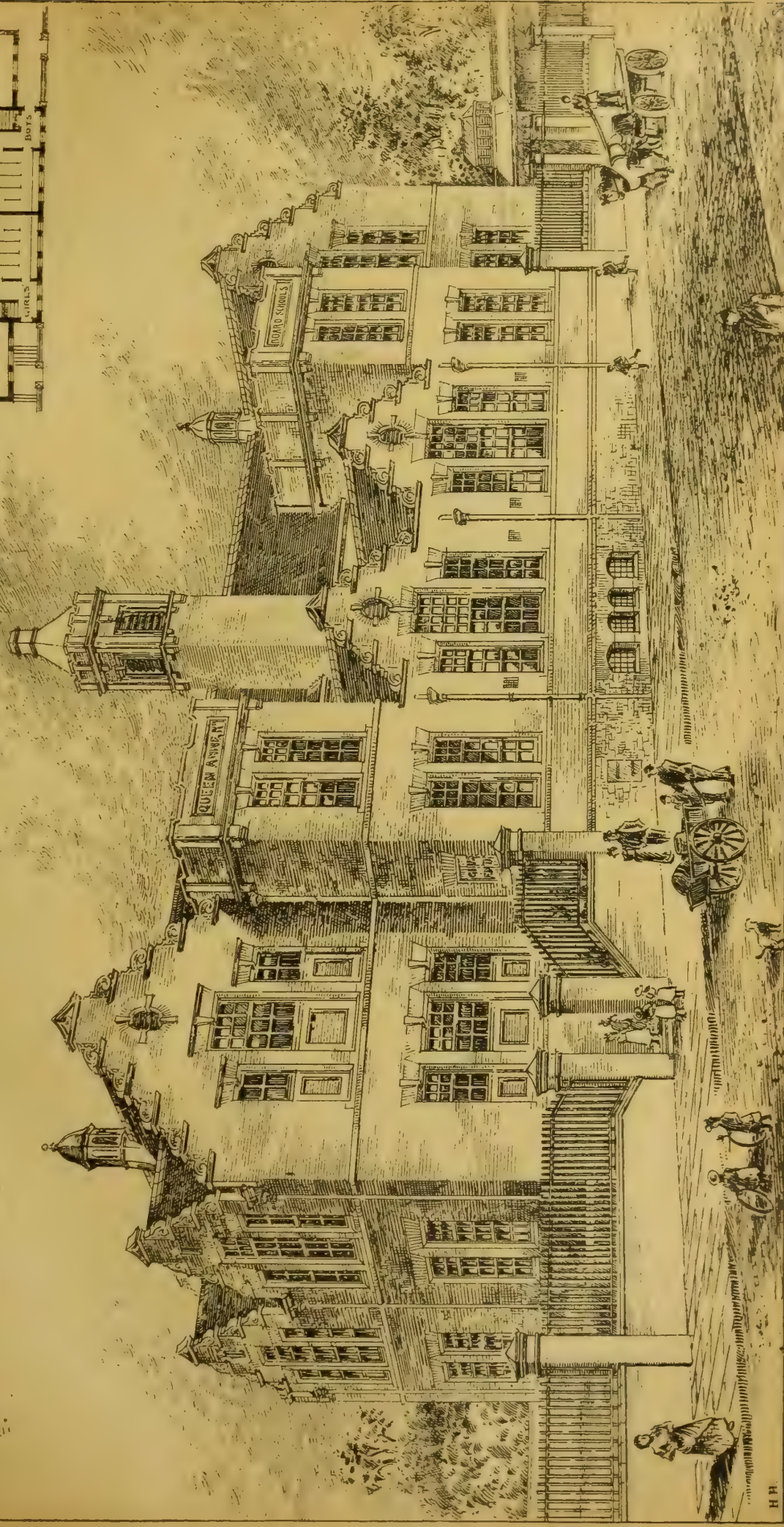
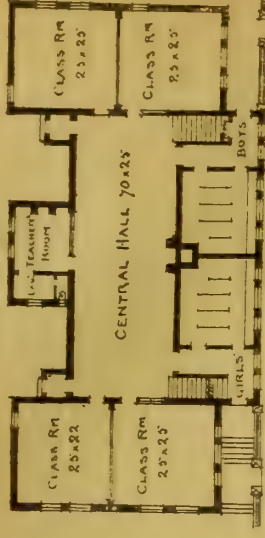








GROUND PLAN.



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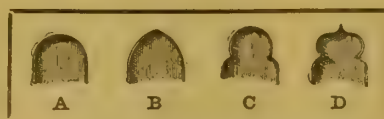
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## CONTENTS.

Work for the New Year .....	1
Architectural Progress .....	2
Art in Brickwork .....	3
Destructive Restorations at Old Cairo .....	4
Classic Details and their Application .....	4
Cast Iron in Builder's and Contractor's Work.—XII.....	5
County Lunatic Asylums.—XXXVII.....	7
Obituary .....	8
The Building News Directory .....	XXI.
Our Illustrations .....	45
Competitions .....	46
Strength of Bridge and Trestle Timbers .....	47
Notes from Edinburgh .....	48
Building Intelligence .....	49
Correspondence .....	49
Legal .....	50
Legal Intelligence .....	50
Water Supply and Sanitary Matters .....	50
Our Office Table .....	50
Meetings for the Ensuing Week .....	51
Tenders .....	51

## ILLUSTRATIONS.

"CHRISTIAN AND FAITHFUL PASSING THROUGH VANITY FAIR."—THE ADELPHI BANK, LIVERPOOL.—"COLD HARBOUR," LIPHOOK.—ROYAL ACADEMY GOLD MEDAL DESIGN FOR A LARGE CHURCH.—CORTILE OF THE PALAZZO BALBI, GENOA.—ALL SAINTS' CHURCH, SWANSCOMBE, KENT.—"THE HALLAMS," SURREY.—NEW ORGAN, ST. PAUL'S CHURCH, BURTON-ON-TRENT.—DOORWAY OF THE CONVENT OF S. SILVESTRO, GENOA.—THE "SEELY" PRESENTATION CASKET.—BARTON HILL BOARD SCHOOLS.

## Our Illustrations.

"CHRISTIAN AND FAITHFUL PASSING THROUGH VANITY FAIR"—NATIONAL BRONZE MEDAL AWARDED.

IN this decorative composition in black and white, Mr. Alfred Jones has cast his scene from Bunyan's "Pilgrim's Progress" somewhere in the Middle Ages. The design itself is capably conceived, and characteristically drawn. The busy gaiety of the street is admirably realised by the artist, with a well-managed balance of parts without too evident a set arrangement or lack of any sustained interest. The pleasures of sin are rightly more in evidence in such a picture than its penalties, and the boldness of Christian supporting the more diffident demeanour of his companion deservedly finds prominence. The well-known lines illustrated run thus:—Then I saw in my dream, that when they were got out of the wilderness, they presently saw a town before them, and the name of that town is Vanity; and at the town there is a fair kept called Vanity Fair . . . because the town where it is kept, "is lighter than Vanity"; and also because that all that is there sold, or that cometh thither, is Vanity. As is the saying of the wise, "All that cometh is Vanity." This fair is no new-erected business . . . at this fair are all such merchandises sold as houses, lands, trades, places, honours, preferments, titles, countries, kingdoms, lusts, pleasures, and delights of all sorts as whores, bawds, wives, husbands, children, masters, servants, lives, blood, bodies, souls, silver, gold, pearls, precious stones, and what not? And moreover, at this fair there is at all times to be seen juggling, cheats, games, plays, fools, apes, knaves and rogues, and that of every kind . . . The pilgrims were clothed with such kind of raiment as was diverse from the raiment of any that traded in that fair. The people, therefore, of the fair made a great gazing upon them; some said they were fools; some they were bedlams; and some they were outlandish men . . . One chanced mockingly, beholding the carriages of the men, to say to them, "What will ye buy?" But they, looking gravely upon him, said, "We buy the truth." This led to a hubbub, and finally, it will be remembered, a trial, the jury being Messrs. Blindman, Nogood, Malice, Lovelust, Live-loose, Heady, High-mind, Enmity, Liar, Cruelty, Hate-light and Implacable. Faithful was in the end burnt at a stake, but his companion, Christian, escaped.

ADELPHI BANK, LIVERPOOL.

A CONSIDERABLE portion of Castle-street, Liverpool, facing the town hall, has been rebuilt in recent years, and the bank illustrated is one of the newest blocks at the corner of Castle-street and Brunswick-street. The materials used are granite in the plinth, and an admixture of Corsehill and

Ketton stones in the upper parts. The interior of the bank is in marble, with a modelled plaster ceiling, and oak fittings. The contractors were: for the basement and sub-basement, Mr. E. Gabbutt, of Liverpool; for the superstructure, Messrs. Roberts and Robinson, of Liverpool; for the bank fittings, Messrs. Dart, of Crediton. Mr. W. D. Caröe is the architect.

"COLD HARBOUR," LIPHOOK.

THIS is a proposed addition to the house which was erected at Liphook, for Sir Thos. Sutherland, the Chairman of the Peninsular and Oriental Steam-Navigation Company, in 1889, Mr. T. E. Colclutt being the architect.

DESIGN FOR A LARGE TOWN CHURCH.

To this design, by Mr. Thomas Geoffrey Lucas, for the interior of a large town church, the Royal Academy Gold Medal was awarded.

CORTILE OF PALAZZO BALBI, GENOA.

GENOA, the keynote of North-Western Italy, is surpassed by no place more imbued with the characteristic charms and colour of that country, for its beauty is typically embodied in Genoa, "La Superba," well termed "the queenly city," with its streets of palaces rising tier above tier from the water, girdling with the long lines of its bright white houses, the vast sweep of its harbour, the mouth of which is marked by a huge natural mole of rock, crowned by its magnificent and well-known lighthouse towers. The white houses of Genoa rise out of a mass of fig, and olive, and orange-trees, the glory of its old patrician luxury. Among these, none possess a more lovely cortile than the Palazzo Balbi, which furnishes the name to the most striking street in Genoa. This house is still the most comfortable and well-furnished of all the Genoese palaces. The cortile is inclosed by triple rows of slender columns, through which a brilliant orange-garden is seen. It is inhabited by a family who reside in the upper part of the building; but permission is generously given to strangers allowing them to see the Palace, which contains in the great hall and gallery several remarkable old masters, including Vandyke, Guido Reni, Titian, Carravaggio, and Annibale Caracci. The collection is considered among the most important in Genoa. The Palace was erected in the early years of the 17th century, from the designs of Bartolommeo Bianco, whose work is represented in our illustration to-day. It stands next the famous Palazzo dell Università, which is approached from its cortile by a magnificent staircase guarded by most grand lions. The palace has a natural history and a botanical garden. The arcades are similar in design to those of the Palazzo Balbi. At the end of the street is the Piazza Acqua Verde, adorned with a monument of Columbus, erected in 1862, and facing it is the railway station. Not a few of the Genoese palaces, for the lack of a better material, are constructed of rubble stone and stuccoed over, often without any ornament, save perhaps to the doorways and cornices, all the architectural adornment being painted on the plaster, or in those of the better class, the ornament itself is done in stucco. Sometimes the result is vulgar, and a good deal, which at first sight looks like marble, is not so, but only painted in imitation. Fergusson has with justice pointed out the badness of the material, the coarseness, and frequently the incongruity of the details accentuated by gross crudeness, approaching vulgarity both in colour and form. He adds, very appreciatively, however, "if, in addition to these defects, the 'Orders' had been allowed to govern the designs to the extent they were made to do so in other cities, the effect would have been most painful; but because they are palaces, and palaces only, and because their windows, their doors, and, above all, their cornices, are in their right places and in due subordination to one another, all these defects are overlooked, and the impression the Genoese palaces generally produce is one of almost unmitigated admiration."

ALL SAINTS' CHURCH, SWANSCOMBE.

THE Church of All Saints, Swanscombe, is near Northfleet, and has been built at the sole cost of Messrs. Bazley White and Co., chiefly for the use of the workmen employed in their large cement works. In general character it aims at following the lines of the Kentish churches of that district. It is built of knapped flint, with dressings of Bath stone, and is extremely solid and well-built throughout. The roofs are open internally, and are stained dark green. An elaborate pulpit in

walnut, made by Messrs. Farmer and Brindley, is an additional gift of the senior member of the firm. The choir stalls, of walnut, are plain, but solid. A good deal remains to be done to what is called "finish"; but all that has been done is good and substantial. Doubtless in future years bit by bit will be added till the work is complete. The church was built by Mr. Thomas Boyce, who has certainly done very sound work throughout. The architect is Mr. R. Norman Shaw, R.A. The drawing is by Mr. Percy N. Ginhams.

"THE HALLAMS," SURREY.

"THE HALLAMS" is situated in a most beautiful country about two miles south of Chilworth, in Surrey. It is built of red brick, with the dark-coloured ironstone found in the neighbourhood worked in, in large, ragged patches. The overhanging portions are of oak. The whole is roofed with red tiles. The small plan in view shows the general distribution of the rooms. The hall is the whole height, extending through two stories. It has an open-timber roof, and is panelled with oak to a height of about 12ft., with a screen across, forming a very large gallery on the upper floor; a lofty bay window and a very wide open fireplace (which does not smoke) are its chief features. The interior of the house generally is very plain, the owner despoising anything approaching ornamentation or elaborate moulding; in spite of which very commendable taste, he has indulged in some rich oak doors in the Gothic style of 1820, which came from Arundel Castle. The work, which is excellent, has been carried out by Messrs. R. Estcourt and Son, of Gloucester, under the superintendence of Mr. T. G. Wood. The heating, plumbers' work, electric bells, and electric-light wiring were done by Messrs. Wenham and Waters, of Croydon. The architect is Mr. R. Norman Shaw R.A. The drawing is by Mr. Archibald Haswell Christie, and, like the before-named picture, it was exhibited at the Royal Academy last summer.

ELECTRIC ORGAN, ST. PAUL'S CHURCH, BURTON-ON-TRENT.

THE organ-case was designed by Mr. G. F. Bodley, A.R.A.; it fills the whole of the end of the south transept, and is of considerable dimensions. Colour is an important element of the design, the whole being painted, and the carving richly gilded. The instrument is played by the electric action, hence the absence of any place for the player: he sits, quite away from the case here represented, in a choir aisle. The width of the case is about 24ft. There is a choir organ in the chancel, with an oak case. The whole organ was given by Lord Burton. The case was executed by Mr. H. R. Franklin, of Deddington, Oxon, and the drawing from which our illustration is taken was shown last summer at the Royal Academy Exhibition.

DOORWAY TO THE CONVENT OF S. SILVESTRO, GENOA.

IN this city of palaces, a veritable museum of historic architecture, the more humble streets, reeking with odours drawn from Parmesan and Gruyère cheese and Bologna sausages, may escape inspection by the tired or superficial visitor; but if thereby much unaccountable filth and many unusual smells are avoided, it is certain that not a few exceedingly interesting examples of suggestive design will also be overlooked. The architect, at least, should not fail to explore these regions. The disorderly jumbling of dwellings, one piled up on the top of the other, the passages more squalid and more dense than any in old Paris, or, for that matter, in St. Giles's, in and out of which not vagabonds, but well-dressed women, with white veils and great fans, are passing and re-passing; the entire absence of any resemblance of any dwelling-house or shop, or wall, or post, or pillar to anything one has ever seen before; and the disheartening dirt, discomfort, and decay perfectly confound one. He is only conscious of a feverish and bewildered vision of saints and Virgin's shrines at the street corners; of great numbers of friars, monks, and soldiers; of red curtains waving at the doorways of churches; of always going uphill, and yet seeing every other street and passage going higher up still; of fruit stalls, with fresh lemons and oranges hanging in garlands made of vine leaves . . . The houses are immensely high, painted in all sorts of colours, and are in every state and stage of damage, dirt, and lack of repair. They are commonly let off in floors. There are few street doors; the entrance-halls are, for the most part,



looked upon as public property, and any moderately-enterprising scavenger might make a fine fortune by now and then cleaning them out. Such is the graphic scene depicted by Dickens in his "Pictures from Italy," and in just such a locality stands the Convent of S. Silvestro, from which we give a pencil study to-day in illustration of its main portal, dated 1707, very late, of course, in style, very free in point of treatment, rich and yet refined in detail, uncommonly handsome and undoubtedly modern, at least suggestive if not precisely worthy of imitation. There are a fine series of such handsome doorways of similar richness in the city, and some far purer in style, as, for example, the Renaissance side-door to the church of S. Siro, which succeeded S. Maria in Castello as the Cathedral of Genoa. Blackbirds are still allowed to build their nests unmolested in this church, from a tradition that S. Siro, as a boy, raised to life his pet blackbird, which he found dead one day on his return from school. Then there is another doorway of much earlier date to the far-famed house of Andrea Doria; "'tis in the heart of Genoa," and over the portal is a sculptured Gothic-like relief of St. George and the Dragon, done in the black slate marble of Lavagna. A pointed arched doorway enriched with egg-and-tongue mouldings, and having columns surmounted by Composite voluted capitals, deserves mention at the Church of S. Maria della Vigne; while, to conclude these notes, we may recall the exquisitely detailed and refined Renaissance doorway with arabesque fillings to the jamb pilasters of well-known beauty, though possibly, for that same reason, less likely to excite a passing interest, while the unusual commands attention, and the rococo obtains admirers, and so inspires the mode.

#### THE "SEELY" PRESENTATION CASKET.

THIS handsome casket, containing the certificate of enrolment, was recently presented, together with the freedom of Nottingham, to Colonel (now Sir) Charles Seely as a tribute to his charity, by the corporation of that borough. The body of the casket is of solid silver, designed in a late Renaissance style, and has a moulded plinth and four ornamental feet. It contains a series of enamelled shields, with the coats of arms of various sovereigns who have, at one time or another, been connected with the ancient borough. The shields are set in a richly-ornamented ground of repoussé work, various jewels being worked into the ornament. The coats of arms are those of William the Conqueror, John, Edward III., David II. of Scotland, Richard III., Charles I., Victoria, Henry II., Henry III., and Henry VII. The lid is surrounded by the legend, "Nottinghamensis recognitio nobilis charitatis civis," in raised letters of silver, and is otherwise richly embellished with jewelled repoussé work supporting the crest of Colonel Seely, three golden wheat-ears on a ground of royal blue enamel, and the coat of arms of Nottingham, the whole being crowned by an embossed jewelled knob or boss by which the lid is raised. The stones introduced are moonstones, onyx, catseyes, amethyst, carbuncle, cairngorms, &c. The stand is of Algerian onyx having a moulded edge, and containing four circular panels of lapis-lazuli, and a silver band let in all round, with an inscription in Lincoln green enamel as follows: "Presented to Colonel Seely by the Corporation with the honorary freedom of the borough of Nottingham, A.D. 1895." It was designed by Mr. Arthur Marshall, A.R.I.B.A., of Nottingham, and carried out under his supervision.

#### NEW MIXED SCHOOLS AT BARTON HILL, BRISTOL, FOR THE BRISTOL SCHOOL BOARD.

THESE schools, which were opened recently, form a new independent infant department in connection with the existing school. They accommodate 510 children in eight classrooms, four on the ground floor, and four over. A central hall, 70ft. long and 25ft. wide and 27ft. high, connects the two floors, the upper classrooms opening on to a gallery, which runs around three sides of the hall, and opens on to the staircases. Mr. F. Bligh Bond, A.R.I.B.A., was the architect of the school, the contract for which was £5,457. The contractor was Mr. John Perrott, of Bristol. The schools are built of brick, with facings of Cattybrook pressed brick, and dressings of freestone. All windows are provided with wooden frames, containing double-hung sashes, and swing casements over. The interior construction is fireproof. The heating apparatus, by Messrs.

Crispin, of Bristol, cost £289; and the ventilation is accomplished by an exhaust shaft placed in the tower, actuated by the heat of the flue from boiler.

#### COMPETITIONS.

LEIGH.—The Leigh Co-operative Society about a month since invited designs from Mr. Fred. Smith, architect, of Manchester, and from Mr. J. C. Prestwich, architect, of Leigh, agreeing to give an honorarium to the unsuccessful competitor. The committee of management selected the design submitted by Mr. Prestwich, and it is intended to at once clear the site of the existing buildings, and proceed with the erection of the new premises, which comprise eight departmental shops, being for grocery, butchery (beef and pork), confectionery, boot and shoe shops, clog and repair shop, furnishing, tailoring, and millinery, drapery and dressmaking shop, the latter being a large apartment 125ft. long, 36ft. wide, and four stories high. In addition to the various shops, and on the first floor, are spacious reading-room, library, and educational committee-rooms; ladies' and gentlemen's hat and cloak-rooms in communication with an assembly hall seating 1,200 persons. Arranged en suite with the large hall is a small hall, seating 400, intended for the smaller meetings of the society. A number of ante-rooms, dressing-rooms, and a supper-room are grouped round the two halls, available for use in connection with either hall. Workrooms will be provided for boot and shoe-makers, and tailors, milliners, and dressmakers. The several departments will be fitted with lifts worked by electric motors from a cable already laid, and the premises will be electric lighted throughout. The architect's estimated cost is £16,400. The architectural treatment is Flemish Renaissance, terracotta being largely used, with stone for the piers of the shop-fronts and other points of support, as being better adapted to bear the superincumbent weight.

LIVERPOOL.—A lengthy correspondence relative to the competition for the rebuilding of the City Northern Hospital has passed between Mr. Alfred Culshaw, president of the Liverpool Architectural Society, and the chairman and secretary of the hospital, and the secretary to the David Lewis Trust. Mr. Culshaw asked the board of the hospital to reconsider their decision to invite four architects, none of whom practise in Liverpool, to send in competitive designs for the proposed new building; to confine the competition to those four would be a distinct slight on the profession of the city, as there were a number of architects in Liverpool who were fully qualified to carry out that special class of building. In reply, the secretary to the David Lewis Trust stated that the sub-committee had agreed that a general competition was undesirable, and decided to limit its invitations to compete to architects who had recent and extensive experience in the designing of modern hospitals. If the Liverpool Architectural Association was prepared to put forward the name of any architect in Liverpool who would satisfy these conditions, the committee would be very happy to consider the question of the inclusion of his name. The secretary added that amongst the gentlemen who were first asked if they would be willing to join a limited competition was a Liverpool architect who had, the committee understood, had hospital experience; but he was unable to place his services at the disposal of the committee. Mr. Culshaw rejoined that the council of the L.A.S. thought it would be invidious to mention the names of any particular members of that body who might be better qualified than their colleagues, but suggested that a professional assessor of standing and known experience in this class of building, perhaps a non-local man would be preferable, should be appointed who could draw up the conditions and advise in the final selection of a design; that by advertisement the trustees should invite Liverpool architects to send in applications to compete, the applicants to state their qualifications. From them the trustees, with the assistance of an assessor, could make a selection, in addition to any architect already decided upon. To this an answer was sent reiterating that the committee had, after mature consideration, decided to issue invitations to compete only to architects who had actual and extensive experience in hospital designing. They had no wish to exclude members of the profession in Liverpool—quite the contrary—and regretfully came to the conclusion that amongst the practising architects of

Liverpool they could not find anyone, except one previously alluded to, who satisfied the preliminary requirements which had been unanimously agreed on by every member of the committee. In acknowledging this ultimatum, Mr. Culshaw pointed out that unless architects had opportunities afforded them, they never could attain the experience the committee insisted upon, and that there were several conspicuous instances of important buildings being erected from the design of architects, otherwise unknown, who had never previously produced an edifice of the kind.

#### CHIPS.

On the 21st of this month the *Guardian* completes its 50th year. With the paper of the following day—Wednesday, January 22—will be published a special supplement, containing a review of the origin and history of the *Guardian*, and articles on the attitude of the Church towards various questions in 1896 as compared with 1846.

New board schools for 500 children are about to be erected in Crow-lane, Golcar, near Huddersfield, from plans by Mr. J. Berry, of the latter town, the amount of the accepted tenders being a little over £4,000. The style will be Renaissance, and the mixed school is plain, with a central hall divided from five classrooms by sliding screens, with a separate infants' department of 140 places adjoining.

Two stained-glass windows have recently been placed in St. John's Church, Middlesbrough. They are from the studio of Messrs. Jones and Willis, of Birmingham, London, and Liverpool.

A new ward was opened at the Corbett Hospital, Stourbridge, on Wednesday. It has been constructed at the cost of Mr. John Corbett, of Impney, Droitwich, formerly member for Mid-Worcestershire. Mr. Corbett was the founder of the hospital which bears his name, and his present gift brings up his benefaction to it to over £13,000.

At Maiden Bradley, Wilts, after evensong on Christmas Eve, the vicar held a special service for the dedication of the bells. Four of the old bells have been recast, and a new treble added, all made to harmonise with the fifth bell, recast 1854, by the same firm, Messrs. Mears and Stainbank, of Whitechapel, so that now the ring consists of six bells. The bells have all been newly fitted, and hung in a frame of English oak. The cost amounted to nearly £300. The Duke of Somerset has given the new floor for bell-chamber and other repairs inside the tower, and the new bell is the gift of the vicar. The floors and repairs have been carried out under the direction of Mr. J. Carder. The weight of the tenor bell is 13cwt. 2qr. 7lb.

A report has been issued of the church-building, restoration, and enlargement in the diocese of Llandaff in the two years ending October 30, 1895, from which it appears that a total sum was spent in this work of £67,000, additional accommodation being provided for 7,756 persons.

A hammered silver altar cross, recently presented to Salisbury Cathedral, was used on Christmas Day for the first time. It stands upwards of 4ft. in height, and is of 16th Century date. It was originally a processional cross. Four saints are depicted—namely, St. Aldhelm (holding a model of his church), St. Osmund (with the Sarum Uss in his hand), St. Edmund, and St. Thomas of Canterbury. Round the base is a Latin inscription written by the Bishop of Salisbury.

Sir Augustus Harris's great show at Olympia demands more than the notice due to an ordinary entertainment. The great Winter Garden is a triumph of decorative comfort. It is just what one would see in a dozen different parts of London, especially during a season like this, when outdoor amusements are impossible. As for the spectacles, each is in its way perfect. The Derby Day is as amusing as it is realistic, and in the March to Chitral, and the subsequent defence of the fort and rescue, the incidents are as well conceived as they are faithfully illustrated. There is no wonder that Sir Augustus Harris has once more caught the verdict of public approval in his usual masterly fashion. Olympia is more than a great show—it is an educational and recreative exhibition of unparalleled interest, and the response of the public in their thousands is a just tribute to its promoter's genius.

The formal opening of the set of buildings which have been erected under the auspices of the Young Men's Christian Association, on a site facing High-street and Kirk Wynd, Kirkcaldy, in memory of the late Provost Swan, took place on December 27. Constructed in the English Renaissance style, from plans prepared by Mr. G. Washington Browne, A.R.S.A., Edinburgh, the buildings, of red stone from Dumfriesshire, rise to a height of three stories. There are lecture hall, reading-room, library, gymnasium, &c., the total cost of the undertaking being about £5,000.



## STRENGTH OF BRIDGE AND TRESTLE TIMBERS.\*

YOUR committee appointed to report on "Strength of Bridge and Trestle Timbers, with special reference to Southern Yellow Pine, White Pine, Fir, and Oak," desires to present herewith, as part of their report, the very valuable data, compiled by the chairman of the committee, relative to tests of the principal American bridge and trestle timbers, and the recommendations of the leading authorities on the subject of strength of timber during the last twenty-five years, embodied in the appendix to this report and tabulated for easy reference in the accompanying Tables I. to IV.

The uncertainty of our knowledge relative to the strength of timber is clearly demonstrated after a perusal of this information, and emphasises, better than long dissertations on the subject, the necessity for more extensive, thorough, and reliable series of tests, conducted on a truly scientific basis, approximating as nearly as possible actual conditions encountered in practice.

The wide range of values recommended by the various recognised authorities is to be regretted, especially so when undue influence has been attributed by them in their deductions to isolated tests of small-size specimens, not only limited in number, but especially defective in not having noted and recorded properly the exact species of each specimen tested—its origin, condition, quality, degree of seasoning, method of testing, &c.

The fact has been proved beyond dispute that small-size specimen tests give much larger average results than full-size tests owing to the greater freedom of small selected test pieces from blemishes and imperfections, and their being, as a rule, comparatively drier and better seasoned than full-size sticks. The exact increase, as shown by tests and by statements of different authorities, is from 10 to over 100 per cent.

Great credit is due to such investigators and experimenters as Professors G. Lanza, J. B. Johnson, H. T. Bovey, C. B. Wing, and Messrs. Onward Bates, W. H. Pinley, C. B. Talbot, and others for their experimental work and agitation in favour of full-sized tests. Professors G. Lanza, R. H. Thurston, and Wm. H. Burr have contributed valuable treatises on the subject of strength of timber. The extensive series of small and full-size U.S. Government tests, conducted in 1880 to 1882 at the Watertown Arsenal under Col. T. T. S. Laidley, and more recently the very elaborate and thorough timber tests being conducted by the U.S. Forestry Division under Dr. B. E. Fernow, Chief, and Professor J. B. Johnson, of Washington University, St. Louis, afford us to-day, in connection with the work of the above-mentioned experimenters, our most reliable data from a practical standpoint.

The test data at hand and the summary criticisms of leading authorities seem to indicate the general correctness of the following conclusions:—

1. Of all structural materials used for bridges and trestles, timber is the most variable as to the properties and strength of different pieces classed as belonging to the same species, hence it is impossible to establish close and reliable limits of strength for each species.

2. The various names applied to one and the same species in different parts of the country lead to great confusion in classifying or applying results of tests.

3. Variations in strength are generally directly proportional to the density or weight of timber.

4. As a rule, a reduction of moisture is accompanied by an increase in strength; in other words, seasoned lumber is stronger than green lumber.

5. Structures should be, in general, designed for the strength of green or moderately-seasoned lumber, of average quality, and not for a high grade of well-seasoned material.

6. Age or use does not destroy the strength of timber, unless decay or season-checking takes place.

7. Timber, unlike materials of a more homogeneous nature, as iron and steel, has no well-defined limit of elasticity. As a rule, it can be strained very near to the breaking-point without serious injury, which accounts for the continuous use of many timber structures with the material strained far beyond the usually accepted safe limits. On the other hand, sudden and frequently

## AVERAGE ULTIMATE BREAKING UNIT STRESSES IN POUNDS PER SQUARE INCH.

Recommended by the Committee on "Strength of Bridge and Trestle Timbers."—American Association of Railway Superintendents Bridges and Buildings.—Fifth Annual Convention, New Orleans, October, 1895.

KIND OF TIMBER.	TENSION.		COMPRESSION.		TRANSVERSE RUPTURE.		SHEARING.	
	With Grain.	Across Grain.	With Grain.	Across Grain.	Extreme Fibre Stress.	Modulus of Elasticity.	With Grain.	Across Grain.
White Oak	10,000	2,000	7,000	4,500	2,000	6,000	1,100,000	800
White Pine	7,000	500	5,500	3,500	500	1,000	1,000,000	400
Southern, Long-Leaf or Georgia Yellow Pine	12,000	600	8,000	5,000	1,400	7,000	1,700,000	600
Douglas, Oregon and Washington Yellow Fir	12,000	—	8,000	6,000	1,200	6,500	1,400,000	600
Fir or Pine	10,000	—	—	—	—	5,000	—	—
Northern, or Short-Leaf Yellow Pine	9,000	500	6,000	4,000	1,000	6,000	1,200,000	400
Red Pine	9,000	500	6,000	4,000	800	5,000	1,200,000	—
Norway Pine	8,000	—	6,000	4,000	800	4,000	1,200,000	—
Canadian (Ottawa) White Pine	10,000	—	—	5,000	—	—	—	350
Canadian (Ontario) Red Pine	10,000	—	—	5,000	—	5,000	1,400,000	400
Spruce and Eastern Fir	8,000	500	6,000	4,000	700	4,000	1,200,000	400
Hemlock	6,000	—	4,000	3,000	600	3,500	900,000	350
Cypress	6,000	—	6,000	4,000	700	5,000	900,000	—
Cedar	8,000	—	6,000	4,000	700	5,000	700,000	1,500
Chestnut	9,000	—	—	5,000	900	5,000	1,000,000	600
California Redwood	7,000	—	—	4,000	800	4,500	700,000	400
California Spruce	—	—	—	4,000	—	5,000	1,200,000	—

## AVERAGE SAFE ALLOWABLE WORKING UNIT STRESSES IN POUNDS PER SQUARE INCH.

Recommended by the Committee on "Strength of Bridge and Trestle Timbers."—American Association of Railway Superintendents Bridges and Buildings.—Fifth Annual Convention, New Orleans, October, 1895.

KIND OF TIMBER.	TENSION.		COMPRESSION.		TRANSVERSE RUPTURE.		SHEARING.	
	With Grain.	Across Grain.	With Grain.	Across Grain.	Extreme Fibre Stress.	Modulus of Elasticity.	With Grain.	Across Grain.
			End Bearing.	Columns under 15 Diam.				
Factor of Safety.	Ten.	Ten.	Five.	Five.	Four.	Six.	Two.	Four.
White Oak	1,000	200	1,400	900	500	1,000	550,000	200
White Pine	700	50	1,100	700	200	700	500,000	100
Southern Long-Leaf or Georgia Yellow Pine	1,200	60	1,600	1,000	350	1,200	850,000	150
Douglas Oregon, and Washington Yellow Fir	1,200	—	1,600	1,200	300	1,100	700,000	150
Fir or Pine	1,000	—	—	—	—	800	—	—
Northern or Short-Leaf Yellow Pine	900	50	1,200	800	250	1,000	600,000	100
Red Pine	900	50	1,200	800	200	800	600,000	—
Norway Pine	800	—	1,200	800	200	700	600,000	—
Canadian (Ottawa) White Pine	1,000	—	—	1,000	—	—	—	100
Canadian (Ontario) Red Pine	1,000	—	—	1,000	—	800	700,000	100
Spruce and Eastern Fir	800	50	1,200	800	200	700	600,000	100
Hemlock	600	—	—	800	150	600	450,000	100
Cypress	600	—	1,200	800	200	800	450,000	—
Cedar	800	—	1,200	800	200	800	350,000	400
Chestnut	900	—	—	1,000	250	800	500,000	150
California Redwood	700	—	—	800	200	750	350,000	100
California Spruce	—	—	—	800	—	800	600,000	—

inexplicable failures of individual sticks at very low limits are liable to occur.

8. Knots, even when sound and tight, are one of the most objectionable features of timber, both for beams and struts. The full-size tests of every experimenter have demonstrated, not only that beams break at knots, but that invariably timber struts will fail at a knot, or owing to the proximity of a knot by reducing the effective area of the stick and causing curly and cross-grained fibres, thus exploding the old practical view that sound and tight knots are not detrimental to timber in compression.

9. Excepting in top logs of a tree or very small and young timber, the heart-wood is, as a rule, not as strong as the material farther away from the heart. This becomes more generally apparent, in practice, in large sticks with considerable heart-wood cut from old trees in which the heart has begun to decay or been wind-shaken. Beams cut from such material frequently season-check along middle of beam and fail by longitudinal shearing.

10. Top logs are not as strong as butt logs, provided the latter have sound timber.

11. The results of compression tests are more uniform and vary less for one species of timber than any other kind of test; hence, if only one kind of test can be made, it would seem that a compressive test will furnish the most reliable comparative results.

12. Long timber columns generally fail by lateral deflection or "buckling" when the length exceeds the least cross-sectional dimension of the stick by 20—in other words, the column is longer than 20 diameters. In practice, the unit stress for all columns over 15 diameters should be reduced in accordance with the various rules and formulae established for long columns.

13. Uneven end bearings and eccentric loading of columns produce more serious disturbances than usually assumed.

14. The tests of full-size long compound

columns, composed of several sticks bolted and fastened together at intervals, show essentially the same ultimate unit resistance for the compound column as each component stick would have if considered as a column by itself.

15. More attention should be given in practice to the proper proportioning of bearing areas; in other words, the compressive bearing resistance of timber with and across grain, especially the latter, owing to the tendency of an excessive crushing stress across grain to indent the timber, thereby destroying the fibre and increasing the liability to speedy decay, especially when exposed to the weather and the continual working produced by moving loads.

The aim of your committee has been to examine the conflicting test data at hand, attributing the proper degree of importance to the various results and recommendations, and then to establish a set of units that can be accepted as fair average values, as far as known to-day, for the ordinary quality of each species of timber, and corresponding to the usual conditions and sizes of timbers encountered in practice. The difficulties of executing such a task successfully cannot be overrated, owing to the meagreness, and frequently the indefiniteness, of the available test-data, and especially the great range of physical properties in different sticks of the same general species, not only due to the locality where it is grown, but also to the condition of the timber as regards the percentage of moisture, degree of seasoning, physical characteristics, grain, texture, proportion of hard and soft fibres, presence of knots, &c., all of which affect the question of strength.

Your committee recommends, upon the basis of the test-data at hand at the present time, the average units for the ultimate breaking stresses of the principal timbers used in bridge and trestle constructions shown in the accompanying table.

In addition to the units given in the table,

\* Report of Committee of American Association of Railway Superintendents Bridges and Buildings, presented at Annual Convention, New Orleans, October, 1895.



## NOTES FROM EDINBURGH.

attention should be called to the latest formulæ for long timber columns, mentioned more particularly in the appendix to this report, which formulæ are based upon the results of the more recent full-size timber column tests, and hence should be considered more valuable than the older formulæ derived from a limited number of small-size tests. These new formulæ are Professor Burr's, App. I.; Professor Ely's, App. J.; Professor Stanwood's, App. K.; and A. L. Johnson's, App. V., while C. Shaler Smith's formulæ will be better understood after examining the explanatory notes contained in App. L.

Attention should also be called to the necessity of examining the resistance of a beam to longitudinal shearing along the neutral axis, as beams under transverse loading frequently fail by longitudinal shearing in place of transverse rupture.

In addition to the ultimate breaking unit stress, the designer of a timber structure has to establish the safe allowable unit stress for the species of timber to be used. This will vary for each particular class of structures and individual conditions. The selection of the proper "factor-of-safety" is largely a question of personal judgment and experience, and offers the best opportunity for the display of analytical and practical ability on the part of the designer. It is difficult to give specific rules. The following are some of the controlling questions to be considered.

The class of structure, whether temporary or permanent, and the nature of the loading, whether dead or live. If live, then whether the application of the load is accompanied by severe dynamic shocks and pounding of the structure. Whether the assumed loading for calculations is the absolute maximum, rarely to be applied in practice, or a possibility that may frequently take place. Prolonged heavy, steady loading, and also alternate tensile and compressive stresses in the same piece, will call for lower averages. Information as to whether the assumed breaking stresses are based on full-size or small-size tests, or only on interpolated values, averaged from tests of similar species of timber, is valuable, in order to attribute the proper degree of importance to recommended average values. The class of timber to be used, and its condition and quality. Finally, the particular kind of strain the stick is to be subjected to, and its position in the structure with regard to its importance, and the possible damage that might be caused by its failure.

In order to present something definite on this subject, your committee presents the accompanying table, showing the average safe allowable working unit stresses for the principal bridge and trestle timbers, prepared to meet the average conditions existing in railroad timber structures, the units being based upon the ultimate breaking unit stresses recommended by your committee, and the following factors of safety, viz. :—

Tension, with and across grain .....	10
Compression, with grain .....	5
Compression, across grain .....	4
Transverse rupture, extreme fibre stress .....	6
Transverse rupture, modulus of elasticity .....	2
Shearing, with and across grain .....	4

In conclusion, your committee desires to emphasise the importance and great value to the railroad companies of this country of the experimental work on the strength of American timbers being conducted by the Forestry Division of the U.S. Department of Agriculture, and to suggest that the American Association of Railway Superintendents of Bridges and Buildings endorse this view by official action, and lends its aid in every way possible to encourage the vigorous continuance of this series of Government tests, which bids fair to become the most reliable and useful work on the subject of strength of American timbers ever undertaken. With additional and reliable information on this subject, far-reaching economies in the designing of timber structures can be introduced, resulting not only in a great pecuniary saving to the railroad companies, but also offering a partial check to the enormous consumption of timber, and the gradual diminution of our structural timber supply.

WALTER G. BERG, Chairman,  
J. H. CUMMIN,  
JOHN FOREMAN,  
H. L. FRY,

Committee.

William Matkin, J.P., and secretary of the Carpenters' and Joiners' Union, was, at Liverpool, on Saturday, charged with being drunk and assaulting the police. He was fined 20s. and costs.

EDINBURGH has now for a long succession of years been favoured with a very equable degree of prosperity for the building trades. Wages have been good, and there have been no harassing strikes to secure advancement of wages. Generally, a yearly agreement is made, and loyally adhered to. The prospects of the coming year are promising the like results, as large contracts are being carried out, and will shortly be begun. Of these, the greatest in bulk is the reconstruction of the N.B. Railway. The foundations may be said now to have been laid, after a great work of demolition, and the inclosure of the additional ground obtained by the recent Act of Parliament. The area under the contractors' hands eastward of the North Bridge is about four acres, and the greater portion of the space has been arched over for the various superstructures required for the accommodation of the goods and passenger traffic. The central pier of the new bridge is slowly rising, and operations have been recently commenced to remove the lofty range of buildings, which, with the old bridge, will disappear, not greatly to the regret of any interested in the architecture of the city. The buildings now being removed were more or less of an anomaly, turning their backs upon the fine thoroughfare of Prince's-street with aggravation in their attitude, which, however, made manifest the wisdom of the city fathers, who saved Prince's-street from any further development of the buildings, which have remained in their rude and solitary grandeur, to be replaced by something more worthy of the city and the style of its architecture. The development of Prince's-street presents a curious study; but the most prominent characteristic of its metamorphoses, of late years, is the increasing altitude of the recent additions, which bid fair to rival any of the streets of the ancient city. The grounds at the back of the original houses are nearly all built up, many with buildings as lofty as those in front, and though not overcrowded with inhabitants, the saloons and offices must be in the greater number of cases badly ventilated and lighted. The nuisance of projecting shops is also on the increase; but, when this kind of alteration is tastefully treated, it can be a decided improvement to the aspect of the street. In this respect, George-street is by far the best in the city, and a large range of shop frontage recently added at the corner of Frederick-street is a model which many would do well to imitate. The projection, proportions, and details are all kept in excellent harmony with the neighbouring fronts, and, though some exception might be taken to the green and scarlet and gold of the decorator, this will soon lose its brilliancy and glitter. The city is still extending in all directions, mostly in tenements of houses for the industrial classes, for which there is at present a great demand, to make up for the demolition of similar dwellings in various parts of the city by the railway and improvement scheme of Provost Russel. High rents are easily obtained for very small houses; a house of kitchen and two rooms, all small, brings £15 easily, and £17 and £18. Great additions have been made to this class of houses in the Gorgie and Dalry districts, and also in the North Side. In the Dean Park houses the frontage is treated with good architectural detail, but the floor-space is very limited. Not much has been done in the way of suburban villas, and hardly anything at all in additions to the first-class houses. New schools are always being built, and the large one for the Broughton district has been evidently planted where it must be years before the immediate neighbourhood can have a population to support it. All other schools in the neighbouring districts are overcrowded, and when the new street which connects Broughton with Leith-walk is opened up, building may proceed more rapidly in the east than it has hitherto done.

The year has a good record in the churches built or building, church extension following closely, or anticipating, the extension of the city. Of these, the most interesting architecturally is the extensive additions being made to St. Mary's Roman Catholic Church, or pro-Cathedral. This was erected about 50 years ago, from a design by Gillespie Graham, who restored South Leith Church, and built the Victoria, or Assembly, Hall in Edinburgh. The architect had made a curious combination of old and Nonconformist Gothic. The building had nave, with clerestory and aisles, but no

chancel or sacarium. The dominant feature of the interior is the great width of the nave and low altitude of the ceiling. The building is not happy in being situated in a short and obscure street running between Leith-walk and Picardy-place, with a narrow lane on one side and high tenements close upon the other. It is orientated; but the altar end is at the west and the entrance from the east. The clerestory, like that of the old South Leith Church, is very low, and all the windows have their heads obscured by complicated Decorated tracery. The interior had a very dim religious light, and would have been greatly improved had the simple Lancet been adopted, and even then would not have been over-lighted. The clergy house, built where the chancel should have been, has lately been taken down, and a goodly-proportioned chancel, with aisles, erected, 30ft. to 40ft. in length. All details, with the exception of the tracery, are very plain, and follow those adopted in the nave. The opening into chancel has a lofty, plain, splayed arch, with angle-pillar, and a rather clumsy corbel-pillar. The addition of the chancel is a vast improvement to the interior, and makes the defective proportions of the nave much less prominent to the eye. The church has space enough in front to allow of the erection of an octagonal baptistery, which is nearly ready for the roof, and it is in contemplation to add a steeple on the opposite side where the ground is ample enough. These additions, with the porch recently built, will completely, or nearly so, eliminate the Nonconformist aspect of the original.

Beyond the limits yet reached by the extension of the city, in the line of the Gorgie-road, another large church is being built for the same denomination. It is of the orthodox Gothic type, with lofty nave, clerestory and aisles, and chancel of short proportions. The style is Early English Decorated, but without any of the costly mouldings characteristic of some examples. The nave has six bays, and the pillars are very elegant, with centre main and angle pillar attached. The roof is carried on iron principals, and will have a boarded vaulted ceiling. The entrance is to the south, where there is a good Geometric window, and a tower of good proportions, carried up to the height of the ridge.

In the same road and nearer the city, the Free Church of Gorgie is building, in Early Decorated Gothic. It also has nave, with clerestory and aisles; the nave terminated with triangular apse. The clerestory is lighted with cusped lancet triplets. The aisle windows have lintels, decorated with double oggee soffits instead of cusps; but the effect is not happy, and makes the stone look weakest where fracture most commonly occurs. The nave is very wide, with narrow passage aisles, and very short, with only three bays. This arrangement of wide nave and narrow aisles is seldom satisfactory, unless the length is considerable, which it can only be in larger churches. Another and larger edifice, of somewhat similar type, is building for the Mary-side district. St. Mark's Established Church, and other churches are proposed to be erected to meet the requirements of the increasing population.

The McEwen Hall is still in hands of the decorators, and when finished is expected to be one of, if not, the finest in the country. Its proportions are unique, the length being a mere fraction of the width and height, which are about equal. The floor, indeed, has been raised some 4ft., which is an improvement, as the platform is now more suitable in its height above the floor for the restricted length in front of it. The installation of the electric light appears to be likely to prove a great success. The report of the consulting engineer to the committee announces the existence of a profit adequate to reduce the cost to the consumer. Prince's-street, when fully lighted is light as day, but makes the darkness more visible on the opposite side. Great numbers of shops are using the incandescent lights, and a new main is being laid to meet the demand, which is greater, at this early stage, than was ever anticipated. The incandescent gas-light is also being largely adopted, and many prefer it as a light for private apartments.

The Polytechnic Institutes of Battersea and Chelsea, following the example set by the managers of the Carpenters' Company's Schools in Great Titchfield-street, W., have agreed to admit to all their building trade classes all architectural students nominated by the committee of the Architectural Association.



## Building Intelligence.

**CHEDISTON.**—The parish church of Chediston, near Halesworth, East Suffolk, has been undergoing extensive repair and renovation for some months past, and was reopened on Monday week. The church is a plain flint building of Early English style, and consists of a chancel, nave, south porch, and west tower, with a private chapel less than 200 years old and modern vestry. The recent work consists of the restoration of the tower and the whole of the windows of the church, including reglazing. The church has also been replastered with rough stucco. The architects were Messrs. Bottle and Olley, Yarmouth, and Mr. G. E. Hawes, Norwich, was the contractor, the cost being about £700.

**CINDERFORD.**—The Forest of Dean School Board have just opened their tenth school at Cinderford. The new building is for a mixed school, and for the higher standards. It is erected on the Double View estate, and on the main road to Littledean. The architect is Mr. J. P. Moore, B.A., Gloucester, and the contractor Mr. H. Freeman, of Cinderford. The school will accommodate 600 children, and the rooms are laid throughout on the wood-block system. The contract price was £3,980, equal to about £7 per head of the accommodation.

**IPSWICH.**—The first completed section of the new Church of St. Bartholomew, on the Rose Hill Estate, built at the cost of Mrs. Spooner as a memorial to the late John Chevalier Cobbold, for many years M.P. for the borough, was consecrated last week. Mr. Charles Spooner, 50, Queen Anne's-gate, S.W., was the architect, and Mr. S. Parmenter, Braintree, has been the contractor. Up to the present the amount expended has been about £5,000, and the portion of the church at present completed affords seating for about 500 persons. When finished, the church will consist of nave, with north and south aisles, chancel, morning-chapel or south chancel aisle, with priest's vestry and ambulatory, and sacristy, with a tower 8 ft. high at the north-east corner of the nave.

**TROON, N.B.**—The new parish church of Troon was opened on Dec. 26th. The church is 13th-century Gothic in style, from designs by Mr. Hippolyte J. Blanc, A.R.S.A., architect, Edinburgh, and the memorial stone of the building was laid rather more than two years ago by the Duke and Duchess of Portland.

### CHIPS.

Alterations are being made to St. Patrick's Schools, Blackfriars, embracing the ventilation, which will now be carried out on the Boyle system, four of the latest improved patent self-acting air-pump ventilators being adopted for the extraction of the vitiated air.

The Bank of Liverpool's new premises, at Liverpool, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A five-light window at the west end of Holy Trinity Church, Swansea, has been fitted with stained glass. The style is Perpendicular. Messrs. Wilson and Moxham, of Swansea, are the architects, and Mr. R. J. Newbury, of Fitzroy-square, W., is the artist.

A Local Government Board inquiry, to consider the application of the Rural District Council of Raunds for sanction to borrow £5,000 to cover the cost of the new sewage purification scheme, was held on Friday. The system proposed to be adopted is that of Mr. Ives, C.E.

An adjudication in bankruptcy has been made in the case of Robert Avis (trading as Robert Avis and Co.), Cedar-lodge, Putney Bridge-road, S.W., and Brewhouse-lane, Surrey, builder and contractor.

A group of public offices, including municipal buildings, free library, and science and art rooms, are approaching completion at Falmouth. The cost has been £22,000, of which £2,000 has been given towards the free library by Mr. J. Passmore Edwards, and another £2,000 was bequeathed by the late Mr. Ferris. The buildings were designed by Mr. W. H. Tressider, borough surveyor of Falmouth, in conjunction with Mr. F. J. Bellamy, and are faced with Plymouth limestone, Cornish granite being used for dressings. Plans and an elevation were given in the *BUILDING NEWS* for April 13, 1894.

### TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the *BUILDING NEWS*, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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### NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., and LXV. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—F. J. T.—W. D. and Co.—Cestus.—E. B.—A. Rogers.—C. O. (Newcastle).—Competitor.

## Correspondence.

### QUARRY-WORKED STONE.

To the Editor of the *BUILDING NEWS*.

SIR,—As a quarry owner, and one who has for a considerable number of years carried out some extremely large contracts in quarry-worked stone, I was amazed to read the letter on p. 908 in your issue of 20th Dec., signed by "A Mason who has Put in Some of these Pieces." I do not know in what yard he has worked, nor what stone he has thus pieced, nor what job has been been thus "jerry built"; but, in my experience, I can safely say and can prove, not only from my own, but my customers' experience, that, beyond the shadow of a doubt, quarry-worked stone is invariably worked better, truer, and cheaper, and is, in every sense, more satisfactory than stone worked in masons' yards in London, or any other town where the stone has to be used, and this arises from various circumstances, some of which are as follows:—

(1) The value of the raw material at the quarries is not so great as when delivered at the town where it is to be used; the consequence is (as I know of my personal knowledge) that in towns, if an error arises in working the stone, the mason is tempted, in consequence of the increased cost of the raw material, to patch and piece the stone to make it do; whereas the quarry owner, because his stone at the quarries is not so expensive, and because he has a much larger reputation, both for his stone and himself, to make or to mar, places the stone on one side.

(2) Because a mason in the town where the stone has to be used buys as little of the stone to be used as possible, because his profit is not made on what material he uses, but on what raw material he saves. Consequently, if a block opens unsatisfactorily, or there is a rough portion on that block, he is tempted to use it notwithstanding, and probably also claims a reduction from the

stone merchant. Whereas the quarry owner, for the sake of the reputation of his stone, would put it on one side altogether, or work it in for some less important job, which would come on later on, whereas the mason might not have another job in similar stone for some considerable time, so the stone would lie on his hands as dead stock for some considerable time. I could multiply these reasons very considerably; but the above will suffice for the present. But the strongest argument in favour of quarry-worked stone in my opinion is this: That architects do at least know they are getting the stone they specify, and, I maintain, the best of it. I am only speaking what I know when I say that there are jobs in London and elsewhere where a red stone has been specified, and Bath stone dyed red has been used instead of the stone the architect wished. This statement I make on the authority of a mason who has played such a trick, as he told me himself.

Again, we hear of different sorts of York stone being specified, and the mason using an entirely different material. Again, and I give it on the authority of a much-sought-after and highly valued expert on building stones in London, that in very many cases (not a few) French and other stones are used by London masons instead of some of the well-known English ones which have been specified by the architect! We also hear, not infrequently, of Portland stone being specified and other stone used. There have been cases of this sort happening in London during the past 12 months, all of which would have been avoided had the architects have had the stone quarry-worked. For no man in the red stone district would dream of importing Bath stone and staining it and selling it for red stone, neither would any quarry owner dream of importing French stone and palming it off as his own, nor would a Portland stone merchant dream of importing Beer stone, manipulating that and palming it off as his own!

However rough, therefore, may be the actual working of quarry-worked stone (and I submit it is the reverse), that is more than compensated for from the fact that architects can rely that they do receive the material which they desire, and I can prove it is also better worked.

In conclusion, I have no doubt that masons in London and elsewhere are quite able to "doctor" their stone in the same way that the mason writing you says quarry owners piece their stone. I was (in the presence of an expert) examining the stonework of an important public building only recently, and we found in many cases that the stone which had been worked in London, had been stopped, pieced, and in some instance what should have been ashlar stops were actually formed of a concrete material composed of stone-dust apparently, a little yellow ochre, and shellac! Was the secret of thus "doctoring" the stone brought from London to the country, or was it carried by the country yokel into London? I leave it for "A Mason who has Put in Some of these Pieces" to enlighten us.—I am, &c., FAIRPLAY.

Plans have been adopted for the extension of the Ulster Eye, Ear, and Throat Hospital at Belfast. New closets and bath-rooms, day-rooms, a laundry, better accommodation for nurses and servants, several small wards, and a new operating-room will be provided. The special feature of the addition will be the new operating-room. The floors and walls will be all tiled and cemented, so that no dust, dirt, or germs can have a hiding-place. The committee have in hand available for this extension between £1,400 and £1,500.

The largest steel arch bridge of single span that the world has yet seen is to be constructed immediately at Niagara Falls; in fact, part of the foundation work is already begun. It is intended to supersede the present suspension bridge, which has a long swing in the gales, to the alarm of all passengers. The span will be nearly 900 ft., and the arch will spring from masonry carried down to the water's edge. Mr. E. C. Buck is the engineer.

A porch has been lately erected at the south door of the parish church of Chalfont St. Giles, in memory of the late Mr. Samuel Sandars, of Chalfont Grove, and De Vere-gardens, W. The porch, which is of oak, was made by Messrs. Webster and Canon, of Aylesbury, from designs by Mr. John Oldrid Scott. The style is Late Fifteenth Century all through. The tracery at the sides has been glazed for protection from weather, but the front is open. The carving is by Mr. Tuttle, of Grantham, with the exception of the figure of St. Giles, which was carved by Mr. Robert Bridgeman, of Lichfield.



## Legal.

### A YEAR'S FAILURES.

**T**HE Statistical Abstract of Failures and Bills of Sale during 1895, published by *Kemp's Mercantile Gazette*, is an interesting paper. It shows that trade and business generally have certainly improved during the last year; the decrease in the total number of bankruptcies, deeds of arrangement, and bills of sale being most remarkable as compared with the year preceding. Taking England and Wales alone, we have the following figures:—Total bankruptcies in 1894, 4,801; in 1895, 4,400; decrease, 401. Total deeds of arrangement in 1894, 4,175; in 1895, 3,740; showing a decrease of 435. Total bills of sale in 1894, 9,867; in 1895, 9,860; giving a decrease of 907. These results are very satisfactory, and they give a reduction of about nine per cent. all round, which is certainly remarkable. The farmers who fail still increase, and it is curious that this should also have occurred in the grocery and provision trades, and in printing and stationery. But the improvement in the totals is most encouraging as a sign of returning prosperity.

Turning to the table dealing with separate trades, we find special cause for congratulation in the figures for the building and timber trades. Here the total number of Gazetted failures in the United Kingdom was only 611 for 1895, as compared with 714 for 1894, which shows a decrease of 103 cases, and is a greater proportionate improvement than in any other trade specified. Turning to deeds of arrangement, we find the figures for 1894 were 449, and for 1895 337, giving a falling off of 112 cases, a still better result and a larger proportion than shown in any other business. In regard to bills of sale also we find much the same thing, the building and timber trades only returning 645 bills of sale given in 1895, as against 738 for the year preceding, or a decrease of 93. Somewhat similar results are obtainable by comparing the statistics for the allied trades—such as the hardware and metal trades and the iron and steel trades, so that altogether the outlook for 1896 is far more promising of prosperity than has been the case for many years past.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.O.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

G. L. W.—SPECIFICATION.—TILES.—PRIME COST.—The prime cost here would be the cost of the tiles at the works, and it is inserted to show the quality of the article to be used.

### CHIPS.

Sir Matthew White Ridley has appointed Miss Rose E. Squire as Female Inspector of Factories and Workshops under the Home Office. She has for two years been engaged as sanitary inspector under the Vestry of St. Mary Abbott's, Kensington.

The dissolution of partnership is announced of E. A. Reynolds and W. Bartholomew, sanitary engineers, Belvedere-road, Lambeth, trading under the style of B. Finch and Co.

The Committee of Management of Aberdeen Art Gallery have been obliged, upon a report by Mr. A. Marshall Mackenzie, A.R.S.A., architect, to proceed to renew the heating apparatus in the Gallery at considerable cost.

The recipients of birthday honours include, besides the accomplished President of the Royal Academy, who has, since his appointment to that position in 1878, been successively created a knight, baronet, and peer; Sir W. T. Lewes, for many years the general manager of the Marquess of Bute's estates, docks, railways, and collieries in South Wales, who becomes a baronet; Professor Joseph Prestwich, the octogenarian geologist and water engineer, who receives knighthood; Mr. Frederick John Johnstone, secretary and chief engineer to the Public Works Department of the Bengal Government, created a C.S.I.; and Captain John Irvine Lang, R.E., who is decorated with the C.M.G. for services rendered in connection with the railway survey and delimitation of the Gold Coast Colony.

The date of the Imperial census (for London only) in connection with the Equalisation of Rates Bill, has been fixed for Sunday night, March 29. The object in taking this census is to ascertain the population of the sanitary districts of the Metropolis.

### LEGAL INTELLIGENCE.

**ALLEGED MAN OF STRAW CLIENT.**—At Bow-street, before Sir John Bridge, Kent Pinchbeck, architect, of York-buildings, Adelphi, and of St. John's, Woking, and Alexander Martin, clerk, of St. George's-road, Leyton, have again been charged, on remand, with conspiring to defraud by obtaining goods on false pretences. William James Lark, of the firm of Lark and Sons, builders, said that, in consequence of a letter he received from Pinchbeck, he entered into a contract with him to perform some building work. Pinchbeck told him that the work was done for Mr. Miles Atkinson, a wealthy gentleman, who had £5,000 lying at the bank ready to invest. The work was now partially completed, and witness had made several applications for the payment of the money due to him under the agreement, but Pinchbeck had always been out when he called; and Martin assured him that the money would shortly be paid. Over £218 was now due to him. Charles Eames, a builder, of Watford, and Ernest F. Scanlon, of the firm of Scanlon and Hayes, builders, Richmond, deposed that they, too, had received orders from Pinchbeck to erect houses for Mr. Atkinson. Some money had been paid on account in each case, but there was still £370 due to Mr. Eames and £254 due to Messrs Scanlon and Hayes for work done. In the latter case a writ had been issued against the defendant Pinchbeck for the recovery of the money, and proceedings were still pending. The further hearing was adjourned, bail being granted to Martin in one surety in £500.

**DEMOLITION UNDER BUILDING BY-LAWS IN LEEDS.**—Mr. C. M. Atkinson, the stipendiary magistrate for Leeds, gave his decision on Monday in reference to a prosecution instituted by the corporation of that city against Mr. George Cooke, butcher, Otley-road, Headingley, who was alleged to have committed certain breaches of the by-laws in regard to the erection of buildings. Defendant's plans were disapproved by the Building Clauses Committee; but he, notwithstanding this disapproval, proceeded with the erection of new premises in Wood-lane, and the corporation sought for an order for the demolition of the same, and also for penalties for the infringement of by-laws caused by the erection of buildings of which the plans had not been approved. The arguments were concluded on Wednesday, Dec. 18. The stipendiary now refused to order the demolition of the buildings; but in reference to the second information he imposed a penalty of £3. No evidence was tendered, the stipendiary said, to establish that defendant's plans were otherwise than strictly conformable to the statutes and by-laws in force in the city, and no attempt was made to justify the refusal of the committee to pass the plans. It might be said that the buildings should be demolished because they were erected without consent; but such a construction of the statute would work in many cases a manifest injustice. Reading the local act by the provisions of the general Acts in force throughout the kingdom for the regulation of the Public Health Act, and the first principles of natural justice, he thought he was not empowered to make the order sought.

### WATER SUPPLY AND SANITARY MATTERS.

**METROPOLITAN WATER SCHEMES.**—Among the private Bills which are to be brought forward in Parliament next Session is one promoted by the New River Company for the execution of extensive new works, and the enlargement of existing ones. The proposals include the widening of portions of the New River on both sides, the sinking and construction of six new wells and pumping stations in Hertfordshire, a new storage reservoir at Enfield Chase, a subsiding reservoir at Wood-green, and the enlargement of the service reservoir at Hampstead. The Southwark and Vauxhall Water Company also propose the execution of new works. The West Middlesex Waterworks, Grand Junction Waterworks, and New River Companies jointly promote a Bill for the construction of new reservoirs at Staines and for other purposes.

Alterations are being made to Rhewl school, also to Bodesden school, from the designs of Mr. G. A. Humphreys, architect, Llandudno. Special consideration has been paid to the ventilation, which will now be carried out on the Boyle system, consisting of their patent self-acting air-pump ventilators for the extraction of the vitiated air, and their latest improved air-inlets for the admission of fresh air.

A large clock has just been fixed in the Free Church at Cruden, Aberdeenshire, by John Smith and Sons, Derby. The bells upon which the hours are struck have been distinctly heard three miles away. Messrs. John Smith and Sons have also just completed a large clock and chimes at Horton Pagnell Church, near Doncaster, which was formally dedicated by the Archbishop of York and started by the giver, Mrs. Warde-Aldam, on the 27th of December.

## Our Office Table.

A PAMPHLET just issued by the Burlington Fine Art Club embodies the results of a year's researches by a test committee into the action of light and moisture on water-colours. The tests were made upon colours exposed under ordinary glazed frames, and frames in which the air was kept dry by means of caustic lime. Out of seventeen pigments examined, nine triumphantly withstood the dry-frame test, and four proved comparatively reliable. Only five survived under the ordinary frame. The nine which could stand dry air were aureolin, Indian red, madder brown, madder carmine, madder purple, French blue, indigo, sepia, and a mixture of indigo and Indian red. Cadmium yellow survived the ordinary frame test, but was slightly faded in the dry air. Vermilion, gamboge, and Indian yellow came badly out of both; but the worst of all, as was to be expected, was crimson lake.

The stations proposed for the Central London Railway have been under consideration of the L.C.C.'s engineer, and improvements in the plans have been suggested and approved. These refer to stations at Queen's-row, Oxford-circus, and Chancery-lane, and the Council have agreed to the plans. The company's engineer has agreed to the modifications required by the Council for Holland-park, Notting Hill-gate, Marble Arch, Tottenham Court-road, and Bloomsbury stations. We hope the architectural arrangements and design of these buildings and their approaches will be somewhat improved on the present railway stations, and be worthy of their situations. The stations on the Electric Railway between the City and Stockwell are, externally at least, more of the kind of structures we should like to see.

MR. J. R. MORTIMER, of Driffield, has made an examination of certain grave mounds on a farm at Danesdale, near Driffield, and has reported upon them to the East Riding Antiquarian Society. The mounds attracted the attention of Leland, and Sir William Dugdale in 1666 visited them and made a long entry concerning them in his book of arms in the Herald's College. Mr. Mortimer observes that a double line of British intrenchments ran along the northern margin of the graves, and extended for miles both in an eastern and western direction. The southern side of the hollow, Danesdale, which the graves occupy, was covered with an accumulation of chalk gravel not worn by water. In the one interment he found a small calvarium, which was long and narrow, and had apparently belonged to a female. The barrow which covered this interment was about 15ft. in diameter and 24in. high. No relic was found. A second body was also near the centre of a small mound about the size of the last, and not more than 3½ft. from the top. Near the right leg were the humerus of a small pig or goat, and portions of a crushed food vase. The skull seemed to be that of a male of about 35 years of age. The forehead was low, and the superciliary ridges well developed. Eleven other crania from these graves all belonged to a decidedly long-headed type. The vase contained particles of pounded quartz and flint, and was tolerably well baked. It had a broad, flat, and very thin bottom, and was very unlike any he had ever found with a true British interment in the large barrows on the Yorkshire wolds. It rather resembled a rude kind of dark Romano-British vessel.

The old lighthouse, coloured red, situate on the south side of the turret at the end of the Admiralty Pier, Dover, was removed on Wednesday, and the new lighthouse was brought into use. The latter is situate on the north-western angle of the fort carrying the iron turret at the end of the pier; it is of granite, and is surmounted with a lantern, painted white with a red top. It has been designed by Mr. A. T. Walmisley, M.Inst.C.E., engineer to the Dover Harbour Board. The height of the stone tower of the new lighthouse is 23ft. 3in., and the wind-vane at the top of the lantern is 36ft. 10in. above the glacis of the fort at the end of the pier. The height of the new light will be 55ft. at high-water ordinary spring tides, instead of 44ft., the height of the light discontinued. The light will be a dioptric white fixed light, with flashes at intervals of 7½ seconds. The lantern has been made and fixed by Messrs. Chance Brothers, of Birmingham.



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## THE TRACK BEHIND US.

THE unskilful rower, and sometimes the skilful one, too, knows what it is to watch with surprise the bends and angles of the track his boat leaves behind it. To judge by feeling, his course has been an even one. He has been pulling, as he fancies, steadily and straight. He has had no special reasons for turning to the right or the left, and he was not aware at the time that he did so. Yet there, glistening in the light, lies the record of choppings and changings—no right line, but an odd irregular zigzag. "What made me turn off sharp to the left at that point? Why did I keep on curving to the right afterwards till I nearly ran into the bank? Am I really going any straighter now than I did then?" These are the questions he naturally asks; for the first step towards doing better in future is to find why it was we did badly in the past.

We are all leaving tracks as we go; and the architect's track is amongst the most lasting of them. It lies open to our view for five thousand years or longer—back to the building of the pyramids, or perhaps still further. But never, surely, did it show so many odd twists and turns—such sinuosities and reversals—in the same space as within the lives of men still scarcely more than middle-aged. Its minor changes of direction have been endless. The track, when we only look at short lengths of it, seems a singularly absurd one. Yet, taking it on a larger scale—say for the last half-century—we do begin to see great sweeps and general tendencies in it—proofs that it was partly natural, and not wholly capricious, since it was subject, as all natural things are, to law. Describing it in theological language, we might say that it passed from formalism into faith, and has gone on from faith into agnosticism.

To the average architect of 50 years ago his profession was something to be learned by rote and carried on by custom. He had his Tredgold to supply him with patterns of carpentry; his Peter Nicholson to do the same for joinery and plastering; his Gwilt to keep him in the true path as to masonry and brickwork; his Chambers to watch over him when he essayed to set up a column or a cornice; and his Bartholomew to furnish a model for his stock specification. Good, easy man; what a peaceful time he must have had! He seldom suffered from "the malady of thought." He made his ground-plans, mostly, on a common form, and then, to put it plainly, he cribbed, and cribbed, and cribbed. Perhaps the word is needlessly strong. He bought his books with the single object of copying out of them all he wanted; but the authors who produced them knew it was for that purpose they would be used. Sometimes they offered him volumes of designs, with plans, elevations, and sections all ready to be executed. Then he stole his brooms ready-made, which is even nicer and easier than stealing the hair and the handles separately. All this left him plenty of time to potter about his buildings. Although for strength and soundness they bear no comparison with the best work of to-day, he dithered over them and fussed over them, and was always "on hand." This is what clients like. They seldom know whether building is done ill or well; but they can all see how often their architect visits his works, and how long he stays there. The architect who spends a world of trouble on his designs and details cannot be always hanging about

on the scaffold. He tests what is being done more than he watches it; and though this comes to the same thing, the client does not think so. Thus the wholesale cribber was venerated as a man who looked after his business, and our predecessor of the '30's and '40's grew rich, prosperous, and respectable, till he was buried at last under a box tomb of Portland stone, as ugly and as unreal as if he had designed it himself.

The missionaries arrived when the formalist's son was young. Pugin came forth with his "Contrasts." It was a most offensive book to the father, telling him to adore what he had burned, and to burn what he had adored. It was a book, too from which nothing could be cribbed, which in itself was annoying, and, moreover, it was full of criticisms and caricatures of all that the old gentleman had spent his life in producing. More than this, he had the sense to see that if Pugin's ideas were adopted 5 per cent. would no longer be a paying commission. Value for value, it was obvious that a Gothic building would require at least ten times as many drawings as the regulation Classic one of his period, and when it further appeared that each drawing would need a lot of study the prospect became awful. The formalist foresaw, and foresaw rightly, the end of architecture as a paying profession. If we except a few men of special abilities and special good luck, no architect now makes a fortune at least out of architecture. The surveyor-of-all-work, with his valuations and compensations, his ancient lights, and repairs, and dilapidations, may do so, for he is the lineal descendant of the formalist of 50 years ago, as he shows us plainly enough when he turns his hand to the "common or street pot-boiler." But architecture, as a thing to make a fine living by, is over, as the father told his son it would be if he let himself be led away by Pugin and his denunciations. The warning was useless: the son became a convert, and his zeal, in some cases, outran even that of his teacher.

He began by taking up the later Perpendicular. Converts seldom shake off their heathen ways at once, and for a time he mixed it with the Classic abominations he had renounced. By degrees, however, he grew purer in his aims. He felt the necessity of being orthodox. It grew clear to him that there could be only one true style—one proper period, and that to find this style and period or to miss them would make just the difference to him between artistic life and death. One year he thought the true style was Late Gothic. Another year he thought it was Middle Gothic. Then he perceived it must be Early Gothic. About this time he came upon the "Stones of Venice," and it was borne in upon him with irresistible force that it must be Italian Gothic. A little later, Viollet le Duc and Burges convinced him that it must be French Gothic. But whatever he believed in at the moment he believed in without limit. His style was something which it was men's duty to accept, wholly and unreservedly. It was the only right style to build in, and all others were anathema. Popular writers on architecture encouraged him in these charitable views. Ruskin wrote about the fashions of art as if they were laws of the universe, and his numberless imitators tried to speak more forcibly than he did. With all of them, style was cried up as the main thing. Not what an architect produced, but what style he believed in, was the point that settled whether he was good or bad; and the end of it all was that the power of designing and inventing was almost crushed out by the effort to copy the true models with microscopic accuracy.

If there was one point which everybody agreed on, it was that the most perfect productions of architecture were the only proper ones to imitate. In an arched style, for instance, it was admittedly an imperfection

to use any detail that was not arched; therefore all old houses were imperfect. The orthodox architect had nothing to learn from them. He must take details from churches and cathedrals, and make these up into houses as well as he could. This, for twenty years at least, was what he tried hard to do, and, for hopeless badness, his domestic work of that date stands unrivalled. The world has seen nothing like it. Everything that belonged to the poetry of art was seized to incorporate in the vulgar prose. The window tracery of a chancel did duty as a ready-made clothes' shop, and the canopies of a tomb were stuck over the windows of a City office, as may be seen in Eastcheap. Then Mr. Ruskin suddenly convinced himself and his disciples that the only part of architecture which deserved the name was carving, and the cathedrals of the Continent were ransacked for cornices to deck out gin-palaces and factories.

It was by words that architects had been thrown in this way out of their course. It was by deed that they were brought back, or almost brought back, to it again. A few men of high ability, reared amongst the style worshippers, had eyes to see that good work could be done in all styles. They did not argue about it—they did it. Some took up one unpopular phase, some another, some, like Mr. Norman Shaw, adopted three or four by turns, and showed how charming each could be made. Seeing is believing. We know now, by experience, what dead failures may be produced, and produced wholesale, by adhering to the forms which have been inculcated on us as high moral examples. We know by observation what excellence may be attained in other forms, against which we have been warned in language of unlimited force. The result is that we have become rather sceptical about preferring one type of architecture to another, and are inclined to think that an architect ought to be judged rather by what he does than by what he professes to believe in. This is the mood of the moment. Like previous ones, it has its dangers, though it contains an element of truth. There is no use in trying to force all men into the same shape, or to make them all admire the same types. But individuality has its limits, and though many types may be permissible, we shall find, by prolonged experiment, that some will lend themselves to modern purposes much more easily than others. We may have hereafter more uniformity of style than we are inclined to at present—not because uniformity has been imposed on us by our teachers and governors, but because we have adopted in common those modes of construction and design which turn out in the long run to suit our situation best.

## OLD MASTERS AT THE ROYAL ACADEMY.

THE winter exhibition of works of the Old Masters at Burlington House is as usual, a fine collection, containing in the second gallery a characteristic display of works of deceased French painters in lieu of Dutch pictures, and including examples of Watteau, Corot, and Millet. An appropriate appendage to the works of Old Masters in painting is a beautiful collection of plate illustrating the sculptor-goldsmiths' art. Beginning with English pictures, we have a very choice series of works by Sir Joshua Reynolds, Thomas Gainsborough, G. Romney, J. M. W. Turner, G. Morland, and others. No fewer than 18 Reynoldses and eight Gainsboroughs—some of the finest being lent by the Duke of Westminster—have been hung in the First and the Third Gallery, including the famous picture by Gainsborough of "The Blue Boy" Master Battall, from Grosvenor House, in the latter gallery (129). In the First Gallery, William Etty is repre-



sented by "Venus and Cupid Descending," a beautiful example of graceful drawing and colour, showing Venus and Cupid on a cloud floating downwards. The scarlet drapery gives richness to the colouring. There is true poetical feeling in Sir Joshua's "Children in the Wood" (3), two children asleep under trees, with a robin on the shoulder of one of them, and robbers in the distance. The portraits of "Mrs. Cholmley and Child" (7), "Lady Sondes" (9), a beautiful woman in a large black ribbon-bedecked hat; and the exquisite studies "Felina," said to be a portrait of a niece of Sir Joshua (17), "Cupid as a Linkboy" (20), Cupid holding a torch; "Girl with a Muff" (23), lent by Earl Rosebery; "Boy with Cabbage-Nets" (27), "Countess of Coventry" (30), "The Student" (38), are full of grace in composition and charm of colour—the latter qualities are especially observed in the little girl in a red muff and dress in a landscape (23). From the Earl of Rosebery's collection come two exceedingly beautiful examples of Turner, "Monte Aventino" (8), a view across the Forum at Rome, is a charming study of mist and warm sunlight; and No. 12, "Campo Vaccino," a view of the Tiber from rising ground, exhibited in 1839. The sun and moonlight divide the day and suffuse the atmosphere. Even more beautiful and characteristic of this master of light and atmosphere are his "Pluto and Proserpine," a hilly landscape with castle, the foreground occupied by the Rape of Proserpine (28). The sunlit sky and haze of this picture, and of another from the collection of Mr. G. J. Chapman, "Sun Rising Through Mist" (37), a beach scene, in its opalescent tints and pearl-like hues, are remarkable. Contrasting forcibly with these is the interesting dark painting of "Conway Castle," from Grosvenor House (33). From the Queen's collection, Buckingham Palace, is a fine work by William Mulready, "The Wolf and the Lamb" (22), representing two boys, one bullying the other, under the shade of a large tree. In this example we see the influence on the painter of his study of Dutch masters, admirable in expression, drawing, and sharpness of light and shadow and finished execution. We also notice a true subject by R. P. Bonington, "Sea Shore" (25), admirable in harmony of colour; and a very large and fine canvas, "Rotterdam," by Sir A. W. Calcott, R.A., a view on the river full of shipping, the banks lined with houses, a busy scene, in Calcott's best manner. The calm evening light of the sky reflected on the river, and the clear and luminous painting of craft and landing-stages are characteristic of the painter's work.

In Gallery III., Sir A. W. Calcott's "Morning" is another admirable example of this master, a roadside inn with a group of persons under a large tree. The clearness and decision of touch, and the tranquil, but somewhat monotonous style, and sharpness of foliage are to be noticed. Next to it, in the corner, is Gainsborough's "The Girl at the Stile," a noble example of this painter's landscapes. A dense wood, through which a narrow roadway winds, with a waggon and three horses admirably painted and foreshortened; on a bank a milkmaid talks to the waggoner—the trees are dark and solidly painted. Passing a figure of a boy in grey smock, with a kitten beside him, by William Owen, R.A., and a full-length portrait of Lady Holland, by G. Romney, we come to Lord Tweedmouth's magnificent picture, "The Harvest Waggon," by Gainsborough, one of a pair of notable landscapes. The waggon, drawn by four horses along a road shadowed by trees, is exquisite in drawing and colour, and the movement and animation of the scene. For depth of tone and the study of figures—one of which, a girl getting up on the waggon, is said to be a portrait of one of the painter's daughters—this work is an important contribution. Less of

interest is the fellow one, "Landscape with Cattle and Figures" (96). An interesting incident connected with the former is that Gainsborough painted the harvest waggon with his daughters riding in it, and also in other versions of the same subject. The picture was painted for Wiltshire, the Bath carrier. "The Blue Boy" (129), so well known by etchings, was exhibited in the famous Gainsborough collection at the Grosvenor, and, it is said, was painted to refute Reynolds's opinion about masses of cool colour. The tunic of the boy is a blue Vandyck dress, exquisite for its rich colour and folds. Several admirable portraits, by Reynolds, are to be noticed here. The full-length portrait of the young "Countess of Bellamont," in a lilac dress trimmed with ermine and gold braid, is a slim, but graceful figure. His portraits of "Viscount Malden and Lady Ely Capel" (121) and "Lady Susan Strangeways, Lady Sarah Bunbury, and Charles James Fox" (127), the latter from the collection at Holland House, are notable examples. The ladies in the last are young girls; the latter fell in love with the King, but was afterwards married to Sir Chas. Bunbury, and subsequently ran away with General Napier and married him. But Reynolds's great picture hangs in the centre of long wall, and represents the famous Mrs. Siddons from the Grosvenor collection, lately shown in the "Fair Women" at the Grafton Gallery. The actress is enthroned in the character of the "Tragic Muse" in deep tones of dark brown. Her fine classical features are set off by the tiara she wears, and the long plaits of hair falling over her shoulders, and her knot of pearls on her bosom. Behind her, obscure and dark, scarcely visible, are the faces of "Crime" and "Remorse." It was painted in 1784. Geo. Romney is represented by two full-length portraits, "Lady Holland" (93) and "Mrs. Willett" (123), both good examples. Three splendid specimens of Constable are hung in good positions, in two of which Dedham Church appears. No. 119 belongs to the Royal Academy, and is a lock scene, one of those flat landscapes which Constable was so fond of. No. 124 "Dedham Lock, or the Leaping Horse," also lent by the Academy, shows the river Stour, a large barge filled with persons is being towed by a horse ridden by a boy, and the horse is leaping over a rail on the towing path, the tower of Dedham Church is in the distance; the third picture lent by Sir Samuel Montagu, Bart., M.P., representing "Stratford Mill on the Stour," is also a barge scene. The master's dexterous technique and high lights are conspicuous in these works. The Turners are admirable. One is from the late Sir Julian Goldsmid's collection, "Blue Lights to warn Steamboats off Shoal Waters" (122) a beautiful poem of colour of pearly and iridescent hues. Waves break upon the shore, and vessels are seen in distress through mists of vapour and a stormy sky. Sir John Pender's picture of "Wreckers" (128) is also a fine seascape. Besides these we have a "Virgin and Child," by Van Dyck, lent by the Duke of Westminster (114) a very fine composition rich in colour; the grand centre picture at end of gallery, representing Faith as a maiden seated on clouds holding the Eucharist and two keys before a group of adoring faces (116) is attributed to Murillo, and are lent by Mr. Alex. Henderson. There are also lent by the Queen two Titians—a wooded landscape (106), and portraits of the painter and Franceschini, Grand Chancellor of Venice. The sketch for the celebrated picture in the Doge's Palace, said to be the largest in existence, 84ft. long and 34ft. high, "Il Paradiso" (105), by Tintoretto, is a fine composition, crowded with figures of saints. Another reputed Tintoretto is lent by Mr. Ruskin, "The Doge in Prayer" (103); and the example of Claude, "The Sermon on the Mount"

(104), a large picture lent by the Duke of Westminster, is worth notice, also the same donor's "Worship of the Golden Calf" (109).

The French pictures in the second gallery comprise a large moonlight scene by Charles François Daubigny, a wonderful piece of sky-painting, masses of detached clouds illumined by the moon. The examples of Paul Delaroche from Lady Wallace's collection (47 and 49)—especially "Cardinal Richelieu on the Rhine bringing back Cinq-Mars" (47), where the celebrated cardinal is seen in a barge propped up on pillows surrounded by courtiers—are interesting. This painter's view of "St. Paul's from the Surrey side" is truthful in drawing and colour. The two very beautiful works of Corot, "Evening" (63), "Landscape" (70), are delightfully painted. The serene evening light in the first seen through trees and the silhouetted figures dancing against the sky, is full of delightful sentiment and delicacy of tone. A very beautiful study of a little girl by Jules Bastien-Lepage—a half-figure study—is admirable in colour and tone. The Queen sends a Gaspar Poussin "Landscape" (52), a dark, sombre canvas, and the work by Jean François Millet, "Wood-Sawyers" (64), is splendid in its movement of the two men sawing a log, and refined in colour. Meissonier is represented in Lady Wallace's contributions. "Bravi" (72), a small interior, two assassins standing and waiting behind a door, and "L'Amateur d'Estampes" (75). The noted mistress of Louis XV., "Madame de Pompadour," by François Boucher (79), is a fine portrait of the lady in a rich blue dress. Dulwich College sends two Watteaus, "A Ball Under a Colonnade," full of life and graceful motion (78), and "Repast in the Wood," a group of ladies and gentlemen.

Gallery IV. has several "Old Masters" of various schools, or reputed as such. Correggio's "Christ Taking Leave of His Mother" (131) is brilliant in colour and chiaroscuro. Other works of the Italian school are "St. Cecilia," lent by Mr. Chas. L. Eastlake (133); "Death of the Virgin" (144); "Cupid and Psyche," by Filippino Lippi (150); "The Trinity and Virgin Enthroned" (151), a very fine example of the Early Florentine school and "Coronation of the Virgin" (148), both lent by Mr. R. H. Benson; "Death of the Virgin," Umbrian school (144); "Virgin and Child Surrounded by Saints" (145), painted on gold grounds; "St. John the Baptist," by Giovanni di Paolo (146); a circular picture of the Virgin enthroned, by Lippo di Dalmazio (149); a diptych (155), representing the Crucifixion on one side and a Pietà on the other; a rich Giorgione "Temperance"; a Hans Holbein "Portrait of Sir Thos. More" (138); "St. Jerome" (163); and other German and Flemish works. Some of these are of doubtful authenticity.

In the Water-Colour Room, the collection of English plate, brought together under Mr. Alfred Gilbert's direction, is very interesting to the student of the sculptor-goldsmith's art. The London companies, the Colleges of Oxford and Cambridge, Corporation of London, and private collections have contributed to the exhibition. Ten cases of plate are on view. Case A contains several very beautiful examples of ecclesiastical work, a German 15th-century silver-gilt chalice, also three very elaborate silver chased and repoussé processional crosses, croziers, a beautiful reliquary of rock crystal in copper-gilt in the form of a sepulchral monument. The City Companies, especially the Carpenters, send example of cups and covers of silver-gilt repoussé dated 1628 and 1611, in case B. The Merchant Taylors, the Skinners, the Drapers, Vintners, Mercers, and other Companies show tankards, flagons, cups, saltcellars, loving-cups. Case D has a very characteristic collection, including a 16th-century cover, silver-gilt and octagonal body; also a silver-gilt dish, 1545, lent by Christ's College and Corpus Christi College,



Cambridge. The silver flagon, with bow handles, dated 1676, belonging to Fishmongers' Company, and the stoneware jug, with silver parcel-gilt mountings, and the punchbowl of repoussé of the Corporation, in case E, are of much interest. The Bishop of Durham sends a flagon and a set of Communion vessels, presented to Auckland Palace Chapel by Bishop Cosin, 1660, and the Dean and Chapter a silver-gilt repoussé ciborium and cover, also a gift of Bishop Cosin to Durham Cathedral. The great iron repoussé shield, lent by the Queen, called the "Cellini shield," stands on a pedestal and is of Milanese workmanship; it is said to have been presented by Francis I. to Henry VIII. at the Field of the Cloth of Gold in 1520. Cellini had probably nothing to do with it. To the student of plate and design, the collection has unique value in addition to the great historic interest of the articles themselves, which have never been before publicly exhibited as a series.

## DESIGNING OF STEEL BRIDGES, THEORETICAL AND PRACTICAL. —XXV.

AS the phrases, "single system of triangulation," "a single or one series of triangles," are constantly employed in treating of the web of open-web girders and trusses, it becomes necessary to accurately define the meaning of them. It is also equally important to be able to ascertain by simple inspection whether the vertical or diagonal bars in an open-web girder constitute a single, double, treble, or multiple system of triangulation or series of triangles. Let Fig. 1

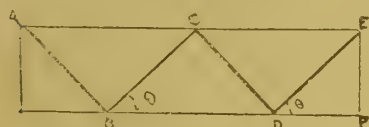


FIG. 1.

represent a small open-web girder, in which there is but one system of triangulation formed by the diagonal bars A B C D E. This particular description of girder will probably be familiar to our readers as that of the old Warren pattern, in which the inclined bars were originally all of cast iron, irrespectively of the fact whether they were under a compressive or a tensile stress. Under these conditions, and constructed of that material, their career was a short one. Several accidents occurred, attended with loss of life, and the Warren girder was abandoned as originally designed and built. The form, however, was, and is still, maintained, and substituting wrought iron and steel for the more brittle and less reliable material, it has done good service alike to the architect, the engineer, and the builder. It is obvious that in Fig. 1 there are no intersections of bars or crossings in the web, so we may now pass on to a consideration of the next figure. Here, while retaining Fig. 2, the original series, or primary series of triangles as it is sometimes termed—that is, the bars A B, B C, C D, D E in Fig. 1, we introduce a second series F G, G H, H K, K L, intersecting the primary series at the centre of the girder. In

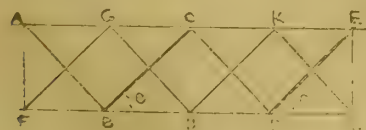


FIG. 2.

other words, the crossings or points of intersection divide the bars in half. If the angle  $\theta$ , which is the angle of inclination of the diagonal bars to the flanges of the girder—that is, to the horizontal, be made equal to  $45^\circ$ , which is a very usual value for it, then the diamonds formed by the half-bars will be all squares. As the value of the angle becomes smaller, the bars become longer, supposing the depth to remain constant. This is not of so much importance when the bars are exposed only to a tensile stress; but it becomes of

very great importance when they are subjected to one of compression. Half of the diagonal bars of the web are always subject to stresses of a compressive character, and at certain times, and under certain conditions, they may all undergo "reversals" of stress—an expression the meaning of which was fully explained in our last article. If, on the other hand, the depth of the girder be varied, and the angle  $\theta$  maintained at a constant value, the length of the bar will be altered correspondingly.

In Fig. 1 let EF equal D, the depth of the girder, and L the length of the bar DE; then we shall always have—

$$D = L \times \sin \theta$$

or, since the sine of any angle is the reciprocal of its cosecant, the equation may be written—

$$L = D \times \text{cosec. } \theta.$$

The limits for values of L are evidently when  $\theta$  equals zero and when it equals  $90^\circ$ . In the former case the length of the bar becomes infinite—that is, it becomes merged into the horizontal flange, and coincides with it in direction. When  $\theta$  equals  $90^\circ$ , the diagonal bar becomes vertical, and its length is reduced to a minimum. It will be subsequently pointed out that in large and deep open-web girders vertical bars have an especial value, and it is very usual to employ them as struts in all such structures, particularly in American bridges. When the angle  $\theta$  has, as in Figs. 1 and 2, the particular value of  $45^\circ$ , the length of the bar may be obtained in terms of the depth only. In the right-angled triangle EFD in Fig. 1 we have, substituting L and D as before in the equation—

$$L^2 = 2D^2,$$

from which—

$$L = \sqrt{2} \times D = 1.4142 \times D.$$

The respective lengths of L and D must be measured from the same starting point, all thicknesses of horizontal plates in the flanges, both upper and lower, being omitted. Too much precision need not be aimed at, for, unless the number of horizontal plates piled up to build the flanges are very numerous, the difference in the length of the bars will be but a very few inches. Moreover, in taking out quantities of ironwork, as well as of any other materials, or of any description of constructive work, full lengths are—or, at least, ought to be—allowed for. If a bar or plate of iron or steel is cut off on the bevel, as all diagonal bars of open-web girders must be, the length must be measured to a point where the prolongation of one of the longitudinal edges meets a perpendicular let fall upon it from the other edge. When the diagonal bars make an angle of  $45^\circ$  with the flanges of the girder, this



FIG. 3.

additional length will be found to be equal to the width of the bar. This follows from the fact that all bars, plates, and other sections of iron and steel are cut square at the ends after rolling.

In Fig. 3 three systems or series of triangles are introduced, and, comparing it with Fig. 2, it will be seen that there is an intimate relation between the number of intersections or crossings of the diagonal bars of the web and the number of the systems of triangulation. Put T for the number of series of triangles and N for the number of intersections of the bars at the open web, then—

$$T = (N + 1)$$

If we call the primary series A, B, C, D, E in Fig. 3 unity, and commence counting from it, the consecutive number of apices situated between it and the next apex of its own system, we at once obtain the number of systems of triangulation. There are a few points in connection with these separate systems which are deserving of notice. In the first place, the diagonal bars are all supposed to meet or nearly meet within the depth of the flanges. Secondly, although the bars are generally riveted, or sometimes bolted to each other at their crossings, they are not assumed to transfer any of the load each has to carry to any

other system but their own. For example, in Fig. 2, a weight at the apex H would not—or, at any rate, is assumed not to—affect any other bars but those belonging to its own system—that is, the bars F G, G H, H K, and K L. Whether this assumption be strictly accurate or not, it is absolutely necessary to make it; for, if any portion of the stresses upon the bar of any one particular system of triangles was supposed to be transmitted to the bars of the other systems, the process of calculation would become so complicated as to be utterly impracticable, especially

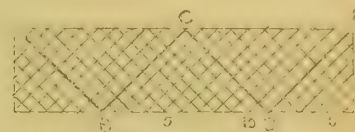


FIG. 4.

where the number of separate systems was large. While the actual number of the systems of triangulation than can be introduced in the web of any girder or truss is unquestionably very large, there is nevertheless a limit to it. It is obvious that as the number of separate series of triangles becomes increased, the smaller becomes the size of the open diamonds or spaces between the bars, and it is quite possible to continue increasing the former, and diminishing correspondingly the size of the latter, until the open spaces disappear altogether. The diagonal bars will then be in contact, and the girder virtually converted into one belonging to the solid-sided or plate type. The girder with the maximum number of separate systems of triangles which has come under our observation is represented in the skeleton elevation in Fig. 4. It has 10 series of triangles, and was erected by the London and North-Western Railway Company to carry their line over Prescot-street. The girder has a span of 118 ft., a depth of 17 ft., and vertical bars spaced 6 ft. apart from centre to centre. These bars are not shown in the elevation in Fig. 4 to avoid confusing the diagram, as the width of the diamonds measures only 2 ft. This example belongs to the lattice or trellis type of girder, originally constructed of timber in a few American bridges, under the designation of Towne's trellis bridges. One of these wooden structures, consisting of 13 spans, was built over a river on the Susquehanna Railway, and fulfilled its duty remarkably well for several years.

Although the lattice or trellis girder is not to be recommended for large spans, and has, to a great extent, been superseded by others of a far more open-web description, yet the example in Fig. 4 is both interesting and instructing. Comparing it with its prototype in Fig. 1, it will be seen, while retaining the general principles belonging to that particular type of girder, how wide was the scope allowed to the designer for modification in the actual building up of the design. The open-web girder as constructed at present has rarely more than two, or at the most three, systems of triangles. It will be observed from an inspection of Figs. 2 and 3 that the greater the number of the series of triangles, the greater are the number of apices or points of connection between the open-web and the upper and lower flanges. Consequently, the more uniformly are the individual loads, supposed to be concentrated at either the upper or lower apices, or sometimes on both, distributed over the flanges. This is undoubtedly the case, and it is clear, so far as this sole condition is taken into consideration, that the old Warren girder, shown in Fig. 1, erred as much with respect to the number of bars in the web, in the matter of deficiency, as the trellis girder shown in Fig. 4 does on the side of redundancy. The true aureum medium may be thus fairly assumed by the adoption of an open web resembling the examples shown in Figs. 2 and 3. It has been already stated that it is optional, under certain conditions, for the engineer to determine whether the diagonal bars in the web of a girder are to act as ties or struts. The position of the load to a great extent determines this point, although it leaves a limited discretion. In Fig. 5, having regard only to the primary series of triangles represented by the diagonal bars A B, B C, C D, D E, let the load be placed on the upper flange, and let it be put equal to W. Its distribution will be as follows:—At the apex C we shall have, calling L the share of the total load W supported at that point, and L<sub>1</sub> the



share carried by the abutments or *points d'appui* at F and G—

$$L = \frac{W}{2} \text{ and } L_1 = \frac{W}{4},$$

and always—

$$L + L_1 = \frac{W}{2} + \frac{2W}{4} = W.$$

The share of the total load  $W$  carried by each abutment exercises no stress upon either the upper or lower flange, or upon any of the diagonal bars of the web. In other words,  $L_1$  must in each case be supported in the first instance by the terminal vertical pillars A F, E G, which finally transmit the load  $\frac{W}{4}$  to the abutments. We have,

therefore, only to consider the action of the load  $\frac{W}{2}$  situated at the apex C. From what has been

already stated, this will be transferred in equal portions to the abutments F and L, causing stresses of compression on the bars C B, C D, stresses of tension on the bars B A, D E, and again stresses of compression on the vertical bars A F and E L. With the load on the upper flange under the conditions assumed, which are those of numerous bridge girders in actual use, there is no other possible arrangement of the character or amount of the resulting stresses.

Instead of the load being uniformly distributed over the upper flange, let it be supposed to be similarly distributed over the lower flange or "boom," as it is frequently termed. Employing the same notation as before, the individual location of each separate portion or share of the total load  $W$  will be very different. Putting  $L$  equal to the portion of the total load supported at the points B and D and  $L_1$ , as before, equal to the share carried by each abutment, the arrangement is the following:—

$$L = \frac{W}{3}, L_1 = \frac{W}{6}.$$

But as, independently of the particular manner in which the portions of the total load may be separately located, the sum of them must be equal to the total load, we have, therefore—

$$L + L_1 = \frac{2W}{3} + \frac{2W}{6} = W.$$

Under this different position of the load the character, as well as the amount of the resulting stresses upon the diagonal bars, will vary correspondingly. The portion of the total load  $W$ , placed at B, will bring tensile stresses upon the diagonal bars A B and B C, a compressive stress upon the bar C D, a tensile stress upon the bar



Fig. 5.

DE, and compressive stresses upon the vertical bars A F and E G. It is necessary also to trace the action of that part of the total load situated at the point D, not only to indicate how the total stresses upon each bar are arrived at, but for another reason which will be subsequently explained. The portion of the total weight at the point D will place the bars D C and D E in tension, the bar B C in compression, the bar A B in tension, and the vertical bars A F and E G in compression. It is evident that the total stresses upon the bars A B and D E will be equal to the sum of the stresses to which they are subjected from both portions of the total weight placed at the points B and D. The important point to be kept in view with respect to this particular distribution of the load is, that the two central bars B C and C D are completely free from stress of either character—tension or compression. This statement requires some explanation, as it frequently embarrasses those studying the subject for the first time.

In the first place, it must be borne in mind that since the portions of the total weight at the points B and D are situated at equal distances from the centre of the girder, the stresses transmitted by the central bars B C and C D to each abutment respectively are equal, and consequently the stresses induced upon the bars B C and C D themselves are equal, but they are of opposite character. It has been shown that the share of the total weight at B brings a tensile stress upon

the bar B C and an equal compressive stress upon the bar C D, and the portion of the weight at D brings a tensile stress upon C D and an equal compressive stress upon the bar B C. These four stresses, for the reason already given, are all equal to one another; but two of them are stresses of one character and two of another. It is an axiom in the designing of girders, that no member can undergo stresses of both tension and compression at one and the same time. If we put the sign plus to represent a stress of compression and the sign minus for one of tension,  $S$  for the stresses upon the central bars B C and C D, and  $S_1$  for the total or resulting stress upon either of them, we have the equation—

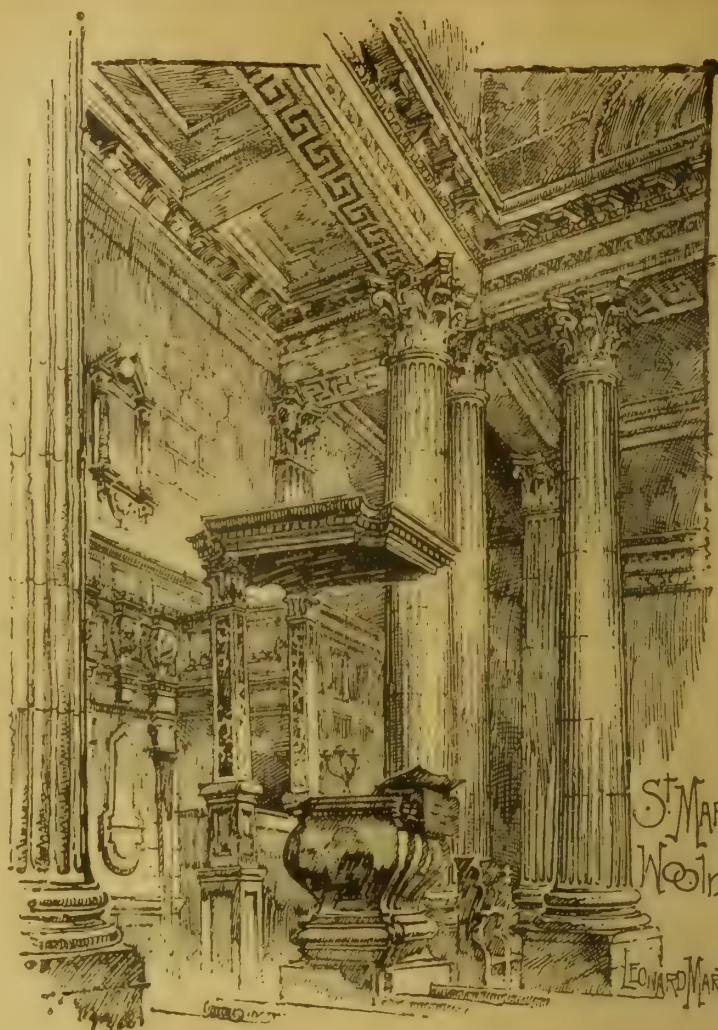
$$S_1 = (S - S) = 0.$$

The effect of introducing vertical bars or "uprights" and additional diagonal bars, as shown by the dotted lines in Fig. 5, will be fully investigated in our next article.

#### LONDON CITY CHURCHES.\*

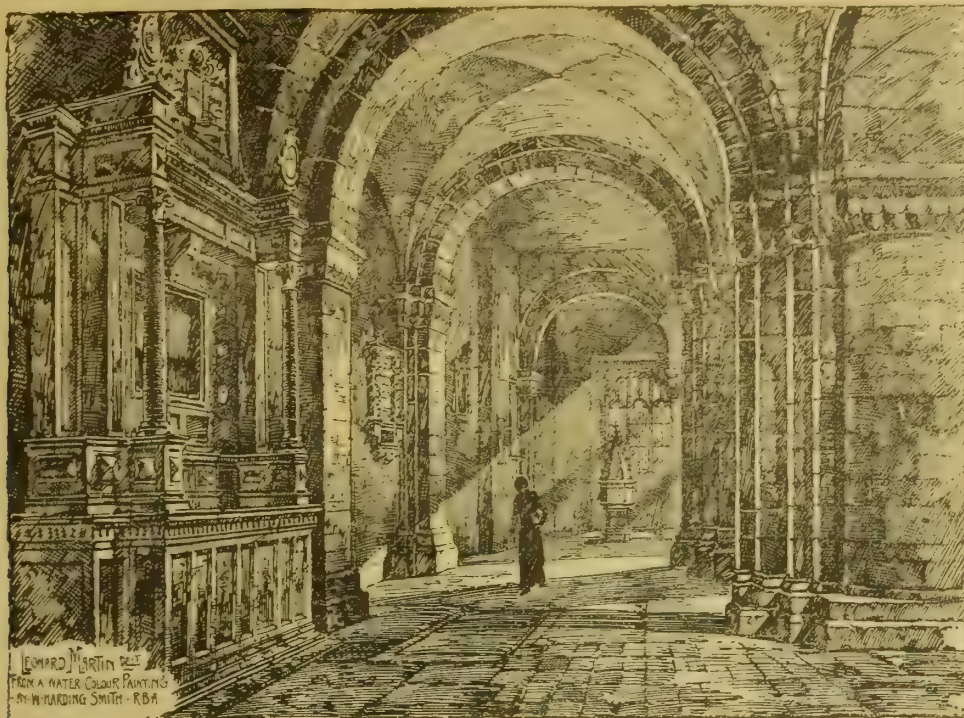
A VOLUME of convenient size, written with knowledge and care, and well illustrated, descriptive of our ancient City churches, has been long wanted. There is ample material for such a work. Mr. A. E. Daniell's little volume under the above title, which is illustrated by numerous photo-process and other vignette blocks, supplies in some degree this want. The author has brought together, in a small compass of 357 pages, a readable account of each of those sacred edifices. The materials at command have been handled with discretion, and in a popular style. For the ecclesiologist and architectural reader, a little more accuracy and detail might have been wished, and in some cases the interior views have not been taken from the best point of sight; notwithstanding which, we must be thankful that an author has been found who has dealt with the subject in a comprehensive spirit,

\* London City Churches. By A. E. DANIELL. With numerous illustrations by LEONARD MARTIN. Westminster: Archibald Constable and Co.



and with an evident zeal and love. In the introduction, Mr. Daniell refers to the absence of a chancel arch in these City churches—a fact which, he says, gave rise to the idea that Wren built his churches without chancels. Of course, such an idea is quite wrong. Wren, no doubt owing to the smallness of these buildings, found that it was wiser to dispense with the arch, and to mark the separation of nave and chancel by a screen, as, the author observes, was followed in All Hallows, Thames-street; St. Peter's, Cornhill; St. Olave's, Hart-street, and other churches. Beyond this, Wren worked independently of all Medieval restraint; his plans were based on Italian models. We are told that no fewer than 86 parish churches were destroyed or damaged by the Fire of 1666, and it was impossible to rebuild all these. Thirty-five of them were not rebuilt; Wren, however, rebuilt 49 of those that had been destroyed. In the useful list of churches given, we find that the following are anterior to the Fire:—All Hallows Barking; St. Andrew Undershaft; St. Bartholomew the Great; St. Eihelburga, Bishopsgate-street; St. Giles', Cripplegate; St. Helen's, Bishopsgate; St. Catherine Cree, St. Olave, Hart-street. Of Wren's churches that have been destroyed the following are given:—All Hallows, Bread-street; All Hallows the Great, Upper Thames-street; St. Antholin, Watling-street; St. Bartholomew by the Exchange; St. Benet Fink, St. Benet Gracechurch, St. Christopher-le-Stocks, St. Dionis Backchurch, St. Mary Magdalene, Old Fish-street; St. Mary Somerset, St. Matthew, Friday-street; St. Michael, Crooked-lane; St. Michael, Queenhithe; St. Mildred, Poultry; and St. Olave, Jewry; in all 15. Mr. Daniell's book begins with churches anterior to the Fire, and which are described in the order we give above. All Hallows Barking, so well known to all lovers of the ancient City churches, at the junction of Tower-street and Seething-lane, and near Mark-lane Station, belonged to the Convent of Barking, in Essex, a religious establishment of great antiquity, founded in the 7th century, it is believed. Many English sovereigns bestowed special marks of favour on the church.





SOUTH TRANSEPT, ST. BARTHOLOMEW THE GREAT.

It has nave, chancel, and two aisles, and the author alludes to the recent restoration of the north aisle and porch, with chamber above, open-timber roof of north aisle. Interiorly the style is of Perpendicular or 15th-century character. A good photo. interior view by the London Stereoscopic Company is given. The west end has Norman pillars. William Penn, the founder of Pennsylvania, was baptised at All Hallows in 1644, amongst other interesting facts recorded. Two altar-tombs of the 15th century, and many monuments and brasses, are to be seen in this very interesting old church. St. Andrew Undershaft, Leadenhall-street, so named from a custom of erecting a maypole or shaft taller than the steeple in front of the south door, is of Late Perpendicular style, with tower rebuilt in 1830. It has been several times restored, but the carved oak pulpit and some pews remain. The church is interesting by reason of its containing a terracotta monument to the great antiquary, John Stow, at the eastern end of north wall. The illustrious archaeologist is shown seated at a table, with a book before him, holding a pen. The Latin inscription is given, also an account of the merciless and ungrateful treatment he received when age and infirmity had overtaken him, and he petitioned James I. for a license to collect alms for himself, which was granted; but very little response was given to his appeals—another example 'of unrewarded genius and labour. Stow's "Survey of the Cities of London and Westminster" and his "Chronicles of England" have long been valued by students.

The noble church of St. Bartholomew the Great, West Smithfield, the oldest parochial church, is concisely dealt with, and we are permitted by the publishers to reproduce the ink drawing of south transept, by Mr. Leonard Martin, from a water-colour painting, by Mr. Harding Smith, R.B.A. It is needless to say the fine Norman and Transitional work of Rahere, the founder and first prior, still remains the most characteristic part of this noble church of the Priory of St. Bartholomew, at least the choir and transept. The Early English nave was destroyed at the time of the Dissolution of monasteries, and gave place to one in the Perpendicular style. The compiler describes the late work of restoration carried out from the designs of Mr. Aston Webb, who restored the new apse to its original design, and designed the flat oak ceiling of tower and the restored south transept. The restored church was rededicated in 1893, after a lengthened period of restoration began in 1864. The chief monuments are described, beginning with that of the great founder, Rahere, which is surmounted by a recumbent effigy under a rich groined canopy, in the north side near the altar. Sir Walter Mildmay, one of Elizabeth's statesmen, has a monument in the south aisle. It is said the font is the very one in

which Hogarth, the painter, and his sisters were baptised.

The interesting Perpendicular church of St. Giles, Cripplegate, is illustrated by an interior photo. block; a photographic interior of the fine Church of St. Helen's, Bishopsgate, with a detailed account of its restorations and monuments is also given. The church has the peculiar plan of a double nave, the north called the nun's nave, and the other the parochial nave, also a south transept with two eastern chapels. A brief account, illustrated by a view of the interior, is given of the noted Church of St. Catherine Cree, Leadenhall-street, said to be designed by Inigo Jones. Its arcade of circular arches panelled in the soffits, resting on Corinthian capitals, and its flat grooved ceiling are incompatible features; but its chief interest lies in the fact of its consecration by Laud, whose elaborate ritual observances drew down upon him "the sarcasm of Prynne." St. Olave, Hart-street, is a beautiful church of the Perpendicular period, restored by Sir Gilbert Scott. We give an illustration by Leonard Martin, of St. Mary Woolnoth, designed by Hawksmoor—square in plan, with twelve Corinthian columns in groups of three at the angles, one of which groups our view shows with the prolongation of the entablature—a handsome arrangement. Every visitor to Lombard-street knows its exterior, with bracketed clock. It has a fine altar-piece and pulpit of oak, besides a finely-cased organ. Space precludes notice of the other churches described, many of them of much historic and antiquarian interest. Mr. Daniell's book is a concisely-written handbook of their features and memorials.

#### THE SCULPTURES IN THE LADY-CHAPEL, ELY.\*

LORD ALWYNE COMPTON, Bishop of Ely, has been solely responsible for the general idea of the admirable folio collection of photographs of the sculptures in this remarkable building illustrating the Scriptural and legendary history of the Virgin Mary. These photographs are accompanied by an entertaining and learned paper, with descriptions and identifications, by Dr. Montague Rhodes James, Director of the Fitzwilliam Museum, Cambridge, whose account of these carvings was originally read before the Cambridge Meeting of the Archaeological Institute in 1892. The endeavour of the author is restricted to an attempt to throw some fresh light upon the iconography of the building, and more particularly upon the figured representations which occur in

the wonderfully rich and beautiful arcade which elaborates its walls on all sides. Each compartment consists of a niche and two spandrels, and in each spandrel is a group of figures illustrating incidents more or less associated with the life and miracles of the Virgin, which filled some of the earliest Apocryphal Gospels, such as the "Book of James," written in Greek, probably before the end of the first century, and in this work the Virgin's parents' names, Joachim and Anne, were first given. Dr. James has several exceedingly pertinent and learned remarks in his essay on these pious tales and stories of deliverances associated with the worship of the Mother of Christ. He is, however, unable to determine which collection of miracles the sculptor of the Ely Lady-Chapel carvings used as his authority; but Dr. James has come upon one collection which seems to have particular affinities with Eastern England. It is preserved in the British Museum MS. (Royal 5 A VIII. Cat. of Romances, British Museum II., 650), which belonged to Bury Abbey, and contains a miracle which happened in the diocese of Ely, and perhaps four miracles which occur in these sculptures. Each example illustrated is described in the order in which the panels proceed round the chapel, and the more notable may be here briefly referred to. Thus, in No. 3, S. side, Archbishop Syagrius, of Toledo, is doing penance for wearing a chasuble given by the Virgin to his predecessor, St. Hildephonsus. Nos. 4, 5, and 6, illustrate the history of Theophilus, who, through the influence of a Jewish wizard, sold his soul to the devil, and he is shown here in various predicaments. No. 7 shows an unmentionable incident; but the mutilated state of the figures renders the unedifying story innocuous. No. 8 shows St. Hippolytus, assisted by the Virgin, giving a man afflicted with the *mal des ardents* a new leg. No. 9, St. Mary and the usurer's vision. No. 10, the rejected offering of Joachim. No. 11 shows Judith taunting her mistress, St. Anne, with barrenness. The headless condition of the maid, however, now minimises the sting of her taunt. No. 12, Joachim and Anne at the temple gate. No. 13, the birth of the Virgin. No. 14, one of the most handsome of the series, representing the Virgin brought up in the temple. No. 15, the marriage of Joseph and Mary. The Annunciation and Visitation come next. No. 17, the administration of the water of jealousy to Mary and Joseph. No. 18, the journey into Bethlehem. No. 19, the Nativity. In the lower stall the Magi on their journey are shown. At the west end, in No. 1, Herod is giving orders for the massacre, and in the next two the scene of the murder of the children is possibly intended to be represented. The next four groups are not clearly defined, and others of secondary importance follow. On the north side, the Virgin's coffin,

\* The Sculptures in the Lady-Chapel at Ely. By MONTAGUE RHODES JAMES, Litt. D., Fellow and Dean of King's College, Cambridge. London: D. Nutt, 270, Strand, W.C. Price 15s.



borne by four Apostles, occurs, very much broken, however. No. 4 represents the Assumption—angels supporting the Virgin in a *mandorla*. The crowned Virgin figures in several pictures, but all the faces were chopped away by the Puritans; remains exist, however, in places of the original colour decoration. In No. 13 is Pope Ciesarius or Leo, who was tempted by Satan in the guise of a woman when he was saying Mass: by way of penance he cut off his hand, and it was accordingly restored by the Virgin. Another represents the Virgin rescuing a Jewish boy from an oven into which his father had cast him for receiving the Eucharist at Bourges. The more the details of Mediaeval and early sacred art are studied, the more frequently, of course, is the full intent of the artist realised; but, nevertheless, without the aid of authorities, either monumental or written, the study is almost a hopeless one. Dr. James mentions several such authorities, and in an appendix he gives a short conspectus of three series of illustrations of the Virgin's miracles, the one being, as before described, at Ely, the others are two fresco series existing at Eton and at Winchester Lady Chapel. Several additional plates enhance the volume, which is capably produced, doing credit to the author, and, of course, to the editor, the Bishop of Ely, but most of all in this respect to Mr. David Nutt, the well-known publisher in the Strand. As a practical work to the architect and sculptor the book needs no recommendation, and as a volume for the drawing-room table to the lover of art for its own sake none better could well be named.

#### GRAPHICAL DETERMINATION OF THE STRESSES IN THE MEMBERS OF A COLLAR-BEAM ROOF-TRUSS.—II.

BEFORE proceeding to the cases of this problem where the given forces are not applied symmetrically, it may be well to consider separately the problem of determining the two supporting resistances,  $R_1$ ,  $R_2$ , called into

corresponding end of the structure as unfixed, and resting on rollers.

What we have to bear in mind in all cases is that the two resistances  $R_1$ ,  $R_2$ , must equilibrate the whole of the given external forces. But for the given forces we may substitute their resultant,  $R$ , and then we have to find  $R_1$ ,  $R_2$ , so that, acting at A respectively, they may balance the resultant  $R$ . In other words, the whole structure will be in equilibrium under the action of the three forces  $R$ ,  $R_1$ ,  $R_2$ .

Now it is known that, for anything to be in equilibrium under the action of three forces, the lines of action of the three forces must either meet at a point or be all parallel.

Suppose  $af$ , Fig. 3A, to represent the resultant of any given system of forces acting on a structure which is supported at the points A E, and let V W, Fig. 3, be the line of action of that resultant. Let A A be given as the line of action of one of the required resistances. In order to completely determine the two resistances from these data, we have two obvious courses open to us.

(1) Draw (Fig. 3) a line E E through E to pass through the point in which A A, V W will meet. Then E R is the line of action of the other resistance, since the lines of action of the three forces must meet at a point. Therefore, Fig. 3A,  $fh$  being drawn parallel to E E, and  $ha$  to A A, will determine the two resistances, for these represent the forces which, acting along E E and A A respectively, balance the force  $af$  acting along V W. If A A, Fig. 4, be given parallel to V W, then the two resistances will be parallel to each other and to V W. The method just given fails in this case; but the resistances may be found from the fact that they must be parallel forces acting at A and E, whose resultant acts along V W, and is equal to  $fa$ . This tells us that V is the "centre" of these parallel forces, which must therefore be inversely proportional to the distances A V, V E. The construction for this case is shown in Figs. 4-4 a, where  $a E'$  is drawn at any angle to  $af$ , and on it are set off the lengths  $a V'$ ,

meet A A at X. Join X E, and draw in Fig. 5A  $Oh$  parallel to E X, to meet  $ah$  parallel to A A. Join  $ha$ . Then  $fh$  represents the resistance at E, and  $ha$  that at A. The line E E, drawn through E parallel to  $fh$ , is evidently the line of action of the resistance at E. If A A be given parallel to V W, the construction just given will determine the resistances. In such a case  $h$  will fall on  $fa$ . The reader can easily supply the figures for this case. J. C. PALMER.

#### CONCERT HALLS AND ASSEMBLY ROOMS.—VIII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

MANY buildings of this class, as I have said, although public buildings, follow the lines of clubhouses in their internal arrangements, more especially where a casino is situated at some pleasure resort or watering-place. This particular kind of casino, besides containing a large ball-room, has generally a suite of reading and refreshment rooms, and the great art in the planning seems to be to adapt the building for the purposes of a large or small numbers of visitors, with the possibility of using it for all manner of entertainments. Such buildings exist, to some extent on similar lines, at our own fashionable watering-places, as at the Spa, Scarborough, and to a smaller extent the Pavilion, at Whitby. The casino of the watering-places of the Continent combine the advantages of a social club, a common dining-room, a restaurant, library, reading-room,



FIG. 1.—A, reception-room; B, refreshment-room; C, billiard-room; D, buffet; E, reading-room; F, gentlemen's lavatories; T, terrace.

and a hall suitably constructed for a concert-hall and a theatre. In wet weather the hall becomes the morning promenade or the children's play-room, and a small entrance-fee makes it a paying concern.

There seems to be a regular system in laying-out a Continental watering-place on German

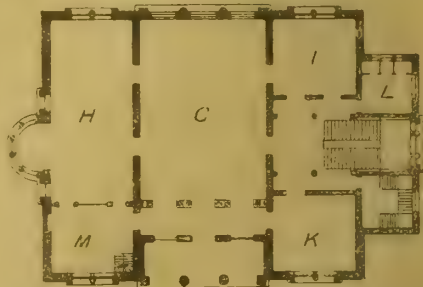
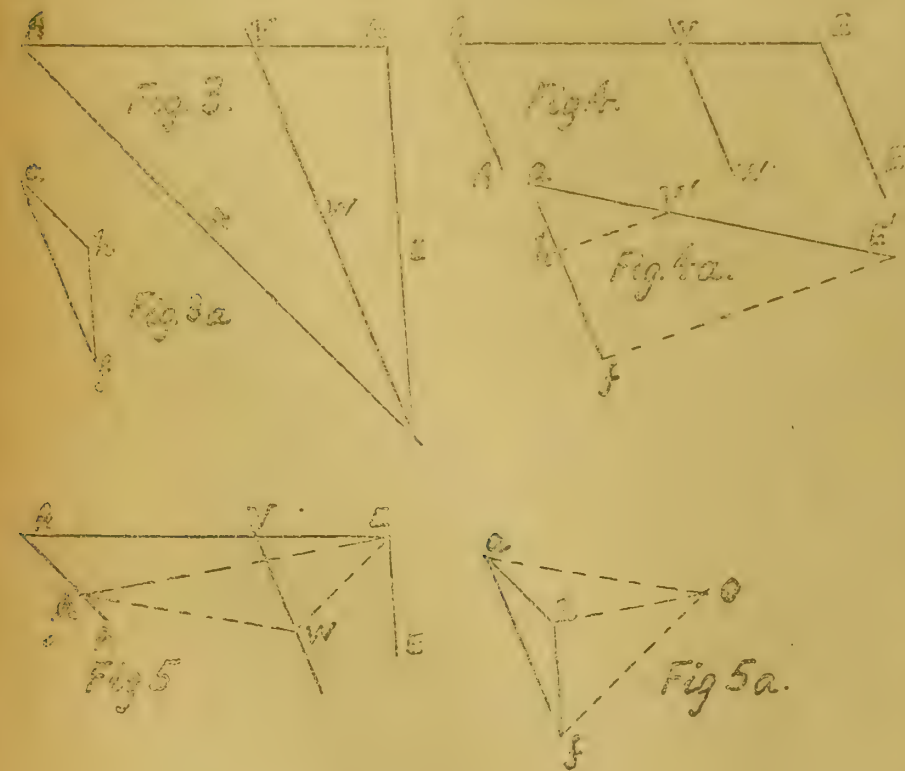


FIG. 2.—G, dancing hall; H, supper-room; I, ladies' saloon; K, drawing-room; L, ladies' cloakroom; M, buffet.



action in the case of a structure which is supported at the two points, A E, and which is acted upon by a given system of external forces. It should be observed in any such case that the resistances are really indeterminate. Something must, in general, be assumed concerning them, as, for instance, that they are parallel, or that one of them is vertical. If we wish to find the least resistances which can possibly support the structure, the resistances must be taken as being parallel, for thus we shall have their sum a minimum. Assuming that one of the supporting resistances is vertical is equivalent to taking the

V' E', equal to E V, V A respectively, and V' h is drawn parallel to E' f. Hence  $fh$  represents the resistance at E, and  $ha$  that at A.

(2) Instead of the construction given in (1) we may make use of a funicular polygon.\* Thus, Fig. 5A, take any pole, O, and draw O a, O f; then, starting from E, Fig. 5 (a point in the unknown line of action), draw E W parallel to O f, to meet V W at W, and W X parallel to O a to

\* Gray and Lawson's "Graphical Statics" explains very clearly and fully the uses of the funicular polygon. Published by W. Collins, Sons, and Co. 3s. 6d.

lines, with an esplanade on the sea front, an hotel quarter, hot baths, bazaars, music-pavilions, cafés, &c.

In the magnificent dancing establishment of Saarbrück, we find (Fig. 1) on the ground-floor plan that the approach is made to the entrance by two flights of broad steps, flanked on either side by a wide terrace. The entrance-lobby has three doorways, and an inner lobby leads to the hall, to the right of which is the grand staircase



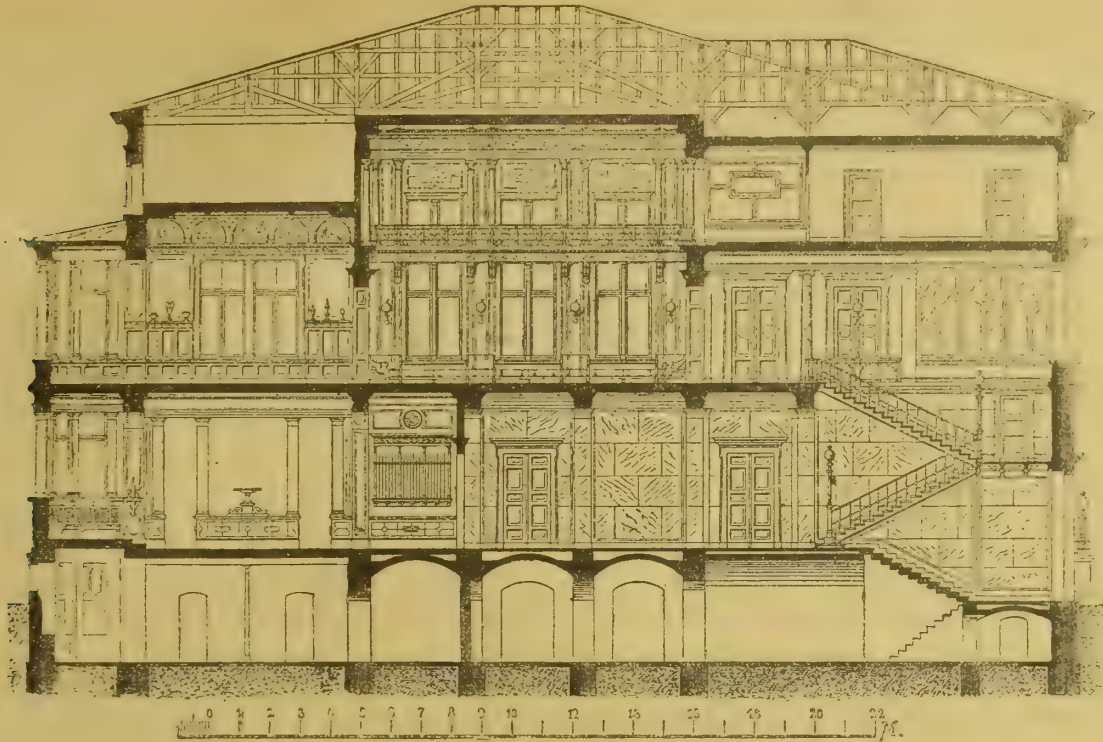


FIG. 3.

(see Section, Fig. 3). The arrangement of the double set of doors through which the visitor must pass to reach the inner hall, insures the exclusion of cold draughts of air, when the guests arrive or depart. Immediately in front of the entrance are two reception-rooms, A A, while on the left of the hall a billiard-room, C, is placed, with a refreshment-room, B, opening out of it at one end, and a buffet, D, at the other. In the corner of the buffet is the service staircase to the kitchens below. A reading-room of ample dimensions completes the ground floor.

On the first floor (Fig. 2), the centre of the building is occupied by the dancing-hall G, which will be seen by the section to be carried up higher than the surrounding rooms, and to have a musician's gallery over the entrance door. The

To reach the dancing-hall, one ascends the grand staircase from the inner entrance vestibule; from the top landing of this staircase is entered the ladies' saloon J, with the ladies' cloak-room

large supper-room, approached by two doors. This supper-room is also connected with the buffet, which during supper acts as the "service" room, and is in communication with the kitchens in the basement by a separate staircase and lifts.

Von Baumbach's Casino in Berlin (Figs. 4 and 5) is a smaller example of a public dancing-hall. The hall is situated in the centre of the block, and is two stories in height. On either side of the entrance are the cloakrooms (D) and retiring-rooms (E); the buffet (C), and small drawing-room (A); while a larger drawing-room (A) occupies nearly the whole of the other side of the dancing-hall (B). On the first-floor level are private boxes (G), with openings overlooking the dancing-room. On the same level is the minstrel gallery (K). Under the hall is a restaurant and billiard-room connected with a garden (X). There are two special features in this plan: the private boxes for spectators to watch the dancing, and the amount of space allowed for rooms in which to withdraw from the dancing, the area of these rooms being quite two-thirds of

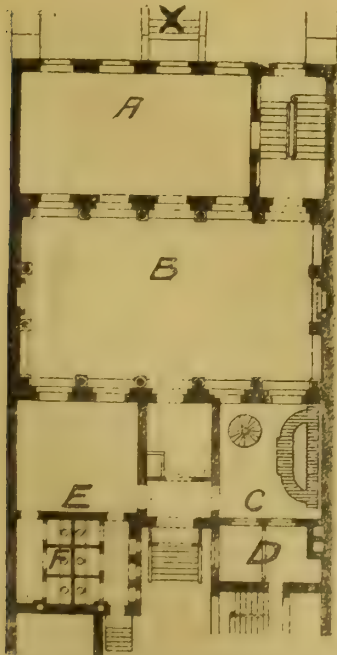


FIG. 4.—A, drawing-room; B, dancing-room; C, buffet; D, cloakroom; E, small drawing-room; F, lavatories; X, garden.

dancing-hall is arranged so that at one end there is an open balcony over the entrance vestibule below, which on warm evenings, is found to be a most pleasant addition to the room.



FIG. 5.—G, private boxes; H, upper part of dancing-room; I, cloakroom; K, minstrel gallery.

(L) close at hand, yet out of the direct line of traffic. This cloakroom is provided with two w.c.'s, and its position is admirably thought out, being close to the hall, and yet not in a conspicuous place. The gentlemen's retiring-rooms, w.c., urinals, &c., are on the ground-floor, immediately below the ladies' "toilette." The ladies' saloon is connected by a doorway with the dancing-hall. On the left of the landing of the grand staircase, and immediately opposite the ladies' saloon, is the drawing-room, for the use of those who wish to rest during the dances. From this is a passage-way, divided off from the dancing-room by an open colonnade, which leads to the buffet for light refreshments. This arrangement is excellent, as people can pass across the dancing hall without interfering with the dancers or being interfered with by them; at the same time it allows a space for people to stand in who wish to watch the dances without getting in their way. Leading out of the dancing-hall is a

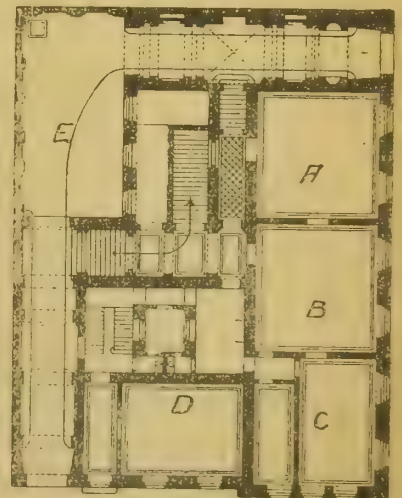


FIG. 6.—A, billiard-room; B C, dining-rooms; D, restaurant; E, courtyard.

the area of the dancing-room itself. No doubt this provision prevents the dancers being overcrowded by onlookers, and gives room for those who cease dancing to leave the floor space clear for those going on.

Adelphi's Casino in Vienna (Figs. 6 and 7) is



a building of a somewhat different character to the last, the dancing-room being connected with, and, in fact, subsidiary to, the dining-rooms (B C) and restaurant (D). The entrance to the public staircase is by a carriage-drive through a courtyard. The ground floor is used for restaurant and dining purposes, and the dancing-room (I) is situated on the first floor, with smoking-room (H), reading-room (G), card-room (K), and billiard-room (L) all in connection therewith.



FIG. 7.—H, smoking-room; G, reading-room; I, hall; K, card-room; L, billiard-room; M, cloakroom.

The smoking-room is also used as a reading-room, the other room being set aside for non-smokers.

There are several other kinds of casino which I have not mentioned here, besides the one at the seaside, which is only open some six months in the year: the one which partakes of the character of a club, that which is connected with a restaurant, and that which is a public dancing-room only.

There should be included in the list, the Continental town casino, which partakes more of the character of our provincial town hall, only that it is erected for public amusement only, not



FIG. 10.—A, terrace; B, hall; C, supper-room; D, billiard-room; E, clubroom; F, reading-room; G, gentlemen; H, vestibule; I, buffet; J, ladies' cloakroom; K, ladies' drawing-room; L, ladies' toilette.

ostensibly for public business and then used entirely for amusements, as is the case with some of our vestry halls.

Whatever the class or character of the building, and whatever way it is used, the architect would do well to remember that a casino is for the use of large numbers of people assembled together in a more or less confined space, from which easy ingress and egress must be provided. As the building is for an assembly standing and moving about, it is quite true that as many people will not be in the hall or room at one time

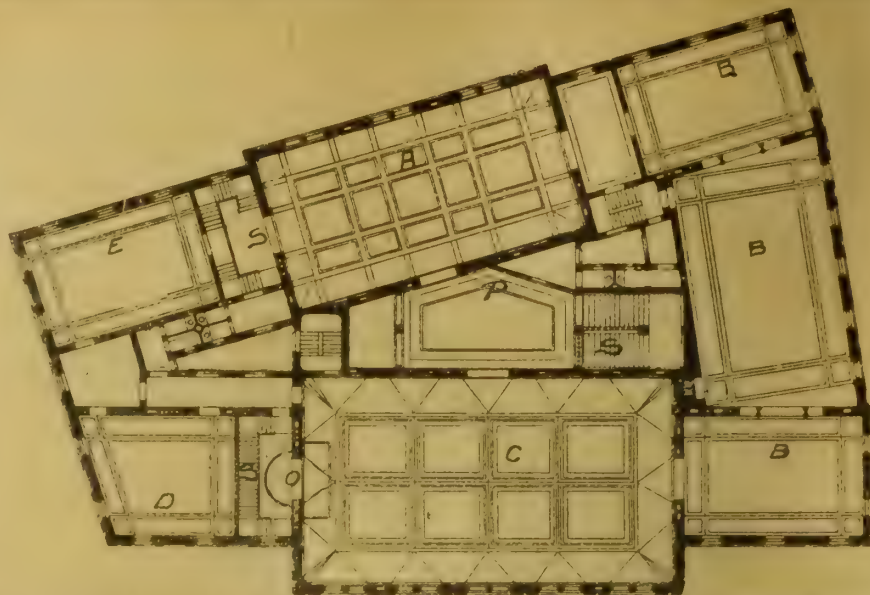


FIG. 8.—A, small hall; B B B, supper-rooms; C, large hall; D, smoking-room; E, refreshment-room; O, orchestra; P, landing vestibule; S, staircase.

as if the audience were packed and seated in rows of chairs; it is easier, no doubt, for a large number of dancers to reach the exits quickly than for a like number who have to rise from their seats and traverse the space between the rows of chairs. The former crowd is not a packed crowd. Naturally they have a certain freedom of movement which a seated audience cannot obtain.

regard to competitions. It appears that a jury of seventy-four was appointed to judge upon the eight sets of drawings sent in; of this jury twenty-four were technically trained experts and fifty were laymen. A firm of architects were awarded the premium of £60, but Mr. Wachtler was asked to carry out their design. He, however, promptly refused to do any such thing,

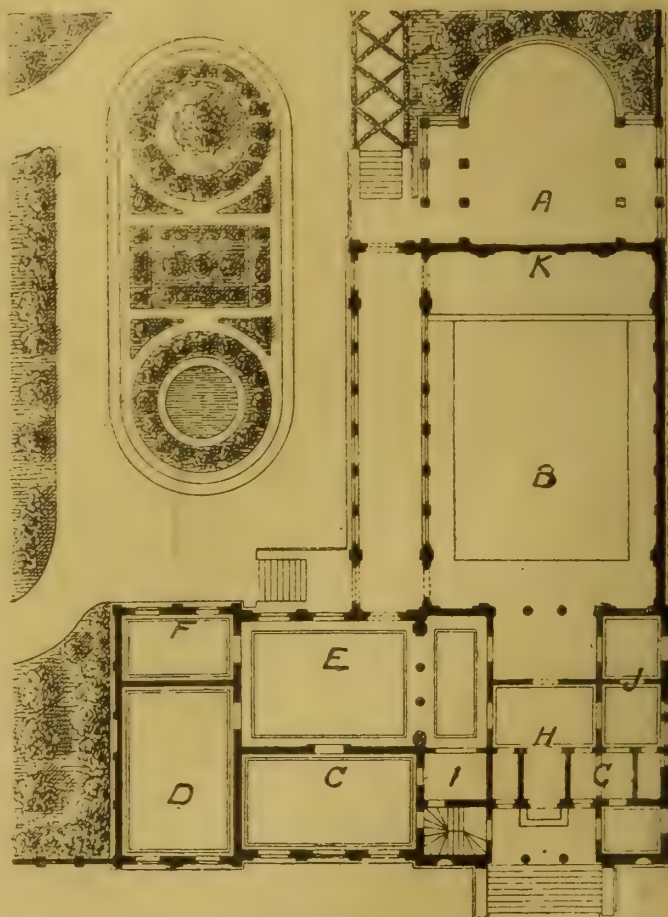


FIG. 11.—A, terrace; B, hall; C, supper-room; D, billiard-room; E, clubroom; F, reading-room; G, cloakroom; H, vestibule; I, buffet; J, ladies; K, platform.

But, in spite of this, the question of their safe exit should be most carefully considered.

In Figs. 8 and 9 are seen plan and section of the large and important Casino of Oldenberg. The architect of the building was Herr Ludwig Wachtler. This building was erected in 1870-72, and was the result of a competition which had rather a curious history—not an unusual thing with

but undertook to amend his own design to the suggestions of the committee. His original scheme was for a Gothic building, but this he abandoned, and produced the Renaissance design which was carried out.

The plan shows that the building covers a large and irregular site, and to arrange the rooms so that their proportion would be suitable for



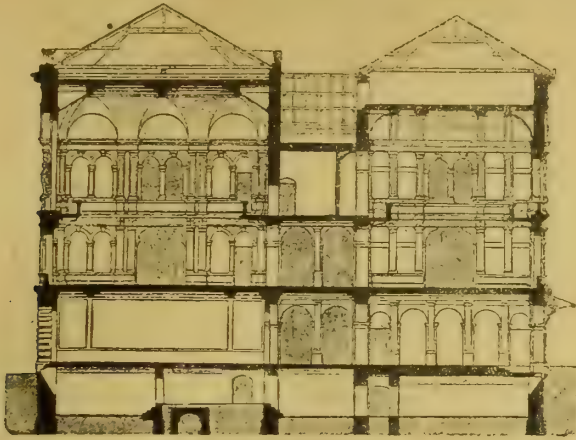


FIG. 9.—Section.

public purposes, was no easy matter. The irregularity, however, was very cleverly thrown into the centre of the plan by making the landing vestibule (P) at the top of the chief staircase follow the lines of the boundary of the site. Round this, the public rooms are grouped, and made rectangular. It will be seen that there are two halls, a larger (C) and a smaller (A), both available for dancing or public meetings. There are three public staircases, the chief one, which leads to the landing vestibule in the centre, and one at the end of each hall for additional means of exit. There is a suite of three supper-rooms (B, B, B) at one end of the building, with smoking-room (D) and refreshment-room (E) at the other. The cloak-room and lavatory accommodation is arranged in the middle of the building, with ventilation into the areas. The ground floor is occupied by shops, an exchange, and club-rooms. The large room is 23·4m. long by 13·85m. wide, and 15·7m. high, while the small room measures 18·97m. by 10·51m. by 12·01m. Round both of the rooms are galleries.

It may be interesting to glance at two plans designed by different architects for a casino for a small manufacturing town. Here it was required to introduce a terrace leading to a garden. Fig. 10 represents the plan that was carried out; Fig. 11, that of another architect. The accommodation is practically the same in both plans, but there is no doubt the grouping is far better in Fig. 10, and the plan more compact.

#### A FORM OF SPECIFICATION.

WE have been favoured in advance with a form of specification which Mr. G. St. Pierre Harris, A.R.I.B.A., is publishing, and which can be obtained of Mr. B. T. Batsford, High Holborn. Mr. Harris, who is a practising architect, originally prepared it for his own use in drawing up specifications, chiefly for country houses, and he has found it save so much time and thought that he has been induced to publish it for the use of others. The compiler and editor says that it has been examined by Messrs. C. Stanger and Son, quantity surveyors, so that it comes out under good credentials as to its practical usefulness. We have looked over some of the trades, which are conveniently broken up into clauses with marginal headings, with blanks for filling in the necessary dimensions and particulars. Thus, under "Excavator" we have clauses headed "General," relating to provision of water, carriage of materials, clearance of site, setting out, giving notices, &c. Under "Trenches," all footings are specified of certain depths, ramming and levelling, &c. Under "Surface" is provided the taking off surface and wheeling away; under "Levelling," all the works to complete the surface round building. "Cellar," "Cesspool," "R. W. Tank," &c., are other subheadings. Bricklaying is pretty fully outlined; but we do not see any special clauses relating to terracotta or hollow walls. Under "Damp Course," "two courses of Bangor slates in cement, with lapped joints," is provided, but no reference is made to perforated stoneware slabs, asphalt, or lead. Gulleys, inspection chamber, interceptor trap, testing drains are provided. Under "Mason," the usual clauses are given, though references to dressings, stone in quoins, architraves, entablatures, columns, are omitted. The trades of "Carpenter, Joiner, and Ironmonger" appear to

be pretty complete for ordinary houses. The description of flooring might have been made a little more detailed, so as to include parquet floors, wood-block flooring, dadoes, wainscoting, fireproof floors. It would be useful also to include in the other trades an outline form for wiring and electric lighting fittings, for decorative materials and half-timber work. As it is, Mr. Harris's form will be found to save much thought and labour in preparing a specification. The chief hindrance in writing a specification is generally found to be in remembering the various items and in specifying details and fittings, and a form of this kind enables the architect to commence and continue the work without interruption or reference to other documents, and in most cases merely to fill in the blanks.

#### OBITUARY.

WE regret to announce the death, at the age of 49 years, of Mr. JAMES HICKS, M.S.A., of Highfield, Redruth. Mr. Hicks, when attending a funeral at Treleigh on Wednesday, took a chill, and died on Friday from inflammation of the bowels. He was the son of the late Mr. John Hicks, surveyor, and was articled to Mr. John Watson, of Torquay. Five-and-twenty years ago he commenced independent practice at Redruth, and has for many years been one of the best-known architects in West Cornwall. Among his works are Towan House, for Mr. Alfred Lanyon, at Redruth, a stone-faced villa illustrated in the BUILDING NEWS so far back as March 3, 1871; a villa at Camborne, of which a perspective and plans were given in our issue of Dec. 8, 1871; and the Hunt Memorial Museum, Redruth. He was joint architect with Mr. J. P. Seddon, F.R.I.B.A., of Grosvenor-road, S.W., for St. Andrew's Church in Redruth, and carried out the restoration of the parish church in that town. He submitted a design for Truro Cathedral, Decorated in style, with lofty central tower, which was illustrated in our pages, June 21st, 1878. It was to Mr. Hicks's intervention the inhabitants of Redruth owe the free library. He met and represented the matter to Mr. J. Passmore Edwards, and obtained the promise of funds for the building, which was carried out from his designs, and was illustrated in the BUILDING NEWS for August 3, 1894. Mr. Hicks was also the architect of the Art Gallery given by Mr. Passmore Edwards to Newlyn; the design was published in our issue of Feb. 8, 1895. Mr. Hicks was for many years local agent for Lord Clinton, and he was manager and promoter of Carn Marth Granite Quarries, from which very large quantities of granite have been raised and used in the county and exported, and for years a useful industry as a labour factor. "Erratic and peculiar, Mr. Hicks was," says the *Western Morning News*, "liberal in his subscriptions. In politics and local government Mr. Hicks has been conspicuous. He was one of the original and most prominent members of the Redruth Ratepayers' Association, and on the formation of the local district council, for which there was a tremendous competition, Mr. James Hicks and his brother, Mr. John Hicks, were returned near the head of the poll. At the meetings of the district council he has throughout preserved an independent attitude, strenuously opposing the water scheme now being carried through." Mr. Hicks had been a member of the Society of Architects since 1885, and served for some years as

member of council and vice-president. His son, Mr. H. Hicks, has been one of his chief assistants in his office.

WE also have to record the death of Mr. W. HORTON, of the well-known firm of Messrs. Horton and Bridgford, F.R.I.B.A., architects, Manchester, at the age of 63. The deceased gentleman was respected and esteemed by all with whom he came in contact.

MR. CHARLES B. ATWOOD, the architect of the Peristyle, the Fine-Art Building, and the Terminal Station at the Chicago Exhibition, and the designer of many other important buildings, died a fortnight since in Chicago. Mr. Atwood was born in Charlestown, Mass., in 1849. He received his professional education in the offices of Messrs. Ware and Van Brunt, of Boston, and soon became locally known as a very skilful and rapid draughtsman and designer. He established himself in business on his own account in Boston in 1872, and designed several important structures in and about Worcester, Mass. Three years later, he was engaged by Messrs. Herter Brothers, in New York, to take charge of the architectural part of their work; and, in connection with them, designed most of the detail for the W. H. Vanderbilt mansions in New York, and for several other fine houses. Later, he was engaged on his own account to design and build the two houses which Mr. Vanderbilt presented to his daughters, Mrs. Twombly and Mrs. Webb. He won a large number of premiums in competitions, and thus gained also a wide reputation. He was early chosen designer-in-chief to the World's Fair Exhibition at Chicago Exhibition, and in that capacity turned out in a short time an immense amount of work, of which some portions were among the most brilliant architectural achievements of the Exposition. The *American Architect*, in an obituary notice, mentions that Mr. Atwood made in early days a careful study of the New York City Hall, and had measured, sketched, and drawn out every detail and feature. Returning to New York after a prolonged absence from the city, he learned that the first competition for the new city hall would close the next day. He at once set to work, and within less than twenty-four hours had produced with his own hands the full set of drawings—with one exception—that the conditions required. When the experts examined the drawings submitted, it was found that Atwood's scheme must, under the conditions, be ruled out because of its incompleteness; but as it was really superior to the design of any other competitor, they recommended that he should be given a special prize and be invited to complete his drawings, and this was done.

#### CHIPS.

The Science and Art Department has received, through the Foreign Office, a communication stating that an International Exhibition will be held in Brussels in 1897.

Mr. Aldrich, formerly Commissioner of Public Works for Chicago, and now representative to the United States Congress from Illinois, has introduced a Bill in relation to the designing of public buildings, agreeing substantially with the McKaig Bill, which failed of passage last winter.

The ratepayers of Eastbourne have, by a small majority, refused their sanction to the Bill the corporation of that town intended to promote for the purchase of the local waterworks.

The Duke of York has intimated to the Leyton District Council that he accepts their invitation to open the new public offices and technical institute at Leyton, on a date to be fixed in March next, and that the Duchess of York will accompany him.

The Department of Science and Art has received, through the Foreign Office, a communication from Her Majesty's Consul at Barcelona, stating that it is proposed to hold a Fine Art and Industrial Exhibition in that city, commencing on the 23rd April next.

Rapid strides are being made in the construction of the new cattle market at Stamford. The site is the George Hotel paddock, near the M.R. station, and the work is being executed from the designs of Mr. Jas. Richardson, borough surveyor. Mr. J. Ward is acting as the clerk of the works, and the whole of the work is being carried out by Mr. John Woolston, contractor, of Stamford. The market embraces an area of about two acres.

The Bishop of St. Asaph dedicated on Friday a new clock and a peal of six bells, which have been erected on the tower of Abergele parish church by public subscription.



## CONTENTS.

The Track Behind Us .....	51
Old Masters at the Royal Academy .....	51
Designing of Steel Bridges, Theoretical and Practical.	
—XXV. ....	53
London City Churches .....	54
The Sculptures in the Lady-Chapel, Ely .....	55
Graphical Determination of the Stresses in the Members of a Collar-Beam Roof-Truss.—II. ....	56
Concert Halls and Assembly Rooms.—VIII. ....	56
A Form of Specification .....	59
Obituary .....	59
Our Illustrations .....	60
Architectural and Archaeological Societies .....	60
The Building News Directory .....	IX.
Cast Iron in Builder's and Contractor's Work.—XIII. ....	77
Books Received .....	78
Building Intelligence .....	78
Correspondence .....	79
Intercommunication .....	79
Legal .....	80
Legal Intelligence .....	80
Our Office Table .....	80
Meetings for the Ensuing Week .....	81
Trade News .....	81
Tenders .....	81

## ILLUSTRATIONS.

THE GREAT HALL OF THE CARPENTERS' COMPANY.—MESSRS. REDFERN'S NEW PREMISES, XXVI. AND XXVII. CONDUIT STREET, W.—TEWKESBURY ABBEY.—ST. ANNE'S HOUSE, CLAPHAM, S.W.—PUBLIC BATHS, DEPTFORD.

## Our Illustrations.

CITY GUILDS, NO. XV.—THE CARPENTERS' HALL.

THIS large Classic-like building, situated in London-wall, is one of the most palatial and massively-designed modern halls belonging to the City Guilds. The late Mr. W. W. Pocock, the architect to the company, designed it. We give an interior view of the great hall to-day by a specially-taken photograph by Mr. J. T. Sandell, showing the apartment as viewed from the ladies' gallery. The old hall was one of the few which escaped the Great Fire, which extended in every direction in its immediate locality. This building, which made way for the present premises, was originally erected in 1429; the walls of Old London faced it and Moorfields, Finsbury, extended beyond northward to the open meadows of Merry Islington. Outside, the old hall possessed no features worthy of remark or traces of antiquity. The court-rooms were built in 1664, and in 1780 W. Jupp was the architect of the staircase and entrance hall. A bust of Inigo Jones, by Bacon, enriched the street archway. The spacious character of the present buildings gives an air of importance and wealth; and popularly, no doubt the architecture would be considered impressive. The good useful work of the Company in the direction of extending technical education, its encouragement to the craft whose name it bears, and the exhibitions of old and new woodwork held in the Company's hall are deserving of the highest commendation. Lectures inaugurated and provided by the Guild have for many years exerted a widespread and useful influence of much practical utility. The Charter of the Carpenters' Company, in its earliest form, bears the date of 1174 A.D.; their common seal and grant of arms, 1466; but a Guild of Carpentry is noticed in 1421-2. The books of the Company bear many proofs of their power over the trade, and the first entry is dated 1438, a fairly early record. Among the treasures of the Hall is the celebrated octagonal table, bearing the year 1606, which is probably the earliest dated piece of Jacobean furniture known. The chair, which is usually shown with the last-named piece, though not dated, is possibly older. Sketches of both will be found in the BUILDING NEWS for June 23, 1893. The Company also possesses four very curious caps or gowns (the oldest 1561), still used by the Master and Wardens. Among their plate are three silver-gilt hanaps (1611, 12, 28), which are borne in procession round the Hall on election day. The new Warden is crowned, after the old custom of the Guild, and the garlands used for the purpose are the same which were in the possession of the Company three centuries ago. The Beadle's staff, which is said to be the hand-somest possessed by any of the City companies, is

of silver, and consists of a square pillar and four shields, with the Company's arms and motto; it is dated 1725.

XXVI. AND XXVII. CONDUIT STREET, W.

THIS building was erected in 1893, for the business of ladies' tailors. The use of the ground and first-floor show-rooms, and the exigencies of the business dictated the form of these two stories, and suggested their different treatment to that of the upper part, which forms the manufacturing section of the premises up to the main cornice, when the building becomes residential and more ornate. The building is carried out in pink terracotta and red brick, the terracotta having been manufactured by Messrs. Doulton and Co., by their cellular process, and was the second building ever executed in that manner. The truth of the lines and the accuracy of the parts is most exceptional for terracotta. The bricks were specially made 1½ in. thick, by Messrs. Thomas Lawrence and Son, of Bracknell, and the joints are in cement, struck with a round tool some distance back from the face. The construction of the building, which is principally fireproof, is carried almost entirely on iron stanchions, columns, and girders, the iron extending right to the roof. The ironwork, which was most intricate, was executed by the Butterley Company. The whole of the ground and first floors throughout, which are used for show-rooms and fitting-rooms, are most elaborately fitted and decorated with architectural woodwork, and plaster painted. The drawing shows the building as originally designed. The effects of a light and air action unfortunately reduced the building by one story, very much to its detriment. The architect is Mr. A. H. Kersey, F.R.I.B.A., F.S.I., 21, Finsbury-pavement, E.C. The work throughout was executed by the contractors, Messrs. G. H. and A. Bywaters and Sons, of 10, King-street, Regent-street, W.

THE CHAPEL OF ST. EDMUND THE MARTYR, TEWKESBURY ABBEY CHURCH.

THE accompanying pencil drawing, by Mr. Alfred J. Dunn, is one of the admirable studies made by him last summer as R.I.B.A. Travelling Student. He writes:—The chapel is one of a series of semi-octagonal chapels surrounding the east end of the presbytery, each of which communicates with the church by a beautifully-moulded arch. The vaulting of the chapel is particularly beautiful, and the carved bosses are rich in figure subjects, illustrating the life of St. Edmund. A stone Decorated screen originally separated the chapel from the ambulatory in a similar manner to that of the chapel of St. Margaret, a portion of which screen is shown in the drawing. The positions of two altars are clearly seen upon the walls beneath the windows on the N.E. side, the altars themselves having been removed at the time of the Reformation. Placed beneath the beautifully-moulded obtuse arch is the cenotaph of John Wykeman, the last abbot of Tewkesbury, who surrendered the abbey on January 9, 1539, and is believed to have intended this for his tomb. Wykeman was made first Bishop of Gloucester in 1541, and was buried at Forthampton, a village some three miles S.W. of Tewkesbury.

SOUTH AISLE OF THE NAVE, TEWKESBURY ABBEY CHURCH.

THE second sketch on our double-page plate was lent us by Mr. C. E. Mallows, and his clever view is taken from the north, looking into the south aisle of the nave. It illustrates completely one bay of the grandly massive arcade, which gives so much individual nobility of proportion to this famous church. The plate forms an interesting sequel to the series of Gloucestershire sketches given by us last August.

ST. ANNE'S HOUSE AND MISSION HALL, CLAPHAM.

THIS building has been erected at the corner of Venn-street and Bromells-road, Clapham, on a site given by the rector of Clapham. It will be vested in trustees on behalf of the parish church of Clapham, and is intended to be used for mission services, Bible classes, entertainments, working men's club, and other church and parochial purposes. The front building next Bromells-road contains club-rooms, classrooms, soup-kitchen, and residence for the lady superintendent. The mission hall, which is 60 ft. by 40 ft., is in the rear, having entrances from Venn-street. The cost has been about £4,000. The buildings have been erected from the designs of Mr. E. Blakeway T'Anson, M.A., of 7A, Laurence Pountney-hill. Mr. Carmichael, of Wandsworth,

was the contractor. The drawing given by us to-day was exhibited at the Royal Academy last season.

PUBLIC BATHS, WASHHOUSES, AND MUNICIPAL OFFICES, DEPTFORD.

WE illustrated the plans and view of these buildings, now being erected in New Cross-road, when we gave an account of the undertaking in the BUILDING NEWS for Oct. 18th last. To-day we print a copy of the working detail of the front main gable to the façade of the baths portion of the scheme. The architect is Mr. Thomas Dinwiddy, of Greenwich.

[By an unwonted mistake made at the last moment before going to press, it was inadvertently stated that Mr. T. G. Lucas's design, which we illustrated on the 3rd inst., for a town church, was awarded the Royal Academy Gold Medal. The description to accompany the illustration was sent down to the printers, but it was unaccountably lost. The medal was awarded to Mr. Pieter Rodeck, as we had previously stated.]

## ARCHITECTURAL &amp; ARCHAEOLOGICAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—At the ordinary monthly meeting held in the rooms on Tuesday, Mr. A. N. Paterson, M.A., in the chair, Mr. George Hill, architect, delivered a paper, subject, "An Architectural Aim." Mr. Hill, after drawing attention to the great variety of manner of expression prevailing in the work, not only of architects in general, but of individual architects at the present day, and the desirability of a greater uniformity of aim in this direction, sought by striking a comparison between the in many respects parallel studies of literature and architecture, and taking guidance from the more clearly defined and more generally accepted criterion which holds sway in the former, to distinguish, amidst the Babel of architectural expression which is characteristic of the present, what is that which is peculiarly Scottish, and how Scotland should express herself to-day in a manner which shall be fit for the present, and be the climax of all that has been in the past. A discussion followed, and Mr. Hill was awarded the usual vote of thanks. An exceedingly interesting exhibition of photographs of Scotch Domestic architecture, lent by Mr. A. N. Paterson, were shown in the hall, and will remain on exhibition for a fortnight.

MANCHESTER SOCIETY OF ARCHITECTS (INCORPORATED).—At a sessional papers meeting held January 7th, the president, Mr. John Holden, in the chair, Mr. J. J. Thomas, M.I.M.E., of Kendal, read a paper on "Westmoreland Slates: their Geology, Chemistry, and Architectural Value." After giving statistics—showing that in 1894 15,000 men were employed in the slate quarries of Great Britain and Ireland, that they produced 461,673 tons of slates, amounting in value to £1,171,366, out of which total £940,553 worth were used in this country, the remainder being exported to foreign countries—he treated on the geological position and extent of the slate-producing area of the Lake district, the chemical composition of slates, and the action upon them of impure atmospheres and various degrees of temperature, and the general description of Westmoreland slate quarrying, the method of preparing the slates, cleavage, and architectural value. A hearty vote of thanks was accorded to Mr. Thomas for his valuable and interesting paper, which was illustrated by numerous lime-light views.

The restoration of the parish church of Barton-under-Needwood is proceeding. Contracts have been accepted to the amount of £652 9s. 2d., and, in addition to these, a further outlay has been incurred for work at the east end of the chancel, which will bring the sum to nearly £700.

New board schools, which have been erected in Bishop-road, Horfield, near Bristol, were opened on Friday. The schools have been erected at a cost of £6,500 by Mr. H. J. Rossiter, from designs by Mr. W. V. Gough, both of Bristol. The building accommodates 600 children, and it is divided into three departments. There are large assembly halls for the boys and girls, and these apartments, by the removal of a sliding partition, can be converted into one room. The classrooms are eight in number. There are also an infants' schoolroom, cookery-room, and caretaker's house. The building is in the 16th century style, and is of Pennant stone, with freestone dressings, and the roof is tiled.











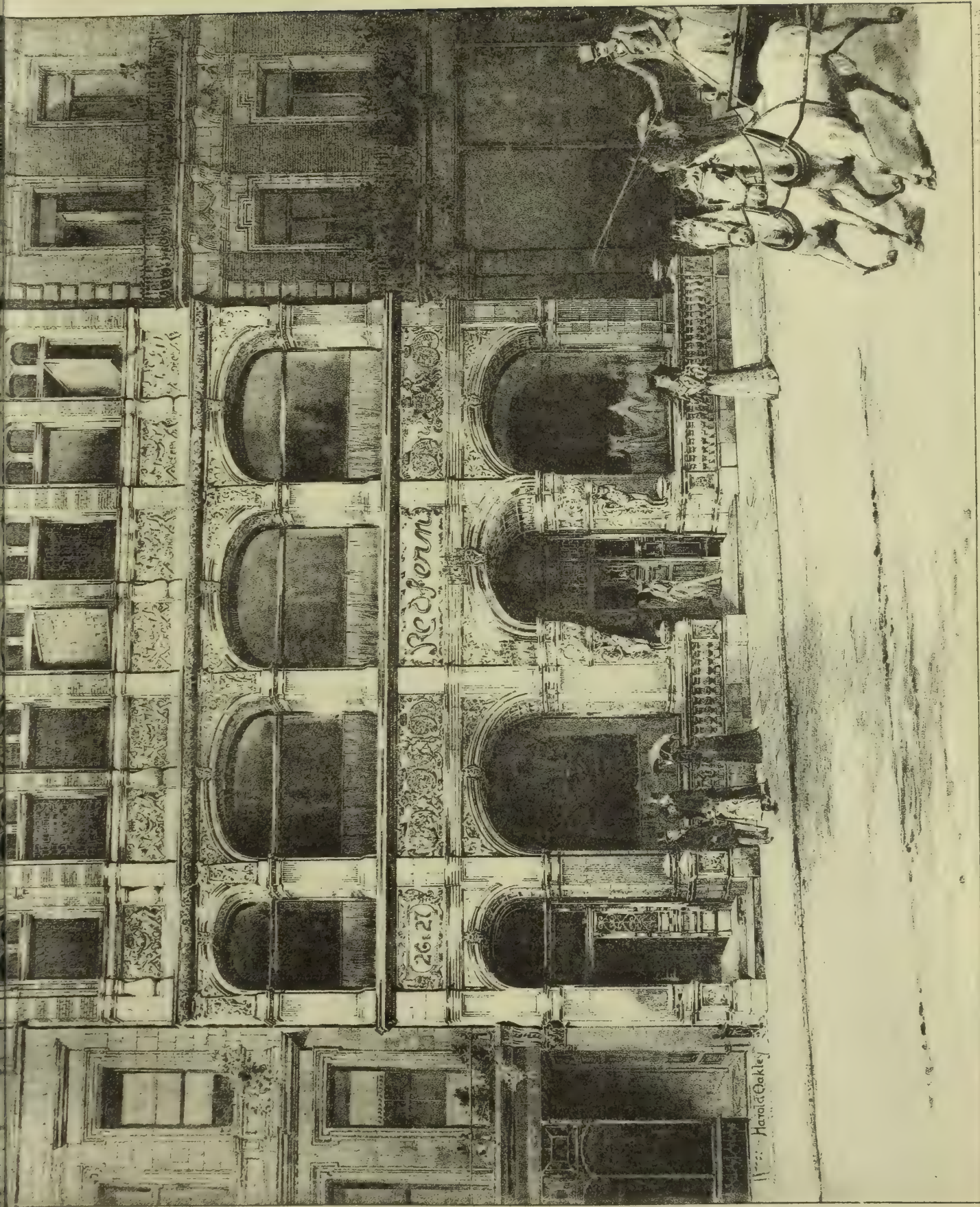


PHOTO TINT BY A. H. KERSEY FRUPA ARCHT.

MESSES REDFERN'S NEW PREMISES NOS 26 & 27 CONDUIT ST W A H KERSEY FRUPA ARCHT

Harold Oakley















JAN. 10, 1896.



PLATE NO. 5

"PHOTO-TINT" by James Assheton, Queen Square, London, W.C.



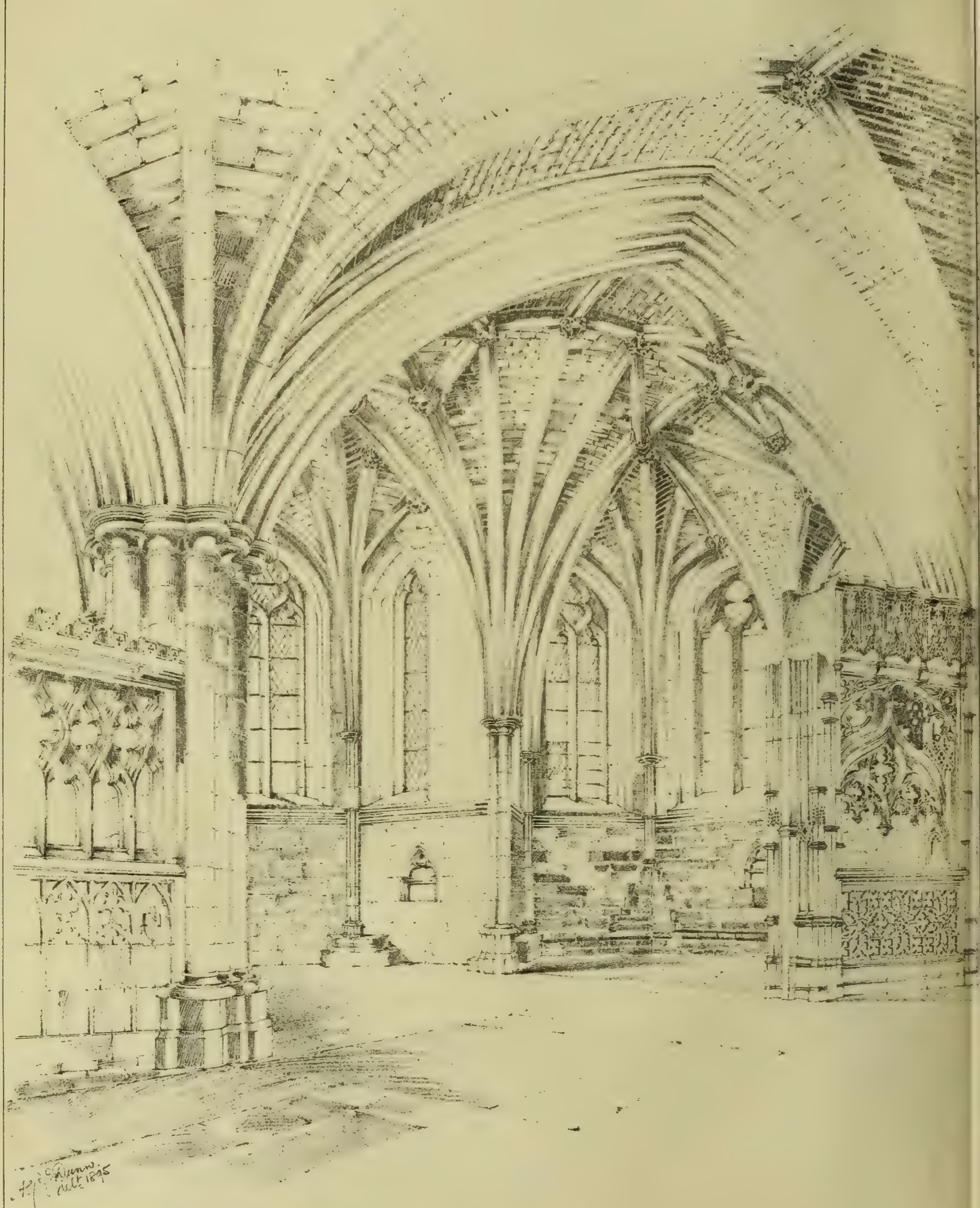




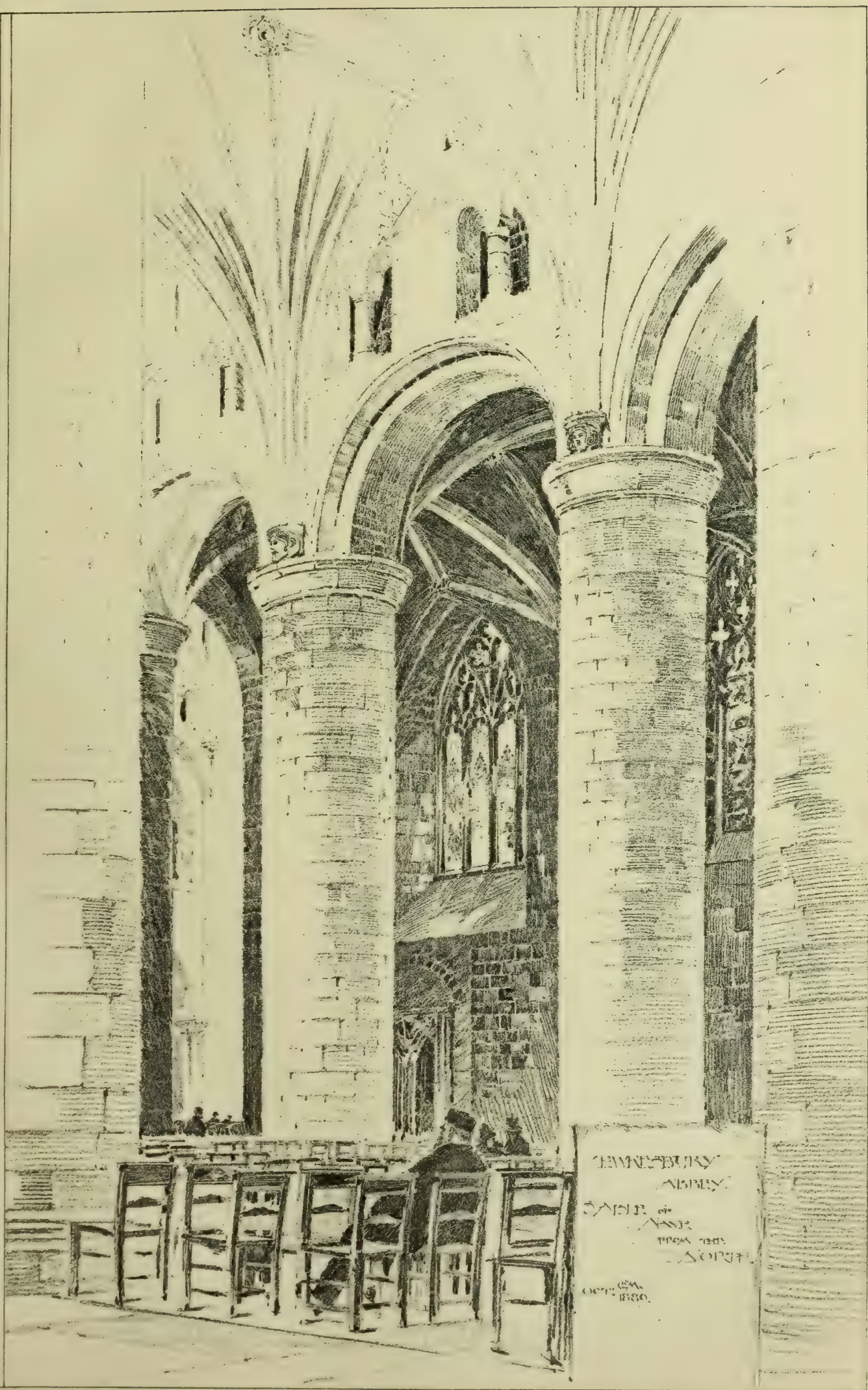




Tewkesbury Abbey Ch.  
Chapel of St Edmund Martyr







TEMPLE  
ABBEY  
CHURCH  
NEW YORK  
1896





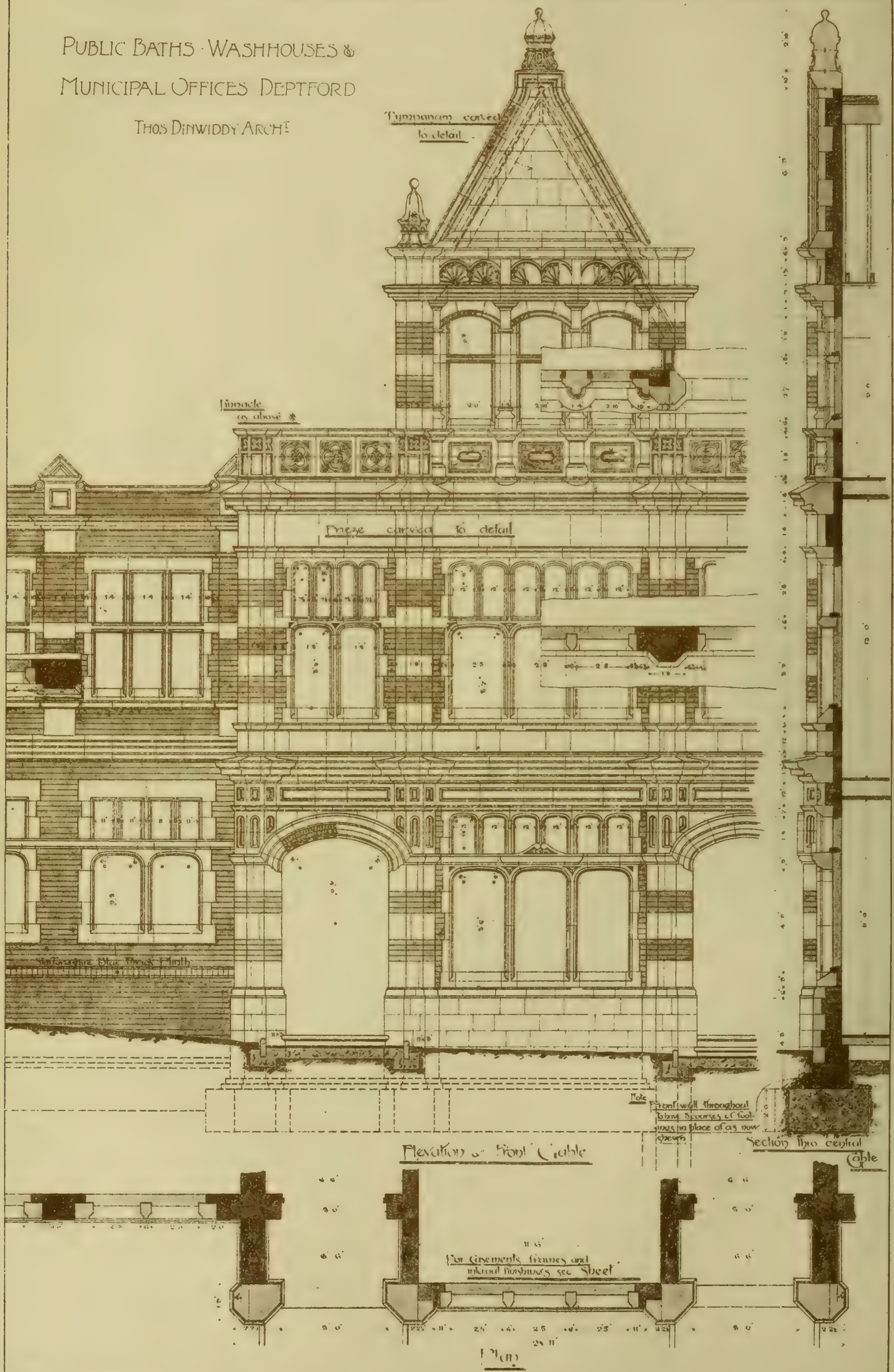






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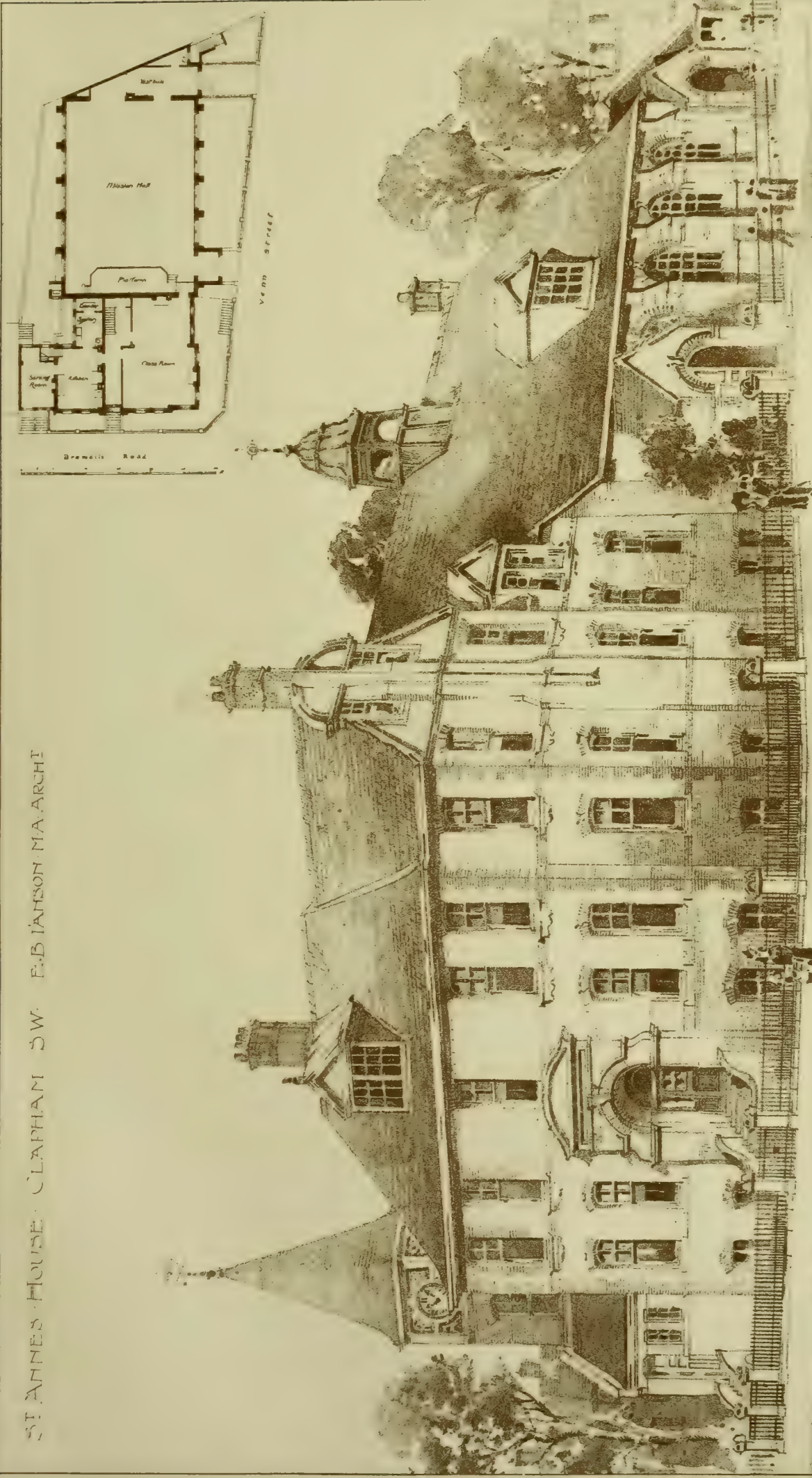
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### SCOTTISH AND ENGLISH ART.

THERE was a time, and not a distant one, when our Northern neighbours seemed to pride themselves on everything belonging to Scotland except its architecture. Its customs and its dialects, its songs and its legends, they cherished with devotion; but its art they renounced as unworthy of notice. Here they were nothing if not Classical. Edinburgh was to be the modern Athens, and Glasgow's ablest architect set himself to build in Modern Greek. The great houses were Italian; the churches were Roman in style, if aggressively Anti-Roman in purpose. Even Burns himself, the most national and local of poets, was commemorated, not by anything sprung from his own land, but by a bad copy of the Temple of Vesta at Tivoli. Sir Walter Scott did much to change this fashion. He brought Gothic in; but even he did not bring in Scottish Gothic. Some imitation of the Scotch castellated style he perhaps produced in castles and domestic buildings; but ecclesiastical work in the North has remained, for the most part, "high English." The church at Dunbar, built in the earlier part of this century, shows what was aimed at then. It is an attempt at Perpendicular, no better and no worse than attempts of the same date in London, and not differing from them as to detail in any respect. The churches of more recent date have, in the main, been equally devoid of local feeling. They might have been picked up in a Metropolitan suburb and transplanted, for all that is distinctive or characteristic about them. Mr. J. J. Stevenson and some others, however, in comparatively recent years have done something towards stocking their country once more with the indigenous produce of its soil; and Mr. George Hill has just been advocating the same course before the Glasgow Architectural Association. Mr. A. N. Paterson, too, has lent for exhibition an interesting collection of photographs, illustrating the domestic architecture of the land, and these are now on view there at the Association rooms.

To such a movement as this English architects will be foremost in wishing success. They have enough of their own traditional types at home. When they go North, they like to see what is typically Northern. Taken by itself, indeed, Southern art may be more perfect: it grew up in richer fields and under more favourable conditions. The chapel of King's College, Cambridge, for instance, is much more impressive to the ordinary man than that of King's College, Aberdeen. Its wonderful vaulting, its elaborate glazing, have nothing to match them in its Scottish namesake. There is an air of "money no object" about it, which, if it does not lift the beholder's soul, can at least make his body feel shabby. It is quite otherwise at Aberdeen. It has no soaring proportions—no self-asserting splendour; it is sturdy and stunted, as Scottish buildings are. All the more, it is fitted to its station. There is an architecture of rich plains and meadows, which looks as if no blast of heaven had ever visited it too roughly. It has shot upwards, amidst showers and sunshine; every stalk has grown to its appointed length, and every bud has opened to a perfect flower. Such architecture we find at Salisbury, at Lincoln, at Louth; but, with the rarest exceptions, we do not find it across the Border. There the winters are long, the summers are short; and nature, except in the sheltered glens,

seems to be fighting for its life. To harmonise with it, art must seem so too, and this, where it is most characteristic, is just its aspect. This expression, it is true, does not come out much in the 13th-century work of the larger abbeys. Dryburgh, for instance, is almost an English building; but as the years went on, style beyond the Tweed grew bolder and more distinctive. Like foreign plants sown by some accident on an ocean island, it dropped, in the course of ages, many of its original characters; it developed new ones to suit its new situation, and became, in the end, a decidedly separate variety, if not absolutely another species.

It is an instinct of the Yorkshireman, Mrs. Gaskell somewhere remarks, to meet every assertion with a direct negative. If you casually remark that it is a fine day, his first impulse is to reply, "No, it isn't." There is something of this spirit of contradiction in Scottish architecture. It seems to have observed what qualities were sought for in other lands, and purposely to have set itself to avoid them. "I won't be graceful—I won't be elegant—I won't be well-proportioned," one seems to hear it saying. Much of it is like the trees which surround it—low, thorn-like, twisted—cut into strange shapes by the gales, as by a sand-blast. It is full of odd fancies, too. It does things that are against all rule and custom—and does them for no reason except the pleasure of defiance. What should induce it, for example, to make its mullions, as at Aberdeen, two or three times as thick as the tracery which springs from them? What should make its spires so short and broken-backed? And why should it love to design them as if they were not in the centre of the towers they start from? Why does it put a raking string—as at Melrose?—an arrangement which seems to give the "corbie steps" an unsafe sloping bed, instead of a secure level one. Why does it mix Geometrical tracery up with Flamboyant, as at St. Salvador's Church in the town of St. Andrew's; and Flowing Decorated with Perpendicular, as at St. Monance, Fifeshire? Why did it make Roslyn the ugliest of chapels outside, when it was able to make it the fairest within? And how, in spite of all these, and a thousand other vagaries, does it persuade you to like it better the longer you look at it? It is full of beauty, but it will not let its beauty be seen at the first glance. It is a beauty more of detail than of mass, and even then, a beauty more of thought and suggestion than of line and form.

Scottish architecture, like Scottish language, has many French importations. They mix oddly enough, these products of grace and fashion, with the quaint, homely things amongst which they have taken up their abode. The elliptical, or quasi-elliptical arches of the Burgundian style seem, at first, much out of place amongst the practical-looking buttresses and severely plain strings of King's College, Aberdeen. That of the west window has the fashionable air taken out of it by a heavy dividing pier, carried up in its centre right to the keystone. It was no aim of the architect's to get a French character; he clearly aimed *not* to get it. An arch of this shape happened to suit him, and he took it. But he made it understand that its days of elegance were over. It had hard work to do and rough weather to stand against, and he propped it and buttressed it and strengthened it that it might be equal to its duties. There is no French refinement either in the tower-crown which adjoins it. It is dumber than the Edinburgh one, which, again, is flatter and heavier than that of St. Nicholas, Newcastle. Its weatherings are low-pitched, and its pinnacles are mere pyramids, beset with diminutive crockets. Yet its highest feature, the stone coronet which surmounts it all, does seem a little like a faded memory of that at Ouden rd, or

perhaps of one in Spain. A century or so after it was erected Spanish ideas came into vogue. Heriot's Hospital, at Edinburgh, is full of them—a circumstance seemingly overlooked by those of our North-country friends who adopt everything that comes from Italy, and taboo everything that comes from Spain.

There is a temptation here to enlarge on what seems to be popularly considered a specially Scottish feature—the tower-crown, above referred to. That and the stepped gable are the first things, if not too often the last, which suggest themselves to the modern man who wants to give a Caledonian flavour to his work. Yet the finest specimen is a Northumbrian one; and save a poor specimen at Glasgow, the two named in the last paragraph are, we believe, the only ones now remaining beyond the border. Where did the type originate? What suggested it? When did it arise? It looks like a Gothic attempt at imitating the Renaissance dome and cupola; a skeleton model of it, instead of a solid one. If it is so, what Renaissance examples did it spring from? There are plenty in Spain to which it approaches very nearly; but most of them must be later in date than St. Nicholas. The Renaissance domes there—that is, the external domes, of Salamanca and Zamora, for instance—are much older; but they have no cupolas above them, and the cupola is of the essence of the idea. The old Bow Church, Cheapside, appears to have been finished in this way; and in the market crosses of Salisbury and Chichester we have what is practically the same thing applied to a polygonal plan. It is less generally known, perhaps, that there is a graceful example, on a small scale, over the well at Pinkie House, Musselburgh. If it were in England, we might call it Elizabethan. It is square on plan. Each side is pierced with a round-headed opening, between two panelled pilasters. At each corner is a square detached column of Classic proportions, with a sort of Doric capital, and on these rest a cornice, frieze, and architrave. The columns carry four obelisks, by way of pinnacles. Against these the flying buttresses abut, arched on front and back, and diminishing as they rise. They are decorated with a sort of acanthus-leaf crockets, and end at top in an octagonal pedestal and pendant, on which is placed a well-designed vase.

Cornwall is in some respects like a bit of Scotland, and in one point there is a singular resemblance between the Cornish and the Scottish detail of the Late Gothic period. This is in the carving. In other points of their ecclesiastical architecture similar causes have to some extent produced similar results; but these results do not go beyond broad general effects. In both districts the churches are low, the construction strong and coarse; but the Western one shows little of the foreign feeling which is so manifest in the North. France and Cornwall were far from being on the same friendly terms as France and Scotland; in fact, the Fowey pirates or privateers, whichever title they deserve, were long a thorn in the side of our neighbours across the Channel. Consequently, Flamboyant forms were incorporated with the indigenous ones there. Cornish art, in the main, is strongly English Perpendicular, changed and dwarfed by having spread into a relatively poor country, where it could only express itself in rather intractable materials. It was the very hardness of the granite, which was the local substitute for freestone, that made the Cornish masons hit upon the very interesting type of work we may see, amongst other places, on the fine porch at Launceston. Granite does not seem the sort of thing which would naturally lead to a profusion of surface-ornament, and yet this, in many cases, was the effect of employing it. The old workmen got hold of an easy and satisfactory way of dealing with it. They seem to have outlined their patterns so as nearly to cover



the slabs, and then to have picked away, with a pointed hammer, the small spaces that were left. The carving was thus almost flat on its face, and almost square on its edges, and it showed as a light pattern on a ground of sharp shadow. A great many forms could be effectively suggested in this way. Not only tracery, and pinnacles, and shields were worked so, but sacred monograms, leaf-carving, the Tudor rose and other flowers, and even figures of knights and dragons. All these things are vastly more interesting than the everlasting panelling and cusping which covers so much of the 15th and 16th century walling in Middle England. The Scottish carving of that date is, at its best, more interesting still. If it was not executed quite in the same way as the Cornish, it had much the same effect, but an effect more highly developed, carried further and better finished. There is no need to refer to it at Roslyn, where, as everyone knows, it is simply wonderful. There are bits here and there in a multitude of places less familiar to the tourist, and the knack of making it interesting spread—as it did also in our western counties—from the mason to the woodworker. The stalls at Aberdeen, with the freshness and variety of their devices, match, or overmatch the rood-screens of South Devon.

We may chiefly thank local customs and local preferences for it if any of us can still find enough worth seeing at a distance to recompense us for the trouble of going away from home. They have come down from the time when every county stood up for itself, and sought, in honest rivalry, to outdo every other. Sometimes, no doubt, this went too far, as when the Devonshire and Somerset men, in "Lorna Doone," fought a pitched battle between themselves, instead of turning their guns on the robbers they had joined to destroy. But, on the whole, it was a useful emulation, which is ill-exchanged for the modern rivalry as to which little town shall make itself most like a third-rate London suburb. Curiously enough, it is now the "local man" who generally wants to take all the local colour out of his own town, and it is the architect from a distance to whom that town owes whatever is done to keep up its individuality. This should not be. It is not Scottish types alone that are worth preserving, and lovers of art all over England should each in his place, do all he can to retain what gives that place its architectural individuality.

#### COMMON SENSE IN ARCHITECTURE.

RUSKIN, in one of his essays, very aptly remarks that in these days we are always "trying to separate labour and thought. We want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative." And the consequence of this division is that we dissociate the two: one envies, the other despises, and society is made up of "morbid thinkers and miserable workers." It is in this sense that so much of the architect's work nowadays falls infinitely short of what it ought to and might be. The thinking is done mainly by the principal; the assistant draughtsman performs the labour to complete the design, the result is that one important quality is missed between the two, and that is common sense in details. The workman does not supply the deficiency, for it is not his business to think.

One of the things which architects are most in danger of losing sight of is utility, or fitness. The engineer regards it as the one and only object, the means and end of all he does, even to the extent of grossly offending our nicer perceptions of good taste, and of placing before us in the crudest and roughest fashion, what he thinks to be the outcome of practical common sense, but which is really a very clumsy and awkward embodiment of that quality. But with the

architect the fault is the other way. He is all indecision; in his endeavour to be polite and urbane he falls into abject mannerism, or weakness, often losing sight altogether of those sterner qualities which should be at the very foundation of his design. He deals with styles and conventions which conceal the truth; people admire his work because the naked construction is hidden or disguised under a garment. His very art is to conceal art, to disguise the bare utilities of design, and to make them deferential to our ideas of politeness and good taste. And this endeavour frequently blinds the architect. It leads him to disregard common principles and common-sense, to step beyond the limits of decorum, and become absolutely dishonest. It is one thing to wrap up a bare necessity or fact so as to present it in the least offensive manner, and quite another to ignore it altogether or make it contrary to our notion of fitness. The traditions of a century or more of wrong art teaching have discounted the value of common sense in our architecture and design. It has been our habit of thinking common sense and utility commonplace and derogatory, and, in fact, contrary to art. An ordinary plain, matter-of-fact building has been looked upon as only worthy of the builder, with which the architect has nothing to do. In fact, it has been the relief of modern times of *fin de siècle* society that the artist is out of sympathy with the working world. Everybody regards him, and he regards himself, as a personage superior or above the utilitarian wants of the day. With such ideas so firmly grafted in the minds of these professors of art, we cannot be surprised to find the qualities of use and common sense looked upon with a feeling of disregard or disdain, as something beneath their notice. Pseudo-Classicism and Mediaevalism were early developments of this feeling. The Classicist made his roofs flat, or concealed them, just as he did his chimneys; and the pseudo-Gothicist seemed to delight in contradicting common sense, and making his designs for villas and furniture ridiculous. Though we now repudiate these extravagances, and boast of having re-asserted fitness and common sense in our buildings, we yet find much that is contrary to them. The most obvious ideas of fitness are set aside when the architect has a style he wishes to follow. Like the early revivalists of Gothic, the disciples of "Queen Anne" and of modern Renaissance are blind to the dictates of utility. They seem incapable of seeing that it is ridiculous to adopt a façade, say, in the Francis I. style for a warehouse or shop in the City, or a Venetian doorway or window to a building destined for the most ordinary commercial or official occupation. What may be suitable in the court of the Louvre would be a caricature in Fenchurch or Leadenhall-streets, just as it would be a sheer burlesque to build a villa in a London suburb in the style of elaboration of the Château de Chambord. But want of common sense in architecture does not stop at misappropriation of style to façades. In every-day structural matters we see the same ignoring of fitness, as in the internal fitting and appointments of banks and insurance offices, restaurants, &c., where elaborate and highly ornamental joinery and leaded glazing are put in lobbies and vestibules, and where the plainest and dullest surfaces of plaster do duty in places where suitable decoration ought to be. Wrong and unsuitable materials are used for floors and walls, heat and cold-conducting substances like tiles and terracotta where we ought to have wood to preserve warmth and comfort, iron where stone would be better, and so on. But it is all to no purpose, when Art for Art's sake is ignored—when architects must live on commissions, and sacrifice truth for falsehood. Even mechanical skill can be counterfeited.

Is it not a falsification of true architectural principles to make the front of a building stand on the ground-floor story, and carry the wall by a concealed iron girder, so as to make the shop or lower story larger than it otherwise would be? If not, then we must admit that cunning and artifice are qualifications. If it is not wrong to hide the support of a front or back wall so as to get a larger shop or office below, there seems to be little that we cannot do in the way of disguising construction. But it appears to us that common sense and fitness would obviate such a counterfeit as the last. Would the shop or office not be better if the upper wall was carried on an arcade or a visible beam with columns, forming a pleasant break in the room? Honesty is not only the better policy, but it is also most in accord with fitness and common sense. The most direct and obvious way of doing a thing is generally the best. A cunning piece of construction which is intended to hide the means used must not be confounded with common sense. The engineer thinks so when he covers his steel or iron framework with stonemasonry to mimic a Tudor tower; but time or fire often teach him the contrary. We wonder where our great cathedral churches would have been had the engineer, with his iron and steel construction, had a free hand in their erection? It would lead us too far to inquire how fitness and common sense have been transgressed in the choice and combination of materials.

We occasionally meet with the most painful and unfortunate arrangements and juxtapositions of materials which a little thought would have avoided—such as iron in connection with stone or terracotta, brick and timber in situations which must be destructive to the latter; but we wish to draw attention to the want of fitness in certain details. In these we read almost a satire on our modern design. Take, for example, the material and the treatment of the basements and plinths of buildings. Ancient and modern architects of the great epochs always took particular care to make the lower stories of their buildings plain, and to build them of durable materials, and they never attempted to do such a silly thing as to put the softer material where it would be most exposed to decay or rough usage, or to place delicate ornamentation in positions where it would be easily destroyed or mutilated. Imagine what they would have thought of using soft or porous stone or brick in the plinth of a building close to a public street when they could have employed a hard stone or an impervious brick. What would they have thought of making a plinth of porous white stone round a meat market like that at Smithfield, which plinth is begrimed with grease and dirt from the smocks of butchers and salesmen, when a hard granite or a hard glazed brick could have been substituted? A white limestone or sandstone is in such a situation a grievous mistake, as anyone may see who looks at the first dozen buildings which are close to a foot-pavement in any of our city streets. And then, too, the treatment. Our old buildings—the works erected by Inigo Jones, Wren, and the early revivalists—have all massive and plain basements; some quite plain, others rusticated. All superfluous breaks and recesses are avoided, and the mouldings of plinth are of bold contour. If there is a balustrade, it is solidly treated; sometimes it is made square in plan, the mouldings have a massive astragal and inverted ogee, and the plinth is solid and high. The modern building often transgresses; the plinth is low, and of small projection—a mean-looking skirting, the mouldings are full of small and ill-designed members; often the lower ones project, much to the inconvenience of those who have to pass the building, and they form a receptacle for soot



and dirt, or the lodgment of rain-water. If of soft stone they get chipped or broken, or they become a convenient step or ledge to be climbed on. The lack of common sense is very painfully apparent in the choice and design of mouldings. Those in the lower part of buildings ought to obey at least certain well-defined rules. First, they should not project beyond the plane of the plinth. Examples of the violation of this rule are often seen. In a recent Late Gothic building in Arundel-street the plinth mouldings of the usual "wave" type project beyond the brick plinth, and obtrude awkwardly, and some brick entrance-piers have projecting stone cornices just sufficiently high to come in contact with the heads and shoulders of pedestrians in the footway, besides which they are liable to be broken off. Secondly, the profile ought to be as bold and flat as possible. Any small or deeply-cut mouldings are soon injured or destroyed. They ought to be so designed as not to make a foothold, and to easily throw off the water. We might almost imagine the architect did his best to show how elaborately he could make these mouldings, or how vexatious to the passer-by, and many of the new buildings that have been carried out exhibit a pitiable perversion of common sense in dealing with such things as basements, pilasters, carved work, shop-fronts, and the decorative capabilities of our materials.

#### THE SOANE AND INSTITUTE PRIZE DRAWINGS.

THE subject proposed for the Soane Medallion and £100 was this time a design for an Institute of Architects on a plot of land 100ft. by 60ft., having one main and one side frontage at the corner. On the whole, the response to the Institute's invitation is not remarkable for any great achievement in design. Two or three clever sets of drawings are exhibited on the screen in the meeting-room. "Ad Finem" (R. Sheckleton Balfour, who is awarded the first prize) is in an Italian Renaissance style; it has a central pediment and columnar treatment in stone. The entrance is scarcely wide or important enough; but there are good points in plan. In the left wing is the exhibition gallery, and the clerk and secretary's offices to the right of entrance. The library is placed along the front on first floor, the meeting-room on the left side, and the council-room on the right or return side. The principal stairs, retiring-rooms, and lavatories are conveniently placed. A well-drawn design, which takes the second prize, bears the motto "Thor" (by John Anderson, Haverstock Hill), Italian Renaissance in style, freely handled in the fenestration and principal story, which is surmounted by a bold cornice. The principal floor windows are somewhat lofty and narrow, rusticated, with niches for figures between. The plan is well thought out; there is a good hall and vestibule in centre of main front, the secretary is located on the left side, and the library is on the return side. On the first floor the council-chamber is in the centre, with dining-room on left, and meeting-room fronting the return side. The elevations and details are drawn with delicacy and grace. We shall illustrate this design. "Bow Bells," by E. A. Rickards (third prize), is boldly-conceived, broad, massive and dignified, though somewhat severe. The long façade is Florentine in treatment, of plain red brickwork, with massive stone hollowed quoins at the corners, and its main relief on the upper and main floor is a recessed order of columns with windows between, lighting the meeting room. The lower story is of stone, plain and massive. The ground-floor plan has the waiting and retiring rooms at the side of main entrance, clerk's and secretary's office to the right, the council-

room and dining-room being placed on the left of entrance. Above, a mezzanine floor contains the committee and editor's rooms in front, book-store, and council room. The first floor has the gallery to the left, and the library to the right, facing side street, and the meeting room, made the central apartment, lighted in front. The staircase-landing in the rear is spacious. "Red Thistle" has also merit both of plan and exterior. Of florid Late Gothic character, the author exhibits knowledge of detail and firm, decided drawing in his work. A masterly ink perspective and elevations are exhibited on the staircase, but the plans are hung too high to examine them. One feature of the design is a large octagonal stair turret which makes a bold projection at the corner of the two façades, and gives access from ground floor to the upper story. There is a wide entrance-hall, with main stairs on one side of it. The council-room is at the left, with secretary and clerks' offices on the right. The meeting-room is over the council-room, and the library on the return side. The planning exhibits architectural arrangement, and the council-room and meeting-room are accentuated by a square corner bay at the end of main front. The galleries for drawings are placed along the front on second floor, lighted by a series of windows, and the elevation is surmounted by a high roof, broken by dormers, which light the residential rooms. A cart entrance is shown in rear on the plan.

A cleverly-drawn but unsuitable design in a sort of Oriental or Byzantine style has the motto "Fleur de Lis." The author is an expert draughtsman, and his façade puts one in mind of the front of St. Mark, Venice. The delicately-drawn detail evinces artistic skill. The main story has a blind arcade of engaged shafts of green Irish marble, carrying arches and spandrels of marble, inclosing three-light windows with heads of Saracenic type. A pierced balcony cuts off the ground from first floor. The upper story is plain, except the centre, which is enriched with windows. A large circular tower, corbelled out at corner of block, is shown crowned by a conical roof, and there is a dome and roof of copper. The author proposes Portland stone of a cream colour, with Irish marbles in columns and spandrels, and white marble figures representing the arts and crafts adorn the upper part of façade. The ground plan has a large central hall of elongated hexagonal shape, the library being on the left side, and the secretary, &c., on the right. Above are council-chamber, meeting-hall, and dining-room, beginning from the left side. "Green Dragon" is original, broadly treated, though rather heavy in its details, and the plan has some merit. A separate entrance to secretary's office is shown on the left side. There are 17 designs sent in.

The Tite prize, awarded for the best design for a stone bridge across a river 725ft. wide, has not called out any conspicuous talent. Perhaps those with mottoes "Pons Asinorum," "Red Star," "Australis," "Calypso," "From Bank to Bank" are amongst the best. "Australis" (H. H. Crouch) wins the prize for a simple and dignified structure of seven elliptical arches. "Pons Asinorum" is ambitious, with archways and equestrian groups of sculpture. "Red Star" has merit, the centre span being emphasised by the piers. Ten designs are sent in.

The Grissell prize for a polygonal or circular band-stand of wood and iron, 30ft. diameter, with domical roof, has been competed for by nine candidates. "Zampa," (J. H. Tonge) receives the prize for a clever design in wood and iron of elaborate detail. "Pan" is a pleasing and artistic design, with a Chinese feeling in its outline. The ogee dome is surmounted by a group of figures representing Pan and his huntsmen, and the antefixæ are also winged boys with pipes over

the eight pillars. "Orpheus" is simple and domical, and "Japan" has a pagoda-shaped roof.

For the Pugin studentship this year only six candidates have contributed, and these send drawings and sketches—chiefly the latter, Continental and English examples. C. C. Brewer receives the only prize for several interesting pencil and coloured sketches, including St. David's Cathedral and details, sketches from France. J. H. Swan sends a drawing of the Skippers' House, Ghent, an elaborate Late Gothic gabled front, and sketches from Belgium. E. Rickards sends some sketches of Magdalen College, Oxford—the hall and cloister quadrangle—in ink and pencil.

The Institute Silver Medal is given to "Gulielmus" (H. P. G. Maule) for a set of measured drawings of Hampton Court Palace, carefully drawn. The second prize is given to "X." (Mr. Cyril Smith) for measured drawings of Gedney Church, Lincolnshire, an interesting edifice. Only four sets are exhibited, and these include a carefully measured plan and drawings of the Charterhouse, under a coat of arms. The Owen Jones studentship is awarded to H. C. Corlette for some very beautifully-coloured decoration from St. Anastasia, Verona. H. S. East also sends some very interesting colour decoration from Venice and Florence.

#### CONCERT HALLS AND ASSEMBLY ROOMS.—IX.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE drill-hall assumes at times the character of a concert-hall or assembly-room, although it is not always the most fitting place for such a purpose, and as it is built primarily for a drill-shed, its shape is often not the best for a seated audience. Many drill-halls are nearly square on plan—they are much wider in proportion to their length than rooms built exclusively for public entertainment, while others, as in the case of the drill-shed of the Honourable Artillery Company, are very long in proportion to their width. There is not the same reason for strict rules of shape and proportion in a drill-hall, where only drilling and gymnastics take place, as in a room used for music or speaking, where proportion and acoustics play so important a part.

Referring to the shape of a hall for public speaking or music, the length, width, and height must, of course, be greatly governed by local conditions; but the length should be considerably greater in measurement than the width. The height depends upon the shape of the ceiling. As a general rule, a writer says, for measuring the proportions, one can take the height of the hall to be equal to from two-thirds to three-quarters the width, or half of the diagonal of the length and breadth of a rectangular room. Fergusson gives that the height should be half the breadth plus the  $\frac{1}{4}$  of the length. In order to increase the height of a hall, the floor may be made lower by a few steps than the surrounding rooms, by which means a pleasing outlook over the hall and dancers is acquired. One can also improve the appearance of a room where height is actually deficient by emphasising the vertical lines, either by pilasters or in colour decoration, and making the horizontal lines subordinate. On the other hand, a room which appears too high can be made to look lower by accentuating the horizontal lines, and omitting as many vertical lines as possible. The pilasters and columns in Willis's Rooms show an example of a method adopted to make the room look lofty.

The entrance to a hall is much better when at one of the short ends, than when in the middle of the long side. The first impression of length is much more impressive and imposing—and it is the first impression which is the most lasting.

The drill-hall has other disadvantages besides that of shape. The floor is often laid as a wood-block floor, which is not suitable for dances. Even when formed as a close-boarded floor its surface becomes so rough with the marching and drilling of the men, that it is quite unfit for dancing. At the drill-shed of the Honourable Artillery Company, when dances are given, a false polished parquet floor is laid over the other floor. This false floor is made in sections, to be laid down



quickly; but each section fits perfectly into the other, providing an even surface for dancing upon.

The buildings in which drill-halls are incorporated are, on account of being the headquarters of a corps, frequently arranged upon the lines of a club, and it is therefore we find, as in the case of the headquarters at Finsbury of the Honourable Artillery Company a fine hall or dining-room on the first floor. These premises are no doubt exceptional, containing, as they do, accommodation for every kind of active recreation, besides reading-rooms, billiard-room, smoking-room, dressing-rooms, harness-rooms, &c.

The illustrations to this chapter have been supplied me by Mr. Shoppee, the architect of one of the best drill-halls in London, the St. George's Rifles Drill-hall and Headquarters. Complete plans and sections of the building have been specially prepared from Mr. Shoppee's own drawings to accompany this article.

It should be understood that this hall was built first as a drill hall, and that afterwards it was occasionally used as an assembly-room, and also that it is a room licensed for music and dancing.

The hall itself is situated on the ground floor, a few steps above the street level. There is a broad entrance in the centre of the front façade, on one side of the entrance is the officers' room, while the colonel and secretary's private apartments are situated on the other. By the side of these rooms is a staircase leading down to the basement and up to the two floors above.

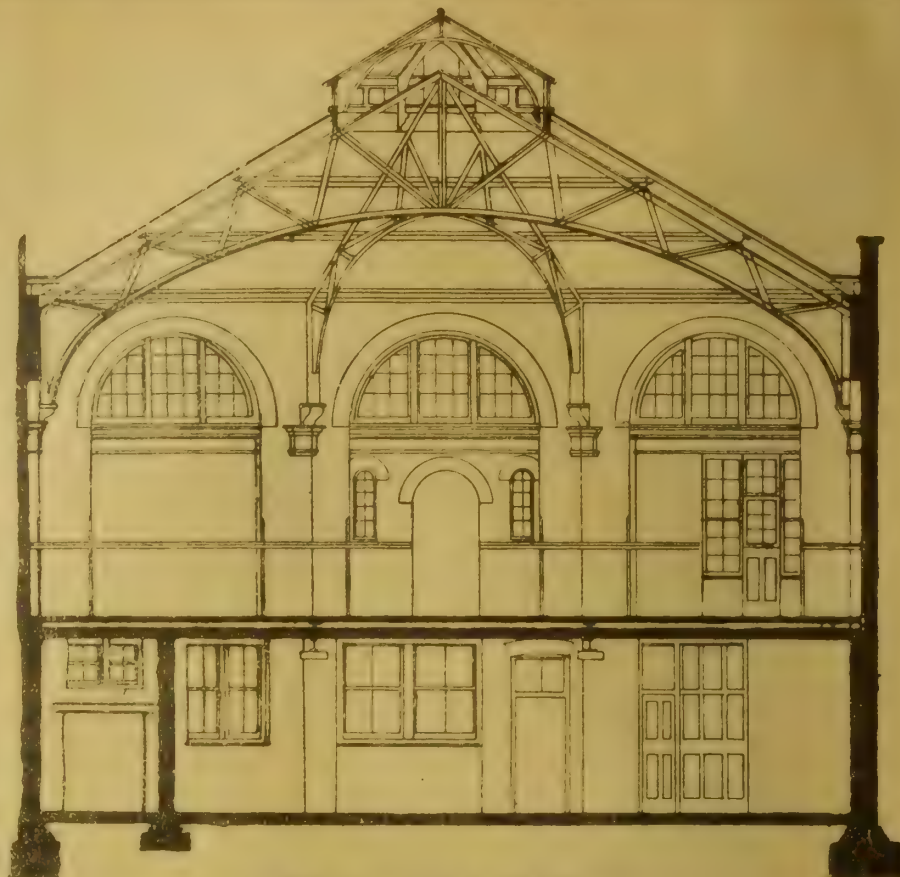
The hall itself is over 80ft. long by 58ft. wide and 40ft. high to the apex of the roof, 22ft. to the wall-plate. The size and shape of the room admirably adapts it for the purpose for which it was principally designed—that is, for the purposes of a drill-hall. At the extreme end of the hall is an extra exit, leading directly into the back street; near this exit is the armoury. In the basement one finds a large space devoted to the school of arms, the Morris tube gallery, and the volunteer stores. The front part of the basement is arranged as a canteen for the men, with a billiard room attached. There is a lift from the canteen to the kitchen on the second floor, which allows for the quick service of refreshments. The lavatory accommodation for the men is also situated at this level, there being lavatories both in the front portion near the canteen, and in the back portion near the school-of-arms, the latter, in addition to the wash-basins, &c., being provided with a bath. The orderly room near the staircase completes the arrangement of the basement.

The front part of the building is carried up two stories. The whole of the first floor is occupied by a large recreation-room, out of which a small gallery can be reached which overlooks one end of the hall. The recreation-room is connected with the kitchen above by the same lift, which serves the canteen in the basement. On the second floor is an officer's dressing room, with lavatories, a library, and a kitchen, while the attics are used as the living-quarters of the caretaker.

It will be seen that a building arranged for these purposes, and in this manner, can be adapted to the purposes of a public assembly hall. When occupied in this manner, the hall is provided with rows of chairs battened together in lengths of sixes, in order to comply with the regulations of the Council. The doors are fitted with automatic bolts, exit notices are displayed on the walls, the gas-burners are fitted with secret taps, and oil-lamps are burnt as a second system of lighting. By this means a building which has been erected as volunteers' headquarters, has been made to comply sufficiently with the regulations of the London County Council, to enable the authorities to issue a certificate of safety, and a license has been obtained to use the building as a concert-hall and an assembly room.

The fact that the hall is practically on the street level, and has exits both back and front into public thoroughfares which the audience can reach without traversing any passage, corridor, or staircase, makes these premises particularly suitable for public assemblies.

It may be thought strange to assert that there is less danger from fire and panic in a building of this class than in many other structures which it has been my duty to describe in this series of articles. The reason for this diminution of risk arises from the fact that these buildings are maintained under military discipline, the persons in charge being trained to watchfulness and prompt action. After all, in spite of every provision



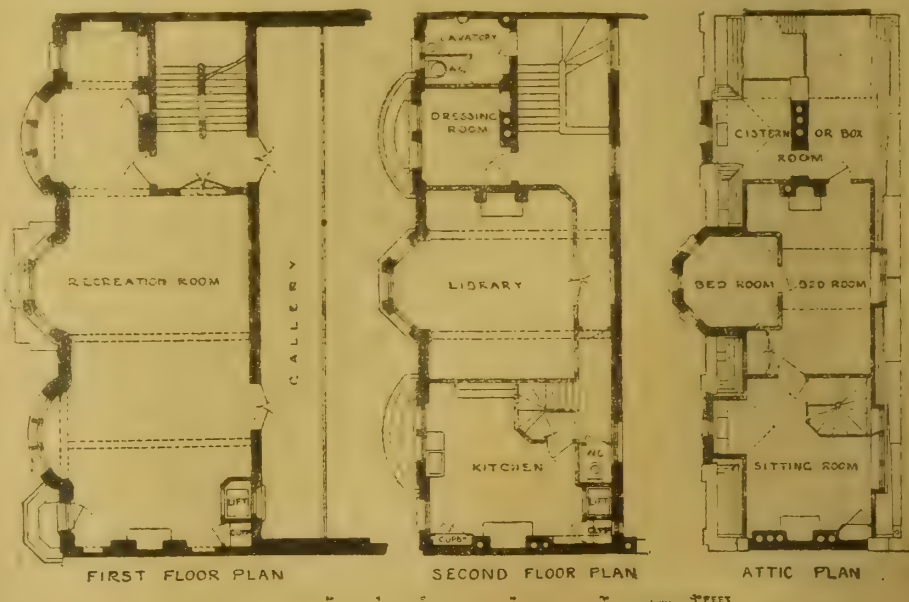
CROSS SECTION

0 10 20 30 40 FEET

being made by the architect in the planning and construction of a building, much more depends upon the fire-watch than the proprietors of places of this sort are willing to acknowledge. It is seldom that one finds a properly organised fire-watch in the minor class of assembly rooms to which I have had to refer. It is true that in the last revision by the Council of their regulations they

the special ability to command obedience, that those who have received a military training are particularly fitted to have charge of premises in which the public assemble in great numbers.

While speaking of fire appliances and the fire-watch, requisite for the small assembly-room, it will not be out of place to remember that provision must be made for special care where



inserted a rule that every hall having a superficial area of 1,000ft. or more should be provided with a fire hydrant connected with the high-pressure water main, and of a pattern and size to allow fittings to be used of the same description as those employed by the Metropolitan Fire Brigade.

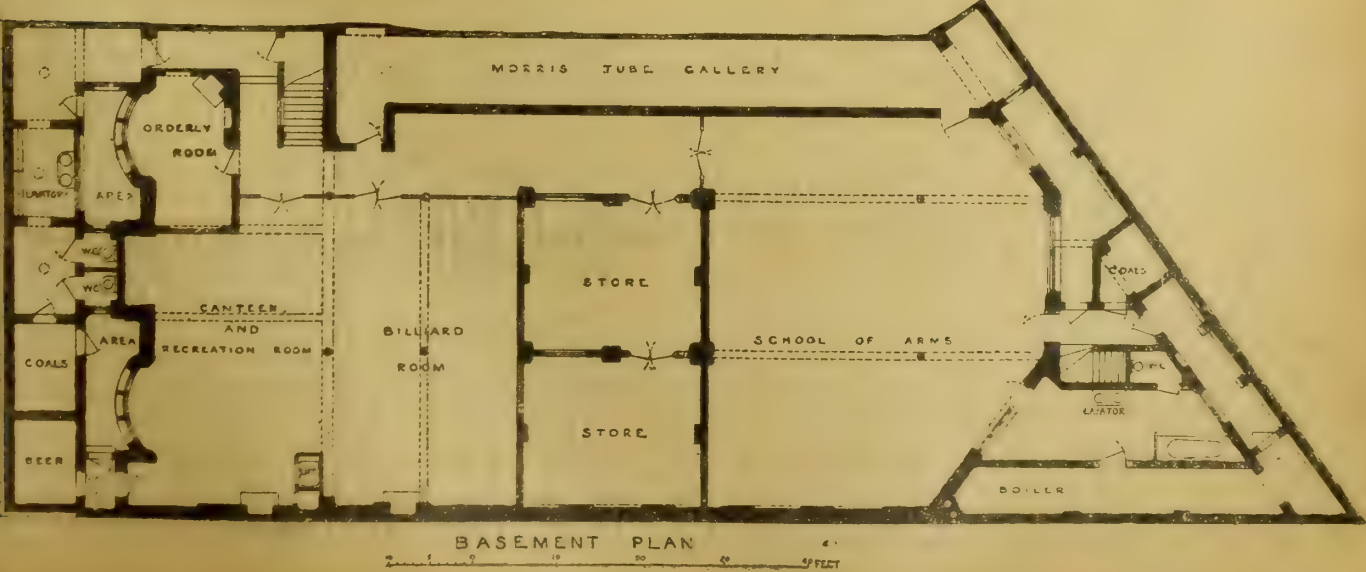
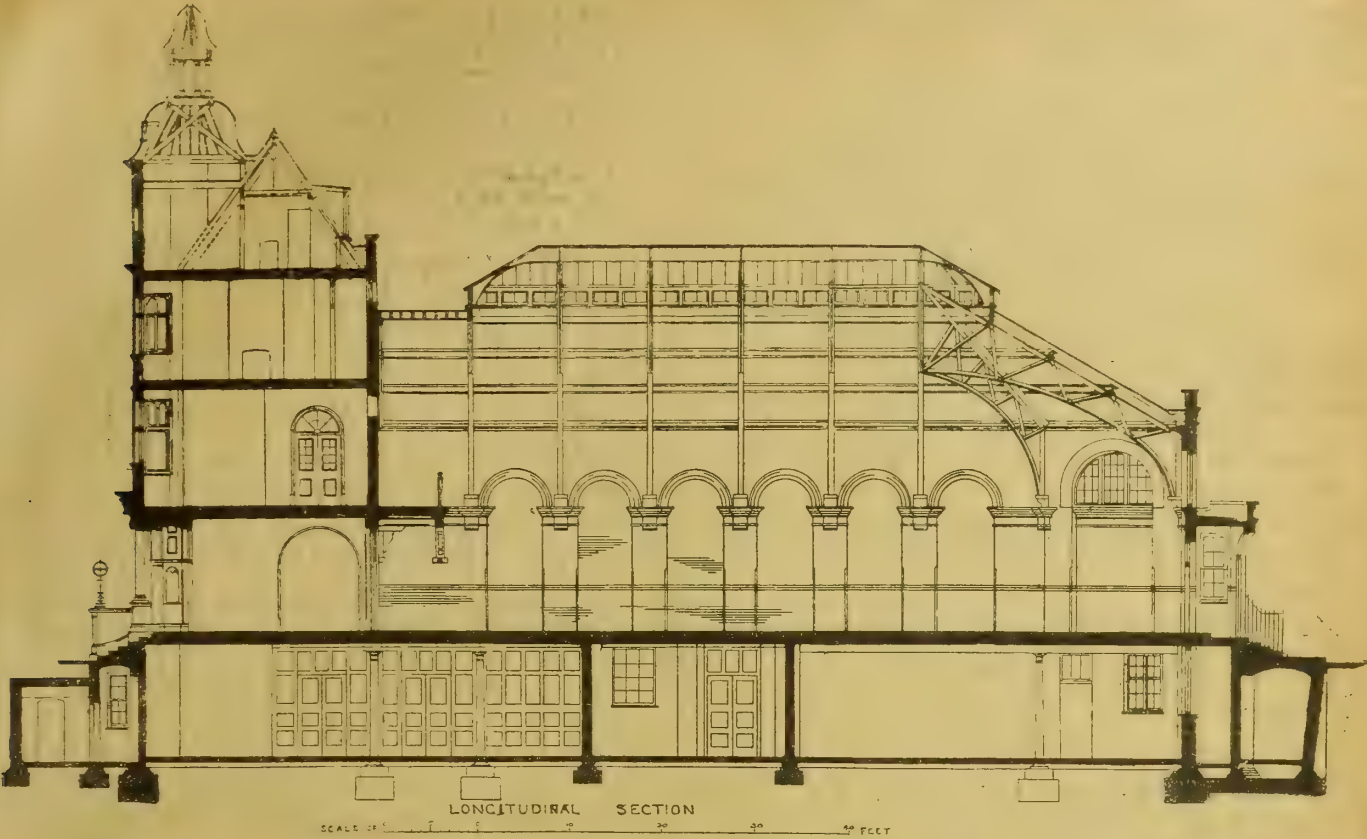
In halls of a smaller superficial area, corridor fire-engines and buckets are allowed, the prompt use of which is as efficacious on the first outbreak of fire as a subsequent employment of a hydrant. It is in the use of these appliances, as well as in

temporary stages are erected for theatrical performances.

I have already described in a former chapter the character and light construction of these stages, their great inflammability, and the special fire risks which attend them. Fire-buckets full of water, with a small bucket-pump and wet blankets, should always be placed upon the stage for ready use; buckets and blankets should also be found in the dressing-rooms.

There are a few remarks with regard to gas







arrangements which I should like to make before I conclude my description of these minor assembly-rooms and pass to the consideration of those of the larger class.

It is well always to place the gas-brackets, both in the hall and its approaches, out of reach of the audience under any circumstances. They should be provided with secret taps, so that they can only be turned out by the attendant who has the key. In the rooms which, when performances are given, will be used as dressing-rooms, it must be remembered that the amateurs will require as much light to make up by as the professional in the dressing-room of a theatre. It is as dangerous to use candles or lamps in rooms of this kind as it is in a theatre, and unless proper gas-brackets are provided, and the points placed where required, the risk is that the thoughtless amateur will provide his own light, and then the danger becomes very great indeed.

#### ARCHITECTURAL ASSOCIATION.

THE fifth fortnightly meeting of the Architectural Association was held on Friday evening, Mr. W. D. Caröe, F.S.A., the President, occupying the chair. Messrs. H. Badcock, B.A., H. Brown, P. A. Hartland, E. Lacey, J. Heath, and Welshman were elected as members.

#### MUNICIPAL BUILDINGS.

Mr. HENRY T. HARE, A.R.I.B.A., then read a paper on this subject, illustrated by numerous plans by himself and other architects. In his preliminary remarks the author observed that, in mentioning a few points in connection with the designing of modern municipal buildings, he claimed no expert knowledge or authority on the subject. He had, however, taken much interest in that class of buildings, and had given some little attention and study to them, and, as a natural result, certain considerations had presented themselves to him as desirable or essential. There is, continued Mr. Hare, probably no class of building in which the problem submitted to an architect is more complex or difficult of satisfactory solution than that of providing a suitable home for the municipal life of a large city. The multiplicity of departments, each of which must be in a position readily accessible, and all of which must be, to some extent, within touch of each other, the varied requirements of lighting, difficulties of site, &c., coupled with the necessity for the whole to be capable of artistic and dignified architectural treatment, render the subject at once the most difficult, and therefore the most attractive, that an architect can be called upon to devote his attention to. The conditions under which these buildings are dealt with here in England are generally very different from those which obtain in Continental countries, where a large area is usually treated as a whole, and the principal building is placed in a central and commanding position, on a site open all round for light and air, and lending itself to architectural treatment from all points of view. The usual conditions under which English architects work are those associated with a cramped and irregular site, possibly built in on two or three sides by adjoining property, with dominant ancient lights to be respected, and the accommodation required generally rather more than can be conveniently arranged on the ground, or provided for the amount proposed to be expended. Now, while this enormously increases the study and thought required for a satisfactory solution, I am far from regarding it as an unmixed evil, and the interesting character of many of our buildings supports this view. An irregular and difficult site in most cases suggests a motive or *point d'appui*, which is extremely valuable in initiating the plan of a building, and the difficulties which have to be overcome in the working out of the smaller details of the plan may always lead to interesting and artistic developments; the treatment of an acute or obtuse angle, or a considerable fall in the ground, contains latent possibilities which may be invaluable. An open and practically unlimited site tends to produce a mechanical and uninteresting building, for the reason that it does not call forth and excite the same effort as when there are serious difficulties to be overcome. I am not, however, entirely satisfied with the present conditions. On the contrary, there are too many instances in which those schemes are approached in a purely commercial and utilitarian spirit, disregarding any considerations beyond those of providing the necessary accommodation for the lowest possible

expenditure. Many of our towns, especially those in manufacturing districts, are a mere jumble or conglomeration of houses thrown together, as it were, by chance, without any governing idea, without any thought of beauty or any consideration beyond that of absolute utility. When, therefore, it becomes necessary or desirable to provide buildings for the transaction of public business, an opportunity offers of raising the whole character of the town, of providing a centre or focus round which all that is best shall be gathered, and a building which shall tend to promote the appreciation of the beautiful by the people, and shall be a source of pleasure and pride to succeeding generations. Realising this, it becomes essential that such a scheme should be inaugurated in no narrow or parsimonious spirit, confining the expenditure, as is often the case, to a sum barely sufficient to build four walls and a roof. The far-reaching effects on the intellectual and moral condition of the people of the contemplation of beautiful and artistic objects cannot be over-estimated, and money expended for such purposes should be regarded as quite as well spent as for such practical matters as sanitation, &c. This appears to be becoming more clearly realised by the general public year by year, but education in this direction must still be regarded as only in the elementary stage. The general character of the accommodation required in modern municipal buildings may be summarised as follows:—1. Offices for the various officials and their clerks, usually placed on the ground and first floors. 2. Council chamber, mayor's parlour, and committee rooms, generally on the first or principal floor. 3. Police department, cells, court-room, &c., on the ground and first floors, and sometimes partially in the basement. 4. A public hall on the ground or first floor, according to the special conditions of the site. Other requirements are sometimes added; but these constitute those most generally demanded. Dealing first with Section 1, the accommodation for officials and clerks, these usually consist of departments for rates and borough accountant, borough surveyor, medical officer and nuisance inspector, water and gas works, and the town clerk. It is essential that all these should be very readily accessible to the public, and with this in view all except the offices allotted to the town clerk are usually placed on the ground floor if the area of the site permits. The town clerk, requiring to be in touch with the mayor's parlour and committee-rooms, is generally placed on the first floor; but is it desirable that his clerks' or inquiry office should immediately adjoin the head of the public staircase? The chief desideratum to be borne in mind in planning these offices is compactness, and the reduction to an absolute minimum of the length of public corridor required. In most instances some public corridor is essential, and in these cases it should be wide—not less than 8ft. or 10ft.—and well and directly lighted. The clerks' and inquiry offices should be in the most prominent and noticeable positions, the private offices being rather more retired, and entered through the clerks' offices, as well as provided with a door from the corridor for private use. One point in regard to the designing of corridors appears to me to be worthy of consideration. In cases where the height of the offices is from 12ft. to 14ft., in the ordinary course the corridor adjoining would be of the same height. Now, this for a corridor, perhaps 8ft. wide, gives a very unsatisfactory proportion, and one which can without difficulty be corrected if trouble be taken to do so. One means of doing this is by introducing a vaulted ceiling, which at once reduces the apparent height. Another way is to introduce a flat false ceiling at a height of 9ft. or 10ft., in which case the space between the ceiling and floor above may be utilised for pipes or electric wires, or for ventilation with advantage, providing some means of access is arranged, which should not present much difficulty. The whole of this section of the building should be self-contained and capable of being shut off entirely from the public portions. The council chamber should be in a quiet position, and the mayor's parlour adjoining and communicating with the private office of the town clerk. The access for the public to the gallery of the council chamber should be by an entirely separate entrance and staircase from the street, and should be as direct as possible. In most cases a gallery to accommodate from 25 to 30 persons will be sufficient, as very few people attend the ordinary meetings of a town council. The size of the council chamber will be entirely governed by the number of members of the council, it being

desirable to keep this room as small as possible consistent with comfortable and adequate seating space. In arranging the plan it is important that the disposition of the seating should be first decided on, as this will, or should, to a great extent regulate its shape. The general considerations to be borne in mind are:—(1) That the whole body of members should be as much as possible concentrated, and not scattered about; (2) that each member should have the large majority of the whole in front of him, and consequently it is never desirable to have more than two rows or tiers of benches; (3) that all members should be able to leave or enter the chamber with a minimum of disturbance, and without crossing between a speaker and the chairman. There are several possible arrangements of the seating, each of which has its advantages in certain cases. For small numbers, say 24 to 36, the ordinary disposition of parallel rows in the direction of the length of the room and facing each other, one end being closed by a semi-circle of seats, and the other end by the chairman's seat, is possibly the best that can be adopted. For larger numbers, it becomes necessary to make other provisions, one of the most favoured being a semi-circular arrangement of seats, the chairman occupying a position on the chord of the arc, and the officials being in the central arena. If it is desired to adopt this disposition, the room should be specially planned with this in view, and should, to some extent at least, take the general lines of the seating. The entrances and exits should be on the walls behind the seats, and opposite the gangways, with the exception of a special entrance for the chairman, which may be arranged in the wall behind his seat. This is not, however, an essential provision, but it is convenient where possible, the object being that the chairman may be able to take his seat without necessarily passing through the ante-room. One of the most unsatisfactory arrangements of seating is the very usual one of the semi-circular plan, with the entrances to the room on each side of the chairman's seat, as no member can enter or leave the room without considerable disturbance. When two rows or tiers of benches are introduced, the back row should be raised some 6in. or 7in. above the front row, and the mayor's seat about 12in. above the general floor level. The minimum allowance for seats may be taken as 4ft. from back to back, and 2ft. in width for each member. Every member should be provided with a small locker, desk, or drawer for keeping papers or memoranda, and a continuous foot-rail covered with indiarubber will add much to the comfort of the arrangements, besides protecting the seats from injury. Where space permits, the seating may, with advantage, be placed in pairs on the "dual-desk" principle, in order that every member may be able to leave his place if he desires without passing before other members. In many instances, however, it will be found that by this system the amount of space occupied by the gangways is so great that the size of the room is unduly increased, and, if so, larger numbers will require to be grouped together, but the smaller the number so grouped the greater will be the general convenience. The gangways need not be wider than 1ft. 9in. to 2ft.; but it is advisable that as much space as possible be left in the central arena, as this is the most convenient situation for reporters and officials. There is some diversity of opinion as to the comparative advantages of fixed seats or ordinary movable chairs, the latter being more generally favoured; but there can be no question as to the superiority of fixed seats from an architectural point of view, and if they are provided with arms they may be quite as comfortable as chairs. As previously mentioned, one of the first considerations in the disposition of the council chamber is that of absolute quiet and retirement; and, following up this idea, it appears to be desirable that the lighting should be high up in the walls, the sills of the windows, say, 10ft. or 12ft. above the floor, and the lower portion of the walls lined with panelling. The general proportions of the room should be studied carefully to secure the best acoustical results, though this is, to a great extent, speculative in anything but a simple rectangular apartment. The height should be kept down as much as possible, consistent with architectural proportions. Top-light is never a desirable arrangement—indeed, it may be remarked that, wherever architectural effect is aimed at, top-light should be avoided as far as possible, as a satisfactory treatment of this method is very difficult and unusual. The mayor's parlour



should be arranged with a pleasant aspect, and will be required to serve the dual purpose of a semi-state room, and a general every-day business room. It may be of moderate size, say 20ft. square, and should be treated as a comfortable sitting-room and may have a small private lavatory attached, though this is not essential. The committee-rooms will be governed as to size and shape by the number of members they are designed to accommodate. It is advisable to set out tables and chairs on the plan in order to see that the required number may be comfortably seated. Space should be left in the two corners behind the chairman's seat for a small table for two or three officials. These rooms in ordinary cases should not exceed 12ft. or 14ft. in height. In municipal buildings of considerable size the banqueting-hall will be one of the principal and most architectural rooms. This will be arranged as a part of the council suite, and one of the committee rooms should be so placed that it may serve the purpose of a reception room; that is, where no room is specially set apart for that purpose. Ample kitchen accommodation must be provided, preferably on the top floor, with a small service room adjoining the dining-hall, and having lifts, &c., communicating with the kitchen department. In many cases the banqueting-hall will be required at times for other purposes, and this should be borne in mind in planning for entrances and exits. A small musicians' gallery is a decided addition to the room, besides giving a motive for an interesting architectural feature. No general rule can be formulated as to the position which the police-station should occupy, as this will entirely depend upon the circumstances and nature of the site. It should, however, be away from the main front, and entered if possible from a side street. The accommodation will usually consist of a charge-room, inspector's and superintendent's offices, six or more cells, with waiting-rooms for prisoners, and a court-room, with public waiting-hall, and rooms for witnesses and barristers. The court and its appurtenances are usually placed on the upper floor, the cells being on the lower floor, and so arranged that a small staircase may communicate between the dock and the cell corridor, where provision should be made in the form of seats with high divisions for prisoners awaiting trial. The cell corridor should be entered directly from the charge-room, with which the inspector's and other offices should also communicate. The size of the cells is to a great extent fixed by the Home Office regulations, and the chief considerations to be observed are:—1. Facility for keeping clean. 2. They should be of such shape that the prisoner may be under observation whatever position he may be in. 3. Each cell should be directly lighted from the outside. To meet the first of these requirements the walls should be lined internally with glazed bricks, and the ceiling arched over in the same material, the floor being of asphalt or cement—the former by preference. Some ingenuity is generally required to light the passages adequately, as the cells occupy the whole of the outside wall, thus cutting off the corridor from the light. The police-station and the court should each have an entirely separate and distinct entrance. In small buildings where only two or three departments of offices are to be provided for, it should be possible to so arrange that the public office of each department may open from the entrance-hall direct, and thus avoid all corridor, except such as may be necessary for private inter-communication. This is the ideal arrangement, but it is not possible where there are a number of different departments. The position of the borough surveyor will, in most cases, be determined by the fact that his drawing office should be lighted from the north. This is generally insisted on, though personally I am of opinion that too much importance is attached to it. A direct south light might reasonably be objected to, but an east or west light appears to me to be preferable to a north light, which renders a room very cold and cheerless. The drawing office should be a long narrow room with windows on the long side, and it is desirable that the principal's private office should directly command both this and the clerks' or inquiry office if possible. The town clerk's department will be fixed by the position of the mayor's parlour, which the town clerk's private office should adjoin if it can be arranged, or, if this is not possible, the two rooms should be near enough to each other to render inter-communication easy. Departments should never be split or divided between two or more floors, unless there are

some very special reasons for doing so, as in the case of a laboratory or photographic studio, which must be on the top floor, while the rest of the departments will be placed below. In this case there should be direct access by a private staircase. The remarkable plan submitted by Messrs. Flockton and Gibbs in the competition for the Sheffield Municipal Buildings marked what was practically a new departure in the planning of this class of building, and is worthy of the closest study and attention. The principle here adopted was that of a central hall, with the public office of each department opening directly from it, and surrounded by the private offices of the several officials. This arrangement is undoubtedly ideal, but to adopt it strictly would usually involve increasing the number of stories to an undesirable extent, as was the case in the design in question. The principle is, however, unquestionably the right one, and in planning public offices should always be borne in mind; but it will be necessary to modify and adapt it to suit the special requirements of the site in each particular case. If I may venture to suggest a criticism, the design in question erred in this respect—that it was not adapted to the site. In large buildings it is desirable that there should be a secondary or subsidiary entrance to the offices, in order that it may be possible to use the main entrance on state occasions without interfering with the course of public business. In some cases it might be an advantage to make the secondary entrance the usual office entrance, reserving the main entrance exclusively for state use. The positions of the strong-rooms for the several departments, which are often of considerable size, present at times some difficulty. These should, as a general rule, open out of or communicate with the clerks' offices. In the planning of most large buildings, there are certain spaces where it is a difficult matter to introduce an adequate amount of light, and it should be endeavoured to utilise these spaces for the strong-rooms; otherwise there is no serious objection to their being placed in the basement, if convenient access from the clerks' office is provided. The roofs or floors over should be specially constructed to secure the requisite strength. The thickness of an ordinary fireproof floor is quite inadequate for security. One of the simplest methods of construction is a layer of cement concrete 12in. to 18in. in thickness on steel joists about 3ft. apart, and with a sheet of strong expanded metal embedded in the centre. This forms a practically indestructible floor. As a rule, it is quite unnecessary to line these strong-rooms with sheets of steel in the manner in which bankers' safes are treated, as the chief, if not the only, danger to be guarded against is fire. Some arrangement should be made for inlet and outlet ventilation by small cranked flues in the walls or otherwise. Where it can be conveniently provided, a small museum or show-room for sanitary appliances, &c., will be a valuable addition to the surveyor's or engineer's department. This should be placed in the basement if it can be fairly well lighted and is accessible, as in this position the drainage required can be arranged with the minimum of difficulty. The position and amount of lavatory accommodation should be most carefully considered. In most instances this is very much overdone, as a great amount is not requisite if they are well and centrally placed. Where it can be by any possibility be avoided, they should never be placed on the front wall, as the difficulties of soil-pipes and ventilators are practically insuperable. The council-chamber, committee-rooms, &c., may be regarded as the most important portion of municipal buildings, and it is here that the architect has the greatest opportunity for the exercise of his art. It is here, above all places, that he may with propriety give full play to his ability, and may introduce the richest materials and the most effective design. This being so, it is essential that the planning should be most carefully thought out in its minutest details, as whatever elaboration may be introduced, and however lavish may be the expenditure, the effect will fall short if the planning be ill-considered. On the other hand, the plainest and least expensive materials may be combined into an effective and dignified composition if the plan and details be carefully studied and worked out, and it is in the consideration of the plan that the finest effects are conceived. The main staircase should be treated as practically a part of this section, and should be planned with due regard to the position of the principal rooms, and to that of the main entrance and the offices of the town clerk or any

other officials who may, from the peculiar circumstances of the case, be placed on the upper floor. In buildings where a public hall forms part of the scheme, another factor is introduced in the problem, as the main staircase will be required to serve also as the principal access to that, unless it be placed on the ground floor, which the restricted nature of the site, in many instances, precludes. It would be manifestly impossible to lay down any hard-and-fast rules as to the planning of this department. I can only give in general terms a few of the points which it is desirable to keep in view. The main staircase will, of course, rise from the entrance-hall, and should be of very ample width and easy rise, the minimum of which may be taken as 12in. tread and 5½in. or 6in. riser. The foot of the staircase should be a prominent feature, and seen immediately on entering the building. The head of the staircase should land into an upper hall of as full ample dimensions as the lower entrance-hall. It is here, at the head of the staircase, that the crowding at receptions, and on other important occasions, will be most severely felt, and the more space which can be given the better, both from a practical and an architectural point of view. The position of the cloakrooms for ladies and gentlemen is a matter which is often difficult to determine. In the consideration of these, the manner in which they are generally used must be taken into account. A lady and gentleman enter the building, separate for the purpose of leaving their cloaks, &c., and then rejoin. It appears from this that the two cloakrooms should not be very far apart, and the doors should be almost in sight of each other, otherwise there will be difficulty in ladies and gentlemen rejoining after leaving them. All things considered, the best position appears to be opening out of the lower entrance hall, say one on each side of the foot of the main staircase. The upper hall will then be capable of being used as part of the reception suite, which would not be the case if the cloakrooms were placed upstairs. These rooms are often allowed to take their chance, and are consequently very inconveniently placed. They should, however, be regarded as of considerable importance, and worthy of some care and thought in their arrangement. The upper hall at the head of the staircase should give access to the council chamber department, including banqueting-hall, town hall, and any offices which may be on this floor. In the planning of these rooms, the same principle as that previously advocated of avoiding corridors, or reducing them to a minimum, should be observed. It is always necessary that the council chamber should be provided with an ante or waiting-room of good size, and in most cases it will be possible to so arrange that the mayor's parlour and committee-rooms shall be grouped around it, all more or less entering from it. Where this is done, it will be found that there is great opportunity for architectural treatment, and at the same time considerable economy of space is effected. The ante-room thus becomes available as a waiting-room for deputations to committees as well as to the council, and the whole department is centralised and concentrated. A councillors' lavatory is necessary, opening out of the ante-room, but this may be small, as it will not be in constant use. In buildings where a town hall or public meeting room forms part of the scheme, its position will govern the disposition of the whole plan. The most important consideration in its arrangement is the provision of adequate entrances and exits, and in the planning of these it should be possible to make almost every entrance and staircase in the building available for this purpose if required. It is, unfortunately, usually necessary to introduce a gallery into this room, and this will require the greatest care in its design, and will afford scope for the exercise of considerable ingenuity to arrive at an artistic treatment. The cantilever principle appears to present the fewest objections, as by this means the usually unsightly cast-iron columns may be dispensed with, which is an advantage also from a practical point of view. The projection from the wall should be made as little as possible, and whatever the rise or pitch of the seating, the soffit should be treated quite flat. The construction throughout should be fireproof in all cases, and I would strongly advocate this principle being extended to roofs as well as floors. In many instances the rooms in the roofs are used for the storage of papers and other similar purposes, and there is at least as much danger of fire here as in the lower floors. The construction of the roofs in steel and concrete presents no



difficulties, whatever the pitch required. The extra cost is by no means so heavy as might be imagined, and the solidity and durability of the building are immensely increased. The number of rival systems of fireproofing now in the market are rather bewildering; but the simplest, cheapest, and oldest is the best—that constructed with rolled iron or steel joists from 3ft. to 6ft. apart, with cement concrete filling covering the ironwork above and below at least 1in. This insures an absolutely solid construction with no inaccessible spaces, and forms an immensely strong tie to the building at each floor-level. The same principle can be applied to roofs, but will there be required of less strength and thickness, and can be covered externally with slates or tiles in the ordinary manner. It is probably impossible to construct buildings so as to be absolutely fireproof—that is to say, such as will resist for any length of time the fiercest fire, but if all the constructional parts are non-inflammable, this is all that may be reasonably required. The essential consideration is that time should be afforded to check any fire which may occur in the furniture or goods in the building. One of the most important items in large buildings is the heating and ventilation. Let your building be never so artistic, or costly, or rich, if the heating and ventilation are inadequate, dissatisfaction will result, and this will overshadow all its excellences in other respects. In any building of architectural pretensions, low-pressure hot-water heating appears to be inadmissible, on account of the large size of the pipes required, which form unsightly objects in important rooms. Low-pressure steam is probably the best and most easily-managed medium, requiring smaller and fewer pipes than any others. For large and important rooms I would advocate indirect batteries placed in the basement, with flues communicating with the several apartments to be heated, the air being driven through by fans. All pipes and radiators are thus eliminated from the rooms, there is no interference with fittings or finishings, and there appears no reason why this system should not be completely successful if due care be taken in fixing the positions of inlets and outlets so as to avoid draughts. For the inlets a height of about 8ft. above the floor, and the outlets at the floor level, I have found most successful. The heating surfaces should in all cases be as nearly as possible under the rooms they are to warm. The smaller rooms and offices may be heated by ventilating radiators of ordinary construction. The entire scheme should always be worked out when the drawings are being prepared, and not left, as too often happens, until the building is half completed. This has doubtless been the cause of many of the lamentable failures we hear of. With regard to the architectural design, so much depends upon individual opinion and predilection that very little can be said in general terms. The grouping of the principal front should be more or less symmetrical or balanced, as if a picturesque treatment be adopted a certain amount of dignity is sacrificed, and this element is one of the first essentials. The grouping and arrangement of windows and architectural features in such a manner as to leave ample wall spaces, especially at the ends or corners of the elevation, should be kept in view, as this gives repose and adds much to the effect of the building, besides giving value to whatever features or elaborations may be introduced. The desire to give abundant light to the interior in many cases leads architects to disregard this important point, with the result that the building lacks that appearance of solidity and dignity which should be regarded as all important. I have never experienced a case in which it was not possible to so arrange the windows as to give ample light and wall-space at the same time. In many cases, where the expenditure is limited, the less important elevations are treated in an inferior material to the principal elevation, the latter being in stone and the former in brick. The effect of this, when the two elevations can be seen together, is most disastrous, and I would strongly urge that, when the more expensive material cannot be used throughout, the design of the main front be modified so that the same materials may be used in both elevations. The flank may be simplified in detail, but let the materials carry round of equal quality and character. The building will thereby gain infinitely in dignity and cohesion. I would also urge the necessity of designing all important features in perspective. Towers, turrets, fleches, &c., are most deceptive if designed in elevation



STAIRCASE, PALAIS DE JUSTICE, BRUSSELS.—(From a Photo. by Mr. J. TIMMS.)

only, and the effect in execution may be most disappointing. Allowances for fore-shortening, especially over heavy cornices, are also very important, and in this, too, it is sometimes advisable to make a careful perspective sketch, as there is no general rule that can be applied to all cases. The width of the street and the various possible points of view require to be taken into consideration. I cannot do better, in concluding, than advise all students to examine and study the plans of the most notable of our public buildings, or, perhaps better still, the buildings themselves; to observe how difficulties have been overcome and have been turned to advantage. In applying the information thus gathered to particular sites and conditions, new combinations and fresh ideas and improvements will present themselves. Every plan is more or less a compromise, and though it is rarely possible to meet every requirement, a thorough acquaintance with all the essentials will enable us to judge in which direction modifications may legitimately and advantageously be made.

Mr. E. W. MOUNTFORD, ex-president, in proposing a vote of thanks to Mr. Hare, observed that it was impossible to lay down any general rules for designing a town-hall, the requirements of the boroughs and the views of corporations and their officials being so very varied. The two difficulties which always haunted architects in preparing designs for municipal buildings were that the site was always too small, and the sum allotted only two-thirds of what the group ought to cost. He disagreed with the lecturer's theory that corridors ought always to be reduced to a minimum length; indeed, in council chambers and reception-rooms nothing was more desirable

than that there should be plenty of space on the corridors. The public hall should be almost detached from the main building, and the mayor should be provided not only with a parlour for reception, but also with a small business room.

Mr. A. W. COOKSEY, in seconding the vote of thanks, observed that a central entrance was not necessary, and was often inconvenient. Council chambers should be designed upon acoustic principles, and to this end it was necessary to reduce the entire capacity of the room as much as possible.

The discussion was continued by Mr. STATHAM, Mr. R. LANGTON COLE, and Mr. C. H. BRODIE, and the vote of thanks was heartily accorded to Mr. Hare, who, in reply, urged that in nine cases out of ten it was essential that the entrances should be provided in the main front.

#### CLASSIC DETAILS AND THEIR APPLICATION.\*

By G. A. T. MIDDLETON.

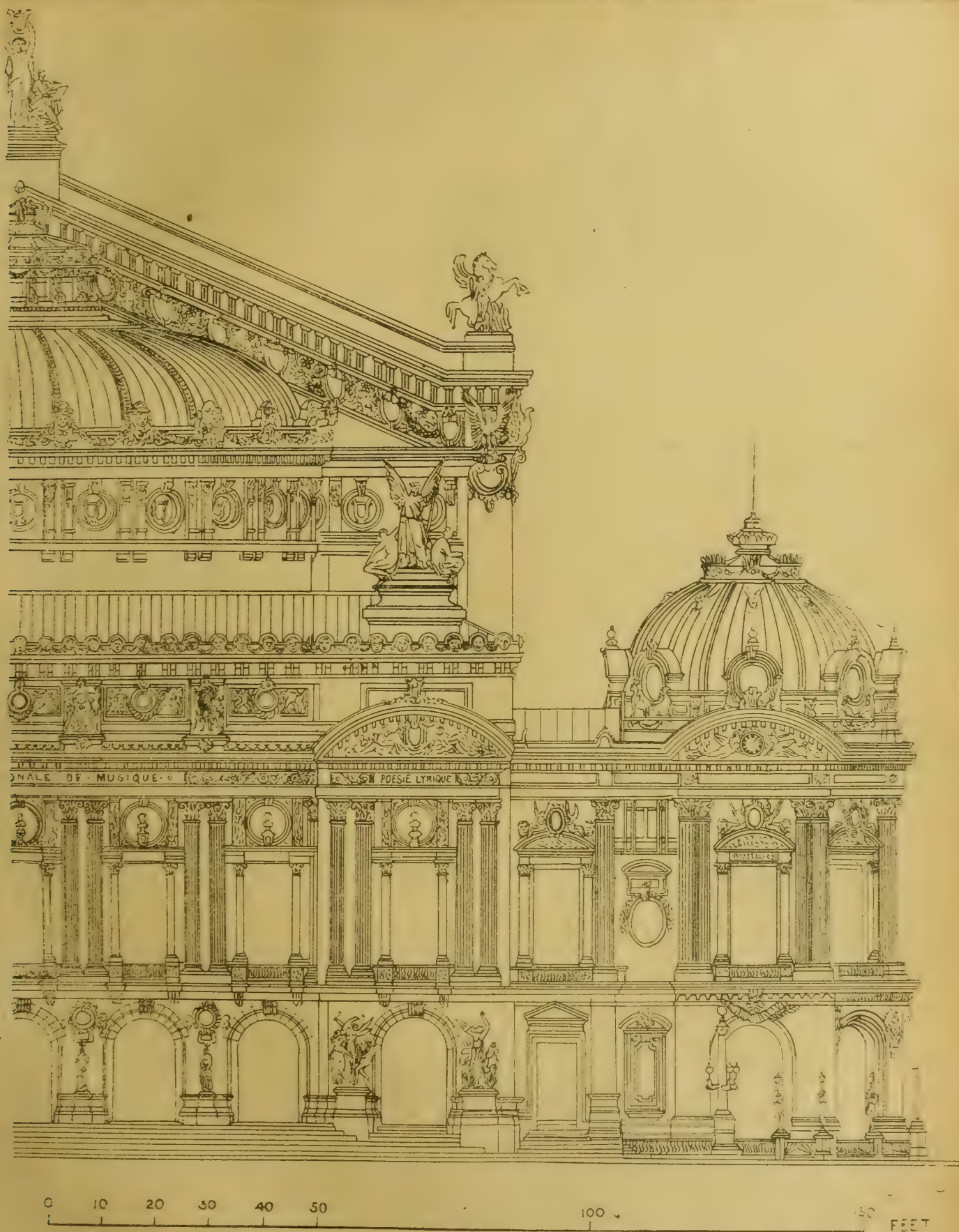
XXIV.—MODERN RENAISSANCE: GREAT CONTINENTAL BUILDINGS.

IT is scarcely too much to say that all Continental architecture is at present dominated by the French Ecole des Beaux-Arts. There alone a completely equipped architectural school exists, and its influence extends, almost of necessity, throughout the countries of the Latin races, and even to the East, where French is the language most in use amongst educated people.

Owing to the peculiar constitution of the

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THE OPERA HOUSE AT PARIS (HALF OF MAIN FRONT).

school, with its recurring competitions leading up to the "Prix de Rome," and the eventual necessary habitation of its most successful students for some few years in the Italian capital for purposes of study there, it has always been devoted to Classic rather than Gothic architecture. With its energies thus concentrated, and with a complete organisation which is calculated to develop its talents of the students to their utmost, there should be great results. Nor is such an expectation altogether disappointed. In the most im-

posing works there is grandeur, freshness, and delicacy, combined in a manner best expressed by the French adjective "*magnifique*," and characterised by considerable originality of treatment upon Classic lines, an axial arrangement and the employment of the Orders being almost universal.

Such a building is the Opera House at Paris, admittedly one of the finest architectural monuments of the century, and enriched with a wealth of detail which renders analysis well-nigh impossible. Statuary and ornamental carving have

been largely brought into requisition, giving an unusually rich and even gorgeous appearance, while yet they are sufficiently subdued to be secondary to the architectural design. The order is impressive and powerful, and—a noticeable though minor detail—the cornices are deep and sufficient, but of very slight comparative projection. Many of the smaller features, such as doors, windows, and lunettes, are by no means pleasing, taken by themselves, calling to mind the later and debased Italian, or the French Rococo; and yet such is





PALAIS DE JUSTICE, BRUSSELS.

the skill with which they are treated, that they harmonise well with the building as a whole, and add the exactly requisite note of richness required by the composition.

Another building, which is worthy of comparison with the Paris Opera House, is the Palais de Justice at Brussels. Standing in a large open space, on the top of a hill, it commands the whole city, and is visible from a great distance, whence the first impression that it conveys is one of noble outline. The second, gained upon nearer approach, is that of a magnificent jumble of huge features gathered promiscuously from all parts of the ancient world, and pieced together just as they happened to come to hand. Closer inspection still shows that neither of these impressions is entirely and wholly true. The general massing, for instance, is by no means so pleasing from the point whence the small accompanying photograph was taken as it is from the King's Park, a mile distant, and again by the time that the outer columns have been passed, and the grand external staircase reached, it is discovered that there is some order and arrangement in the, at first, apparently chaotic details. Still, among the little things there are many which are open to serious criticism. That the architraves are constructed as arches, and not as lintels, is so glaring a piece of false construction that attention is instinctively drawn to it at once; but the want of care manifested in the awkward manner in which the Ionic Order at the landing level dies into the main Doric Order of the external portico is scarcely less noticeable. The heavy banding of both Doric and Ionic capitals at the necking is also more apparent than admirable, though it conforms to the general massiveness of the whole design; but the introduction of both dentils and consoles in the cornice bed is a feature which possesses distinct beauty.

Taken altogether, however, these two buildings may well be considered to be typical of the modern Continental Renaissance at its best and grandest, admirable monuments of high genius and great magnificence restrained by long protracted and strict training.

#### "OLD MASTERS" ON THE CONTINENT. —XXIX.

By CHARLES L. EASTLAKE  
(Keeper of the National Gallery).

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

**A**MID the vicissitudes of public taste to which, as time rolls on, pictorial art is subject, it seems probable that productions of the Dutch school, and especially those devoted to *genre* subjects, will always retain a large circle of admirers. The reason is not far to seek. In the first place, the duration of that school, as compared with many others, was extremely limited in point of time. It sprang into existence, attained its culminating excellence, and practically disappeared, all within a single century. Despite the industry of its practitioners—which in many cases was prodigious—the sum total of their works fell far short of what countries, possessing wider area and more prolonged traditions than Holland, can claim as specimens of native genius. The number of Dutch pictures painted in the 17th century is considerable; but when we remember what Italy had previously produced, and the extent to which later art has flourished elsewhere in Europe, they

must necessarily fill but a small place in the general history of painting. It is, in short, the rarity of *chefs d'œuvre* in this school and the certainty that their characteristic qualities will never be reproduced by any modern brush, which tend to make such works valuable. To this may be added the fact that the delicacy of touch and minute finish attained by such painters as Terborch, Metsu, and Mieris are qualities which commend themselves, not only to the experienced eye, but to a host of amateurs whose æsthetic perceptions may be not otherwise developed. For a due appreciation of designs by Mantegna and Botticelli for instance, some sort of art education is absolutely essential; but anyone can recognise and admire the skill with which Gerard Dow has rendered the texture of a fur coat or the plumage of dead game.

Lastly, the familiar class of subjects which Dutch painters so frequently selected for illustration helps to increase their popularity. Just as modern novel readers outnumber, to a hundred-fold degree, those among their friends and compatriots who derive pleasure from literary works of higher aim, so we may be sure that episodes in domestic life, boudoir scenes, music lessons, the interview of a smart lady with her physician, or that of a humbler housewife with the family poulterer, will always evoke interest from those who may be blind to the merits of more ambitious art.

Among the pupils of Gerard Dow, the name of Pieter van Slingelandt will always be remembered with respect. He did not, indeed, possess that keen perception of character in physiognomy, or the delicate sense of *chiaroscuro*, which distinguish the pictures of Metsu. In realisation of humour and vivacity, he rarely rises to the level of the elder Mieris; but the chromatic quality of his work is often excellent. On objects of still life he bestowed extraordinary care, and in technical manipulation he did not succeed in rivalling his master, it was from no lack of pains. By the light of modern criticism it would be difficult now to mistake a Slingelandt for a Gerard Dow; but it is certain that in former years the mistake was often made. Some idea may be formed of Slingelandt's laborious patience from the fact that he was occupied for three years on his portrait group of the Meerman family—a little picture measuring about 20 in. by 16 in. It is now in the Louvre. Towards the close of his career he could not afford to spend so much time in elaboration, and narrow circumstances accelerated his touch. Several of this painter's works have found their way into English collections: some have been exhibited at Burlington House, and one, representing a Dutch interior, with a peasant woman nursing her child, is in the possession of Her Majesty.

The Royal Gallery at Dresden contains some interesting specimens of Slingelandt's art, one of which, entitled "The Music Lesson Interrupted," has been selected for illustration with this article.

In an apartment enriched with a lofty mantel-piece of oak and marble, a young and comely Dutch lady sits with a pet spaniel on one arm, and raises the other with a deprecating gesture towards her husband, who is teasing the little dog with a flute. The lady wears a blue velvet jacket trimmed with white fur, and a skirt of orange-brown silk partly covered by a muslin apron. These colours are ingeniously repeated in the

embroidered seat of a chair, on which a violin and bow are placed. An open music-book lies on the floor. As is usual in Dutch pictures of this class, a dark background gives relief to the figures, which are natural and life-like in action, while the little dog shows considerable attention to animal form and character.

Another picture by Slingelandt, in the same collection, represents the interior of an old-fashioned Dutch room, in which a pretty girl is seated, while a peasant woman looking in through the window offers a dead fowl for sale. This is an admirable example of the painter, very refined in colour, and finished with great delicacy.

In Smith's Catalogue Raisonné, forty of Slingelandt's works are enumerated. He was born at Leyden in 1640, and did not reach old age, but died at his native town in 1691.

#### CHIPS.

It has been reported to the city council of Birmingham that the commission of £102,000 to be paid to Mr. Mansergh as engineer of the Welsh water supply scheme will cover the entire amount under that head, including the amount due for the preparation by Mr. Mansergh and his staff of something like four thousand plans.

The parish church of St. Germans, Cornwall, which was restored three years since from plans by Messrs. St. Aubyn, Wadling, and Luff, has just been beautified by the erection of a parclose screen of oak in the south arcade. This, as well as the oak choir-stalls, and a figure of our Lord as the Good Shepherd placed in a niche in the morning chapel, has been executed by Messrs. Harry Hems and Sons, of Exeter.

An installation of electric light has just been completed at Ayr. It has been carried out from plans by Mr. Robert Hammond as consulting engineer, Mr. Ernest C. Pink being resident engineer. The cost has been £20,000.

The waterworks committee of the Bath City Council have received a report from Mr. Gibby, their engineer, stating that the total cost of the new reservoir at Monkswood has been £30,729.

The French School of Athens has made a complete archaeological survey of the ancient Byzantine city of Mistra on the slopes of Mount Taygetus, and have discovered many inscriptions and architectural remains, which will be exhibited at Sparta. The Greek Department of Public Instruction has now ordered the restoration of some of the most important monuments of the place.

Mr. E. G. Wood, scientific instrument maker, of 74, Cheapside, one of the last of the old school of City residents, died last week in his 85th year. For nearly forty years he had lived in Cheapside over his business premises. He was originally trained as a wood-carver, and examples of his craftsmanship are to be seen at Windsor Castle and in several of the City churches.

Sir Clare Ford, the British Ambassador at Rome, presided, on Tuesday afternoon, at the opening lecture of the British-American Archaeological Society. Professor Laniani gave an interesting account of the sunken Roman galleys in the Lake of Nemi, in the course of which he demonstrated, from objects which had been found, that they belonged, not to the time of Tiberius, as had long been believed, but to that of Caligula.

The town council of Newport, Mon., decided on Tuesday that there should be municipal buildings provided at Maindee, a suburb which was a few years ago incorporated with the borough. The granting of municipal buildings is understood to have been one of the conditions on which Maindee consented to be joined to Newport.

The parish church of Llanblethian, Glamorgan-shire, is about to be restored. The work, which is estimated to cost about £1,000, has been intrusted to Mr. C. B. Fowler, F.R.I.B.A., of Cardiff.

The new workhouse infirmary, Walsall, is nearing completion. It is being erected from the plans and under the superintendence of Mr. H. E. Lavender, architect, of Walsall. The wards are being warmed and ventilated throughout by means of Shorland's patent Manchester stoves, with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The town council of Ossett decided on Monday to take steps for the erection of a town hall and courthouse, on a site in Bank-street, at an estimated cost of £8,000.

At the monthly meeting of the Morecambe District Council on Monday, it was decided to carry out the construction of a new roadway and promenade from East-view to Bare—a distance of about a mile—the surveyor to prepare plans, estimates, and prepare for applying to the Local Government Board for sanction to borrow the requisite money.



## CONTENTS.

Scottish and English Art .....	81
Common Sense in Architecture .....	82
The Soane and Institute Prize Drawings .....	83
Concert Halls and Assembly Rooms.—IX. ....	83
Architectural Association .....	86
Classic Details and their Application .....	88
"Old Masters" on the Continent.—XXIX. ....	90
The Building News Directory .....	91
Our Illustrations .....	91
The Royal Institute of British Architects .....	91
Building Intelligence .....	110
Architectural and Archaeological Societies .....	110
"Hurstmere," Hind Head .....	111
The New Sydney Markets, New South Wales .....	111
The Motion of Abnormal and Vitiated Atmospheres .....	112
National Skating Palace (late Hengler's) .....	112
Books Received .....	112
Obituary .....	113
Correspondence .....	113
Intercommunication .....	114
Legal .....	115
Water Supply and Sanitary Matters .....	115
Our Office Table .....	115
Meetings for the Ensuing Week .....	116
Trade News .....	117
Tenders .....	117

## ILLUSTRATIONS.

"THE MUSIC LESSON INTERRUPTED," BY PETER VAN SLINGELANDT.—NEW CITY MARKETS, SYDNEY, NEW SOUTH WALES.—DESIGN FOR THE SHOREDITCH PUBLIC BATHS AND FREE LIBRARY.—LYCH GATE, KNOWSLEY CHURCH.—PORCH AT THE "ELMS," ROEHAMPTON.—POLICE-STATION, SCOTSWOOD-ROAD, NEWCASTLE-ON-TYNE.—MODERN AMERICAN AND GERMAN FURNITURE.—"HURSTMERE," HIND HEAD, SURREY.

## Our Illustrations.

## "OLD MASTERS" ON THE CONTINENT.—XXIX.

In continuation of our series of reproductions of noteworthy pictures in the principal Continental art galleries, we give this week an excellent example of *genre* work by Peter van Slingelandt, one of the Dutch painters who flourished in the latter half of the 17th century. The work illustrates with some dry humour an "Interrupted Music Lesson," and is one of the treasures of the Royal Gallery at Dresden. Mr. Eastlake's descriptive article will be found on p. 90.

## CITY MARKETS FOR SYDNEY, N.S.W.

We illustrate to-day, by plan, elevations, and section, this important municipal enterprise, now in course of construction from plans by, and under the supervision of, Mr. George McRae, city architect of Sydney. A full description appears on p. 111.

## PUBLIC BATHS AND FREE LIBRARY (PASSMORE EDWARDS), SHOREDITCH.

The accompanying view and plan illustrate the design which was marked No. 8 in the late competition, and it is the work of Messrs. Gibson and Russell. We have already noticed this design, which undoubtedly ranked among the best sent in. There remains, however, nothing more to add on this occasion, and the plan is interesting as showing, in contrast to the others already illustrated, how diverse a similar arrangement for the same building may be made in items of detail. We understand that a paper war is in progress over the award, and the dissatisfaction expressed by the professional press continues to be re-echoed by the parties more directly interested.

## LYCH GATE, KNOWSLEY CHURCH.

This lych gate was recently erected as a memorial to the late Earl of Derby by the servants of his household. It stands upon a base of red Woolton stone, and is constructed entirely of English oak, the roof being covered with oak shingles. The builder was Mr. J. Pilkington, of Rainford, St. Helen's, and the architects were Messrs. Grayson and Ould, of Liverpool, the carving being done by Mr. E. O. Griffith, of Liverpool.

## PORCH, ROEHAMPTON.

This porch was designed to form part of some extensive alterations and additions recently carried out to a house in Roehampton by Mr. W. Howard Seth-Smith, F.R.I.B.A., of 46, Lincoln's Inn-fields, London, W.C.

## NEW POLICE-STATION, NEWCASTLE-ON-TYNE.

THE new police-station in Scotswood-road was opened early in last month. The buildings have been erected from the designs and under the superintendence of the architects, Messrs. Marshall and Dick, 4, Northumberland-street, Newcastle, their plans having been selected from designs submitted in open competition. The main building is three stories in height, the principal front, facing the Cruddas-park, being flanked with gables rising above the roof of the central portion. The red brick facing is relieved by stone dressings, a deep frieze of stone above the second-floor windows running the full length of the main elevation. The accommodation provides for the housing of thirty single constables, six of whom are auxiliary firemen. An inspector will also reside on the premises, a house distinct in itself being arranged for him, and communicating with the main building only through his office. The ground floor of the main building is occupied by the charge-room, parade-room, inspector's and sergeant's offices, surgeon's room, six cells, stores, &c. On the first floor are the reading, recreation, and mess rooms, kitchen, boot and drying rooms, one large dormitory, two rooms for the messman, and large lavatory, bath-rooms, &c., for the use of the constables. The top floor is occupied by the dormitories, and bath and lavatory accommodation. A new feature is introduced by the dividing of the dormitories by partitions about 7ft. high, so that each occupant has practically a room to himself, with bed, table, chair, and window. The basement contains the heating apparatus for warming the cells, and a coal store is provided in the yard. The contractor was Mr. Alex. Bruce, of Newcastle, and Mr. Charles Dixon acted as clerk of works.

## MODERN AMERICAN AND GERMAN FURNITURE.

THE three Chairs at the top of this sheet of sketches are from American sources, that to the left being designed for the fine decorated entrance-hall of the Catholic Club House, New York, of which Messrs. Shickel and Co. are the architects. The seat and back are of embossed leather; the top rail and rail under seat are both shaped and carved. The chair to the right is one of a suite used in the dining-room of a house at Hopedale, Mass., Mr. J. Pickering Putnam being the architect. The central chair, designed for church use by Mr. Robt. Brown, jun., is studiously severe, and recalls in several particulars one exhibited at the Arts and Crafts' last exhibition in London, a sketch of which we gave in our issue of Oct. 20, 1893. It was by Mr. Lethaby, and we have since seen it in the studio of Mr. Heywood Sumner. The three pieces of furniture below, consisting of two large Armchairs and a Writing Table, are a selection from the furnishings for the new German Parliament Buildings, by Mr. J. D. Heymann, of Hamburg. The chairs are upholstered in leather. A good point in the writing-table is the introduction of the shaped supports between front and back legs of pedestals.

## CHIPS.

Last Thursday evening a report by Mr. Somers Clarke, F.S.A., F.R.I.B.A., was read to the Society of Antiquaries upon the destruction now going on at the famous Roman fortress of Kasr-ash-Shammah in Old Cairo, and photographs of it in its present and recent states were shown.

The Batley Town Council resolved on Friday that application be made to the Local Government Board for powers to borrow £18,000 for the paving of Bradford-road with granite, £336 for the improvement of Commercial-street, and £193 and £373 respectively for the flagging of causeways.

A new hospital is being erected at Welle, Somerset, and special consideration has been given to the ventilation, which will be carried out on the Boyle system, the latest improved form of the patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

The Glasgow Fire Brigade, now numbering 910 men of all ranks, attended last year to 810 calls, of which 122 were false alarms. The total loss by fire in the city for the year was £95,000. The total loss in Glasgow by fires during the past ten years has been £1,078,000.

A new board school at Merrywood, Badminton, near Bristol, will be opened on Tuesday next. It is in four departments, and has two central halls, cookery-room, and classrooms. The external walls are of red brick, with courses of buff bricks, and freestone dressings. Accommodation is provided for 1,160 scholars, at a cost of £16,600. The architect is Mr. Edward Gabriel, of London and Bristol.

## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE prizes and medals for the year were awarded at a sparsely attended meeting of the Royal Institute of British Architects on Monday evening last. The President, Mr. F. C. Penrose, F.R.S., made the following announcements. The *The Institute Silver Medal and 25 guineas* for a prize essay on "The Influence of Material on Architectural Development," was awarded to Mr. Banister F. Fletcher, A.R.I.B.A. A prize of £5 5s. was voted to Mr. J. J. Cresswell, A.R.I.B.A., of Grimsby, and a Certificate of Merit to Mr. E. A. Jolly, of Buckingham Gate. There were eight competitors. The *Institute Silver Medal and Ten Guineas* for measured drawings was competed for by four students, and awarded to Mr. H. P. G. Maule, of Ealing, for a set of drawings of Hampton Court Palace. A Medal of Merit and £5 5s. was given to Mr. C. W. Smith, of Finsbury Park, for drawings of Gedney Church, Lincolnshire. The *Soane Medallion and £100* was competed for by 17 competitors. The prize was taken by Mr. R. Shekleton Balfour, A.R.I.B.A., for his design marked "Ad Finem," for an Institute for Architects. Mr. John Anderson was voted a Medal of Merit and £5 5s. for his design marked "Thor," and Mr. E. A. Richards was placed third with his design called "Bow Bells." The *Pugin Studentship* was won in a competition of six by Mr. C. C. Brewer, of Watford, Herts. The *Godwin Bursary* was awarded Mr. A. N. Paterson, M.A., of Glasgow. The *Queen Jones Studentship*, for drawings illustrative of colour decoration, fell to the lot of Mr. H. C. Corlette, Onslow Gardens, S.W. For the *Tite Prize*, value £30, for the design for a stone bridge, was secured in a contest of ten by Mr. H. A. Crouch, A.R.I.B.A., of Bloomsbury. The *Grissell Gold Medal and Ten Guineas*, for a design for polygonal band-stand, was awarded to Mr. J. H. Tonge, of York. There were nine competitors. The *Aldwinckle Studentship* was taken by Mr. H. S. East, of Shepherd's Bush, and the *Ashpitel Prize*, for the most distinguished candidate in last year's A.R.I.B.A. qualification examination, to M. G. J. Swift; a second prize being given to Mr. C. H. Wainright, of Chancery-lane.

The drawings of the following prize winners are to be on view next week at Conduit-street:—Mr. J. H. Tonge, Soane Medallist, 1894; Mr. H. S. East, Soane Medallist, 1895; Mr. A. J. Dunn, Pugin Student, 1895; and Mr. J. J. Joass, Owen Jones Student, 1895, whose work received the unqualified approval of the Council.

The townspeople of Longton, Staffs, were shrewd in electing the Duke of Sutherland as their Mayor last November. They have had before them for some time a project for erecting municipal buildings, and on Tuesday received an offer from their municipal head of a large site of land lying between Cromartie-street, Rosslyn-street, and Stone-road, as a free gift. Needless to add, they jumped at it.

As a result of local opposition, the North-Eastern Railway Company have withdrawn their Bill for the purchase of the Hull and Barnsley railway undertaking, by which they proposed to invest six millions additional in the port of Hull.

Excellent progress continues to be made with the Warwickshire Photographic Survey. The number of photographs of places of interest now taken, the gratuitous work of the members of the Survey, is over two thousand. The third exhibition of pictures will be held in the Birmingham Art Gallery during February, and the works will afterwards be formally presented to the corporation of that city.

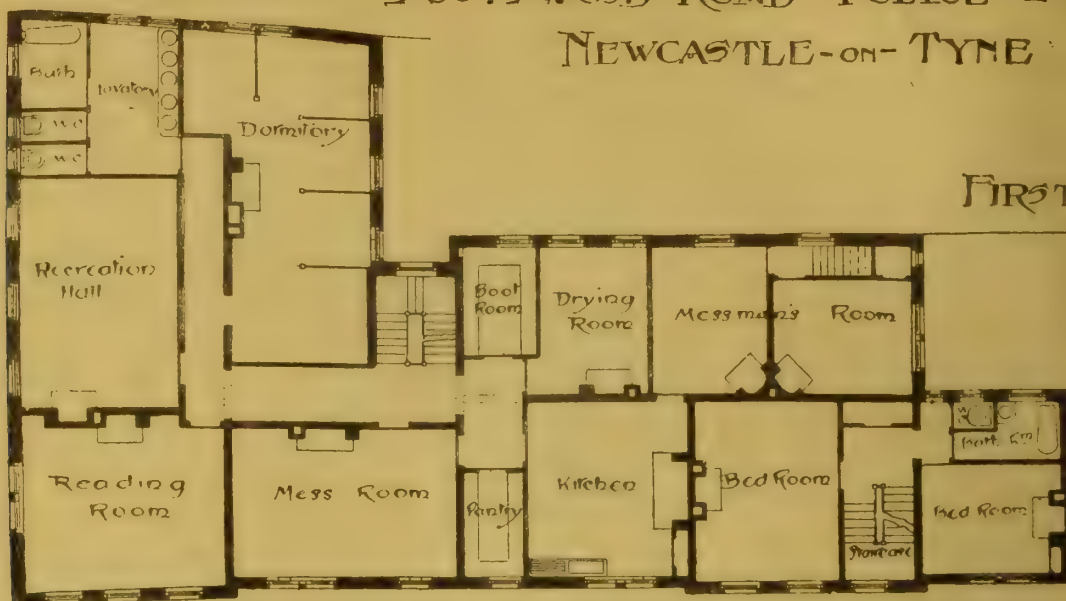
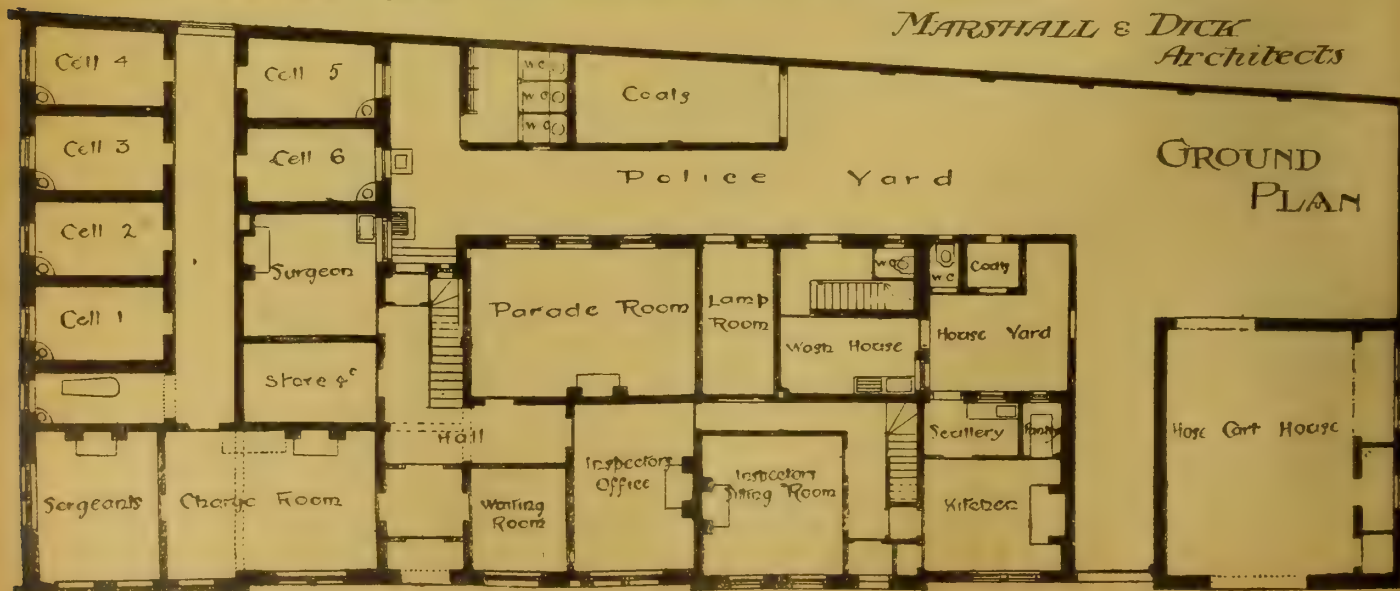
At the instance of the London County Council, the Partington Advertising Company were on Monday summoned to Westminster Police-court for setting up an advertisement hoarding at the corner of Victoria-street and Francis-street without the consent of the Council. For the defence, it was argued that it was not a structure, but was an exception, as being "a requisite for builders' work." The magistrate, however, dissented from this, and fined the defendants 10s. Notice of appeal was given.

After a discussion, the town council of Glasgow accepted at their last meeting, by 60 votes to 7, the offer of the Association for the Promotion of Art and Music in Glasgow to hand over their funds and the buildings in course of erection and finish the Art Galleries. The Association will hand over a sum, with interest to be added, of not less than £135,000. The object in view is to provide for the housing of the valuable pictures and the art treasures of the corporation, collections estimated to be worth at least £250,000.



# SCOTSWOOD ROAD POLICE STATION NEWCASTLE-ON-TYNE

FIRST FLOOR

MARSHALL & DICK  
Architects







PUBLIC BATHS & FREE LIBRARY (PASSMORE EDWARDS) SHOREDITCH.

DESIGN NO 8. SUBMITTED BY MESSRS GIBSON & RUSSELL





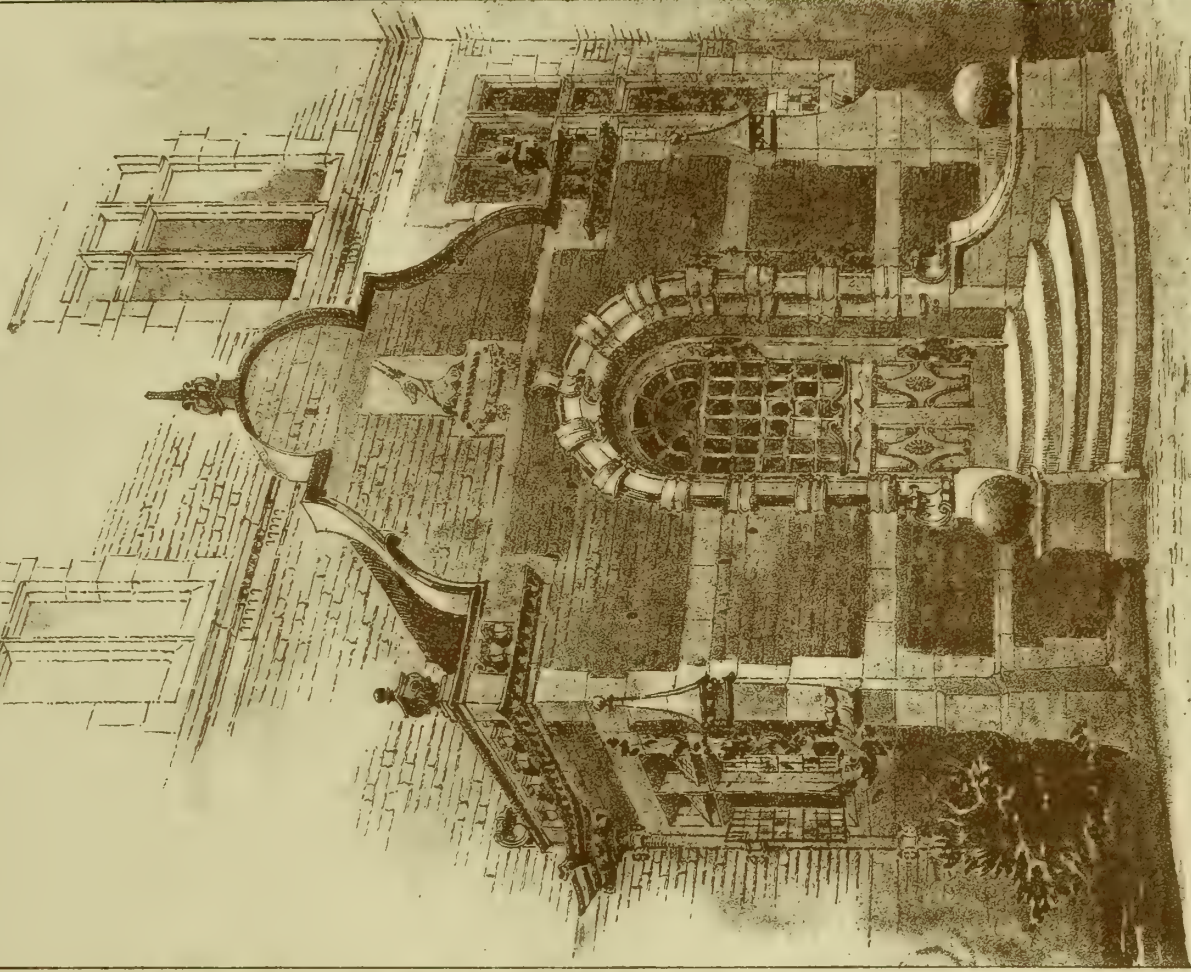
Lych Gate



Knowsley Church:

Grayson and Ould Architects

W.H. SETH-SMITH-FRIBA ARCHT



Porch of St. Elms' Rectory

PHOTO-TINT BY J. C. AGERMAN & CO. QUEEN SQUARE LONDON W.1

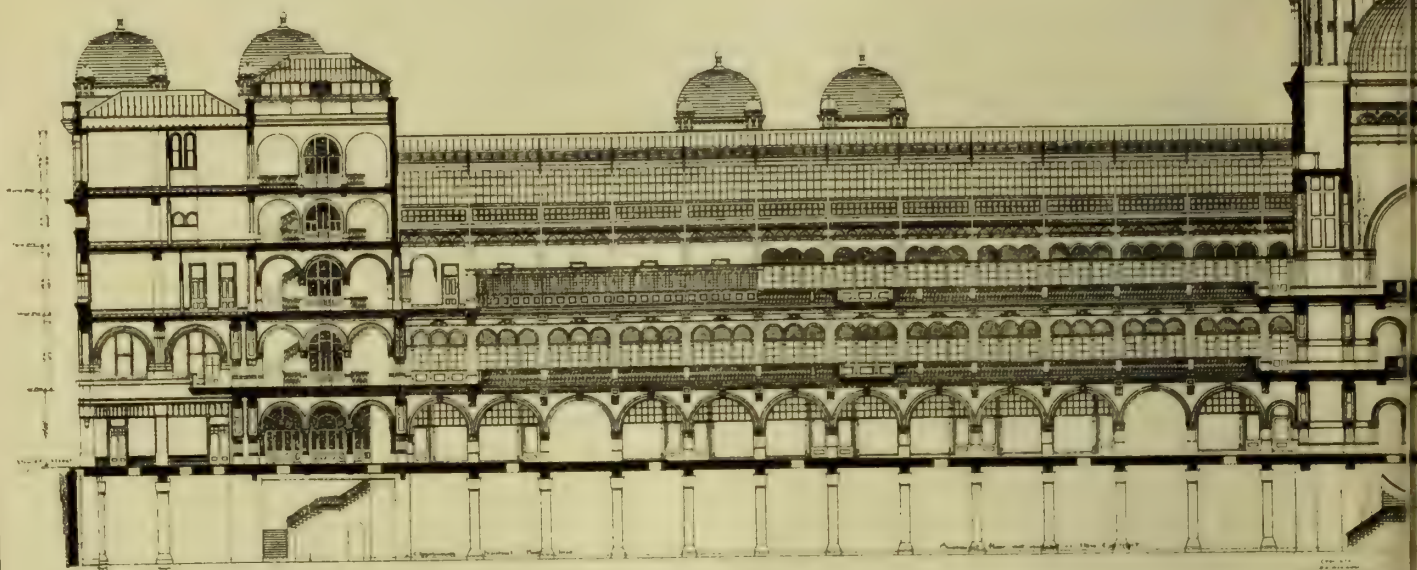












Scale of Feet

Longitudinal

# New City Markets

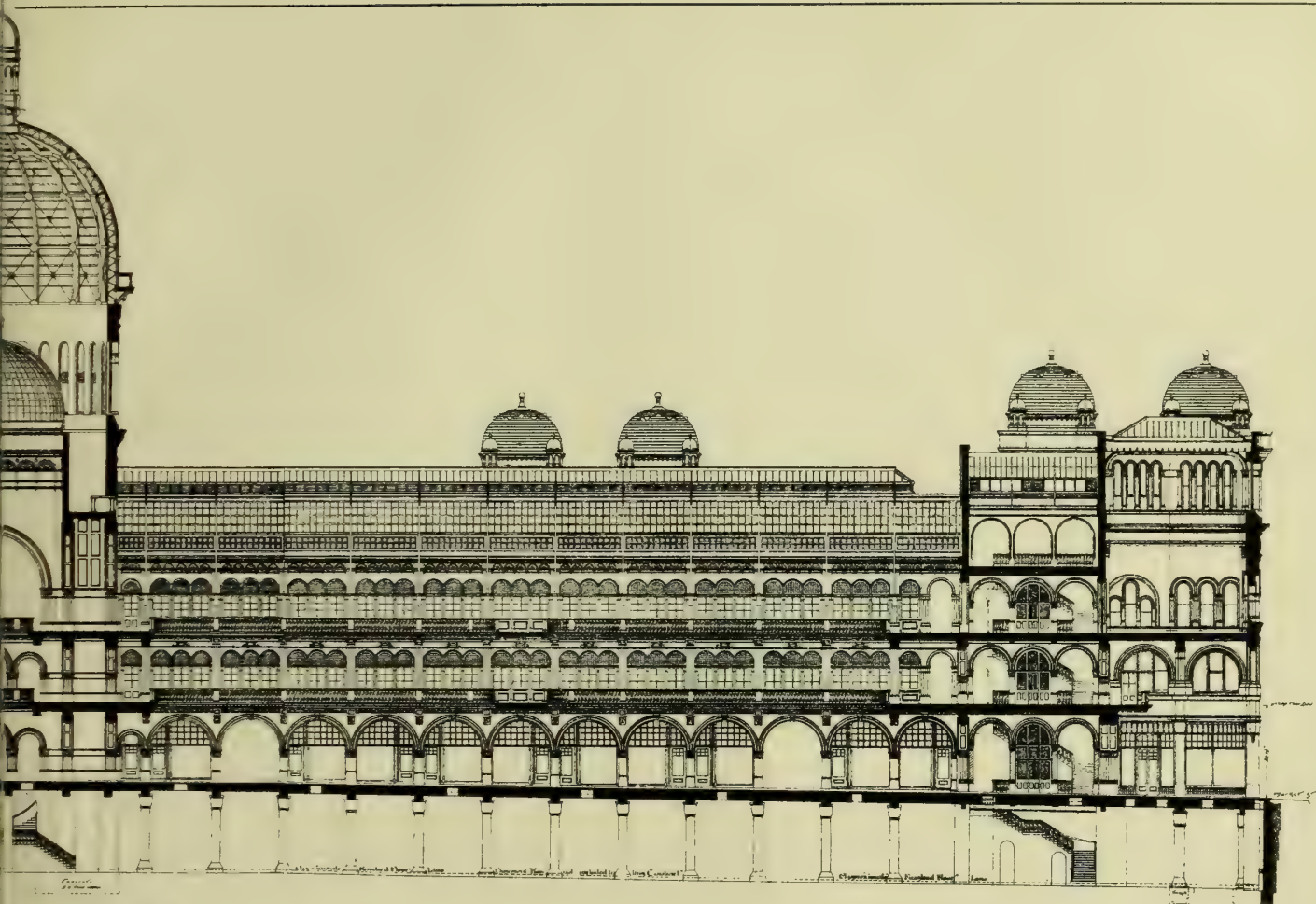
George Street Sydney



Scale of feet

Elevation





Section

GEORGE MCRAE CITY ARCHT



George Street

*James Averis*  
City Architect





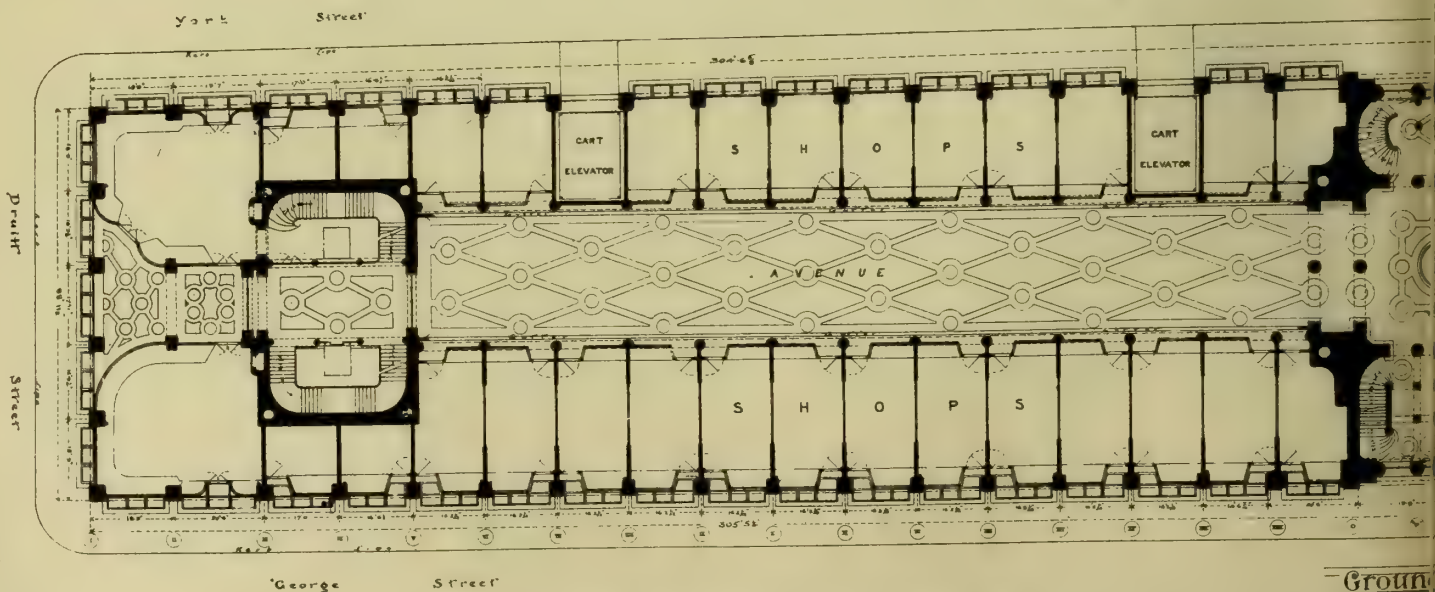






# : New City Markets :

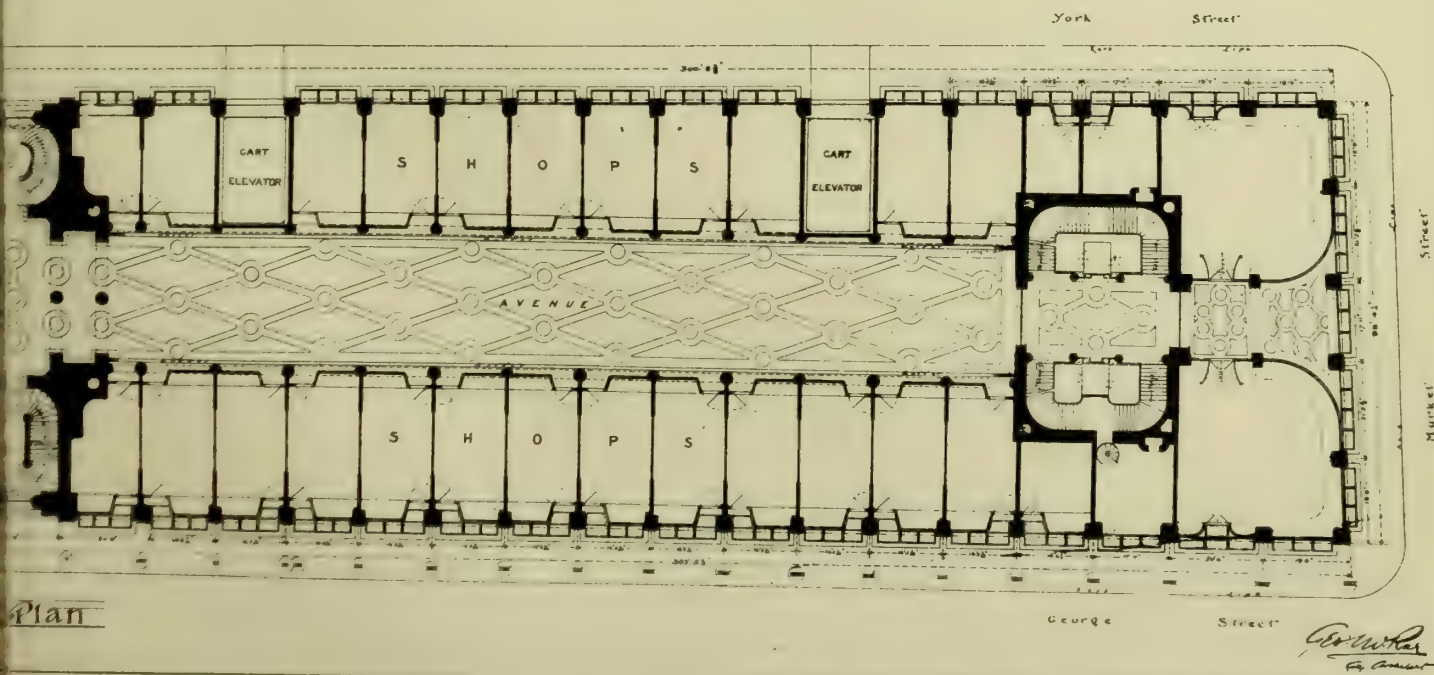
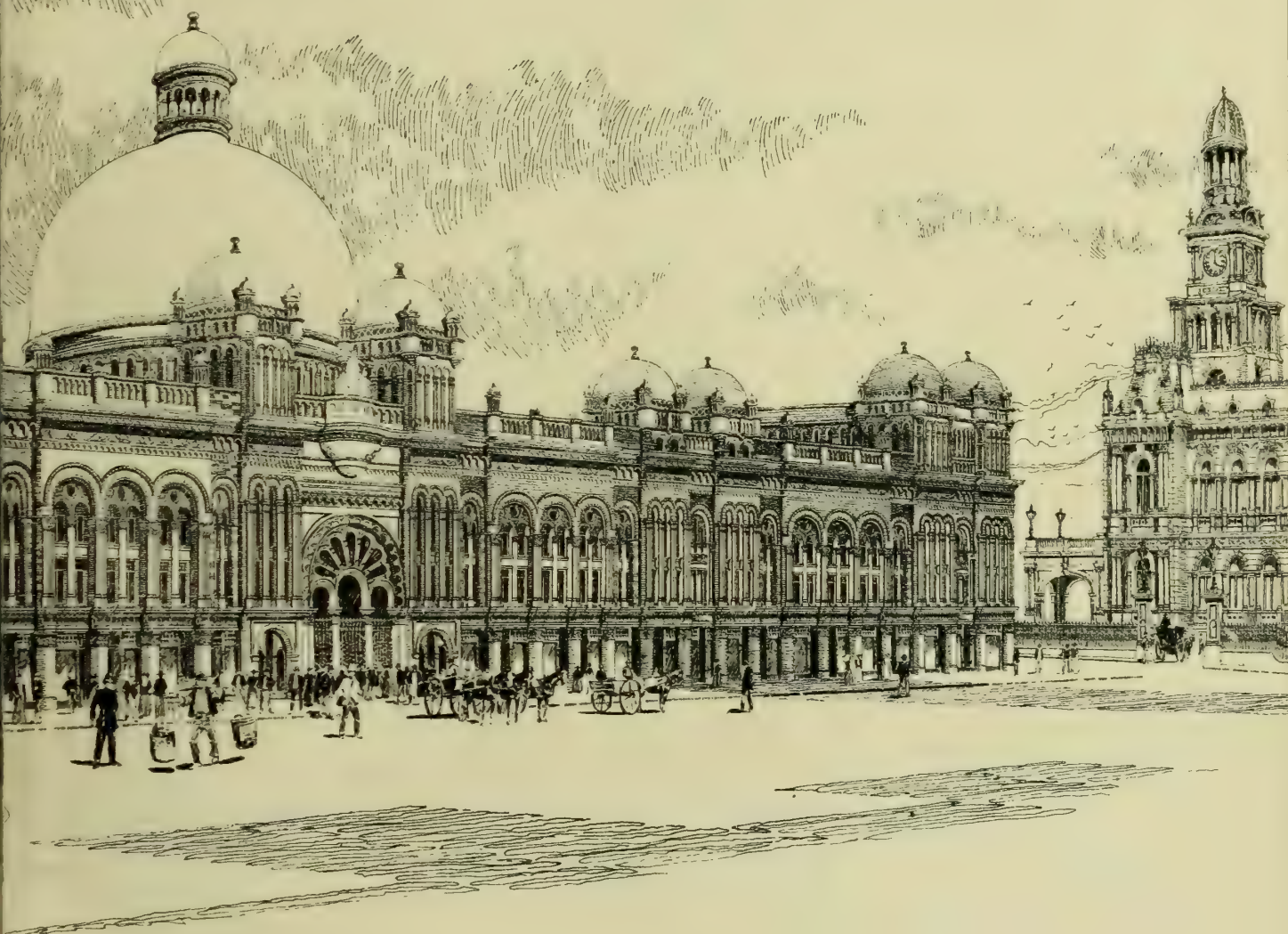
: George Street Sydney :





JAN. 17, 1896.

GEORGE MCRAE CITY ARCHT













THE BUILDING DEWS, JAN. 17, 1896.







- PHOTO BY FRANZ HANFSTAENGL -

## OLD MASTERS · ON THE · CONTINENT · N°29 ·

THE MUSIC LESSON · INTERRUPTED (DRESDEN) BY PETER VAN SLINGELANDT · (B. 1640 · D. 1691) DUTCH SCHOOL.

"PHOTO TINT" BY "THE ARTIST" · Queen's Square, London W.

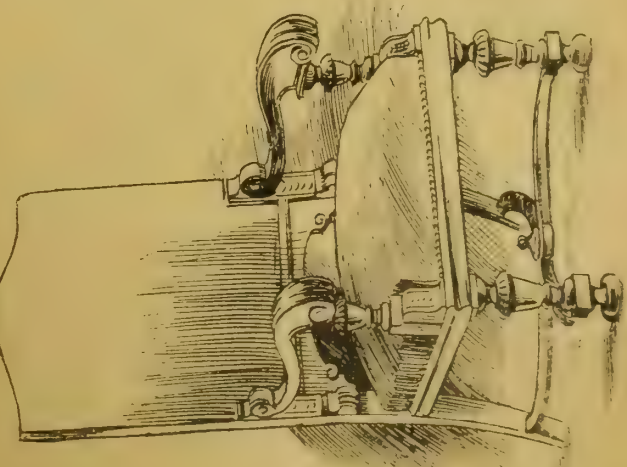
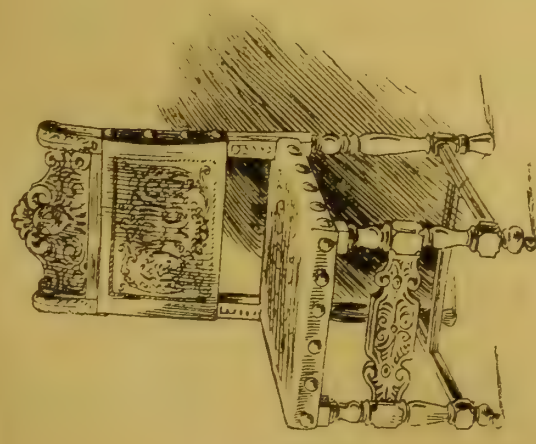




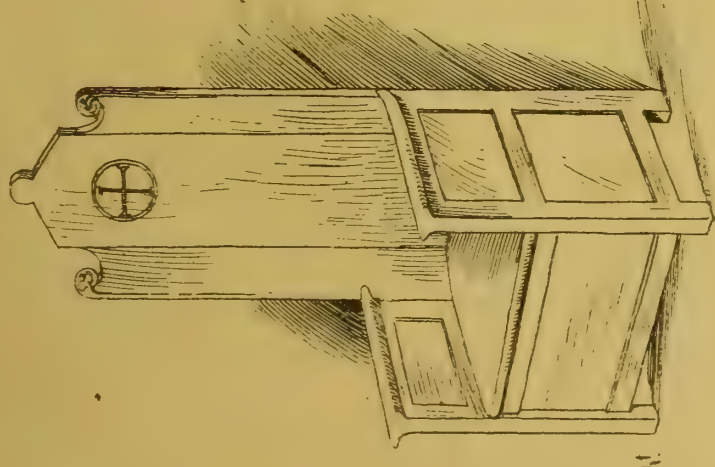


Modern  
American  
and German  
Furniture.

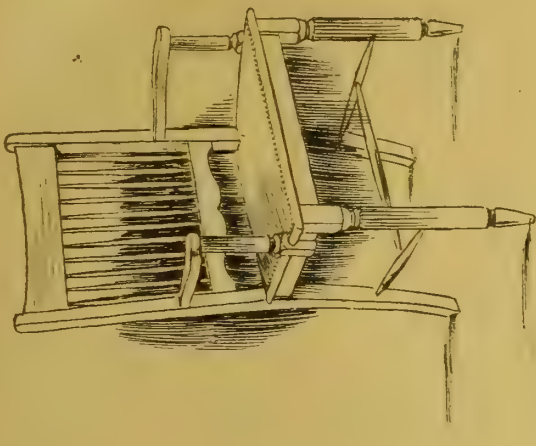
Hall Chair  
Catholic Club House New York  
Messrs Wm Schickel & Co Architects



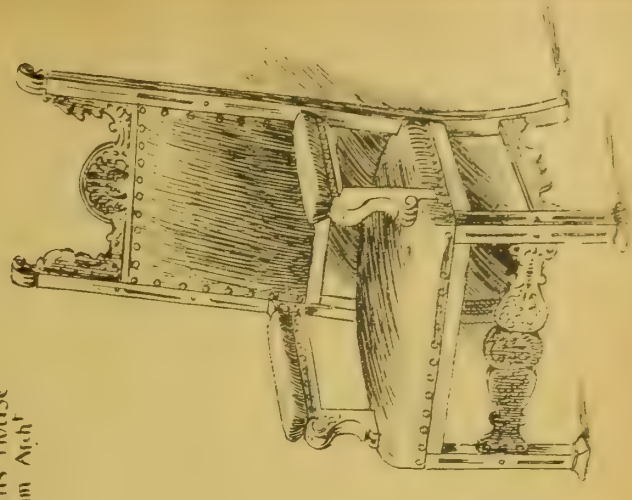
A. E. Chancellor del.



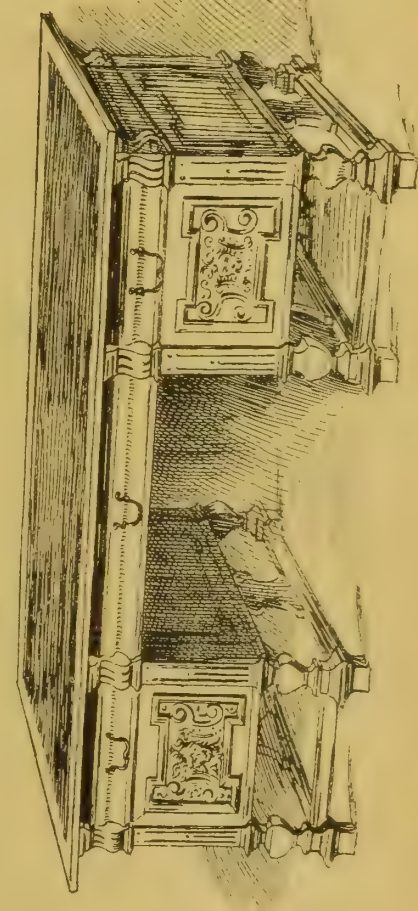
Church Chair  
Designed by Robt Brown Architects



Dining Room Chair  
in a Massachusetts House  
J. P. Putnam Architect



English del.



Writing Table & Leather-covered Chairs  
for the German Imperial Parliament House by J. D. Heymann



## Building Intelligence.

**BELFAST.**—In the course of a recent sermon in the parish church of Belfast, Canon O'Hara referred to the proposed cathedral. He remarked: The committee appointed to deal with the subject have commissioned two of the most eminent architects in Ireland to prepare the necessary plans and designs, which will, we hope, be ready about Easter. These designs will enable members of this congregation, and the public generally, to see what it is exactly that we propose to build. We do not expect to be able to undertake at first more than a part—perhaps a small part—of the entire fabric, but we hope that in that part we shall have space for a large congregation, as well as good accommodation for preaching. It will probably be long before all can be accomplished; but it may not be long before a beginning is made. The chief difficulty will be the want of money; but if we persevere, I doubt not that ere long God will put it into the hearts of some rich people to supply what may be needed for at least part of our work.

**DENSTONE.**—At a cost of £1,000, a bequest from the late Canon Heron, the whole of the oak panelling of the stalls in the chapel of Denstone College has been finished. The panelling runs almost up to the arch of the sanctuary, with return stalls at the west end. Above the seats projects a continuous canopy, carried on brackets springing from detached pillars, and having a carved and embattled cornice. The panels immediately beneath this cornice are filled with tracery, which is more extensive and elaborate above the twenty separate stalls which are provided on each side of the west end of the chapel. These, with the ten return stalls, similar in ornate design, are for the Fellows, fifty in all. The stalls for the head master and the chaplain are immediately eastward of these, and project slightly beyond the rest. On the decani side, close to the entrance from the ante-chapel, is the provost's stall, that of the vice-provost is on the cantoris side. The whole of the work is in wainscot oak, and has been executed by Messrs. Norman and Burt, from the designs of the college architect, Mr. B. Ingelow.

**HALIFAX.**—Technical schools are on the eve of completion at Halifax, from plans prepared by Messrs. Jackson and Fox, of that town, at a cost of about £18,000. The site adjoins the west side of the People's Park, and an area of 3,800 sq. yds. is covered by the building. The building is of a rather plain character, the style being a free treatment of the Renaissance. In the basement is one classroom, 44ft. by 17ft., three 4ft. by 22ft., and one 22ft. by 23ft. There are also the porter's house, boiler-house, &c. On the ground floor there are a classroom 44ft. by 30ft., two classrooms 44ft. by 45ft. each, and one 45ft. by 30ft.; a lecture-room 44ft. by 36ft., and another room 44ft. by 13ft.; one chemical classroom 44ft. by 25ft., one committee-room 44ft. by 25ft. In the room above is a lecture theatre 66ft. by 44ft., another room 44ft. by 10ft., mechanical engineers' 44ft. by 41ft., painting-room 45ft. by 30ft., antique and cast classroom 45ft. by 34ft., elementary classroom 45ft. by 43ft., advanced classroom 45ft. by 30ft., master's room 26ft. by 14ft. Mr. Adam Foster is the contractor for masonry, and Mr. John Fleming for joinery; Mr. Henry Wilson is the clerk of works.

**HOLLOWAY-ROAD, N.**—The governing body of the Northern Polytechnic Institute report that the first two sections of the building in Holloway-road and Brand-street, designed for the purpose of a Polytechnic Institute, are now nearly completed. The buildings comprise workshops for wood and metal work, brickwork, and masonry; engineering laboratory, printing office, chemical and photographic laboratories, rooms for classes, science lecture theatre, art studios, gymnasium, administrative offices, boiler and engine rooms, and men's refreshment and common room. Mr. Charles Bell, F.R.I.B.A., of Salters' Hall-court, whose design was selected in competition, is the architect, and the contractors are Messrs. McFarlane Brothers, of Hornsey-road, N. The cost of the freehold site was £8,500, and the structures in course of completion will involve an additional outlay of £17,500. To carry out the entire scheme as originally designed, a further sum of £15,000 is needed. We illustrated Mr. Bell's selected design by a double-page perspective and plan in our issue of August 24, 1894.

**HORSHAM.**—Active preparations for the re-

moval of Christ's Hospital to Stammerham, near Horsham, have recently been in progress. Messrs. Ingress Bell and Aston Webb, whose plans for the new buildings were selected in competition in June, 1894, are completing the working drawings of the buildings, and the Horsham Urban Council has promised to give the management every assistance in the matter of sewage disposal, proposed to be included in the council's work. (We illustrated the selected design in our issues of June 22 and 29, and July 6 and 13, 1894.) Three directors of the London, Brighton, and South-Coast Railway Company, with the chief engineer, general manager, goods manager, traffic superintendent, and other officials, together with several of the governors of Christ's Hospital, have visited the site of the new buildings in order to locate the station which it is proposed to erect for the convenience of the establishment. It is supposed that the station will be placed in the fork formed by the junction of the Guildford branch and the main line of the railway, with platforms for both branches. The work is to be commenced early this year, and to be completed within six months. It is significant, as an indication that the work will now be carried forward, that the present council have acceded to a request from the old governing body to appoint a sub-committee to confer with that body upon any points that they may wish to submit to Parliament for inquiry; but with an instruction to the sub-committee that the removal of the boys' school to Horsham is no longer a matter for discussion, and with a proviso that there is to be no interference with the progress of work at Horsham.

**LITTLE LEIGHS.**—The church of St. John-the-Evangelist, Little Leighs, Essex, has been reopened, after a thorough restoration, carried out at a cost of over £1,600. The architect was Mr. Nutt, of Windsor. As the work proceeded several interesting remains were discovered, all of which have been preserved; such as credence, piscina, and sedilia at the east end of the nave (which show, as did the walls when the plaster was removed, that originally the church had no chancel), rood-loft stairs, Norman window arches, and stoup for holy water. When the wide semi-circular-headed window, with oak frame, in the west wall was removed, the internal stone jambs and plays of an Early English lancet window was discovered, and left, and the new window was adapted thereto. The original open seats have been repaired and retained, but the more modern high-backed pews, which have occupied the greater part of the chancel, have been removed. A carved oak screen and choir-stalls have been introduced. The sanctuary has been raised three steps above the nave. The east wall, being defective, has been entirely rebuilt upon concrete foundations. The three chancel windows are new. The pulpit is made of old carved wood taken from the pews. The altar-table is surmounted by a stone reredos, upon which is the text, "Lo, I am with you always, even to the end of the world." A new porch and vestry have been added.

Mr. J. Passmore Edwards, in a letter addressed to Mr. Foskett, the chief librarian of the Camberwell Public Libraries, has promised to contribute £3,000 towards the erection of a suitable building on the site given by the Estates Governors of Dulwich College. This will enable the commissioners not only to establish a branch library at East Dulwich, but to go on with another on a site already acquired at Nunhead.

The Mitchell Library, at Glasgow, has been enriched by the addition of a manuscript volume giving a sketch of the life of the late Master of Works, Mr. John Carrick, written by the late Mr. Thomas Gildard, hon. president Glasgow Architectural Association.

Holy Trinity Church Schools, Southport, were completely destroyed by fire on Friday, the damage being estimated at £3,000. The schools, which were situated at the rear of the church, had been enlarged from time to time, and provided accommodation for over 1,000 children. The central hall had been used on the previous evening for a meeting of the committee for the rebuilding of the church, a work just begun, and involving an outlay of £20,000.

The question of the treatment of the sewage of the borough was again under discussion at a meeting of the Salford Town Council on Friday. It was resolved to make application to the Local Government Board for sanction to borrow £40,000 to carry out the borough engineer's scheme as adopted at a special meeting of the council ten days previously.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

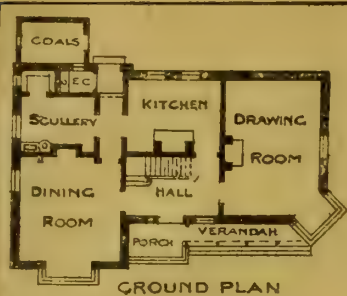
**EDINBURGH ARCHITECTURAL SOCIETY.**—The first annual meeting was held in Dowell's Rooms, George-street, Jan. 8, to constitute the society, adopt rules, and elect office-bearers for the ensuing year. The society is the outcome of a desire amongst the junior members of the profession to form themselves into a body on the lines of the London and Glasgow Associations, which shall consist of architectural assistants and pupils only, as distinct from the Edinburgh Architectural Association. Mr. A. R. Scott occupied the chair. The meeting was large and most enthusiastic, and augurs well for the successful career of what has been felt to be a much-needed want in the Scottish capital. The following office-bearers were unanimously elected:—Hon. president, Mr. Sydney Mitchell (of the firm of Messrs. Sydney Mitchell and Wilson); president, Mr. A. R. Scott; vice-president, Mr. J. A. Williamson, A.R.I.B.A.; secretaries, Messrs. W. A. Mellon and D. McLeod Craik; treasurer, Mr. G. Murray Wilson; librarian, Mr. J. Hay; committee, Messrs. A. Greig, A. Muirhead, W. N. Cumming, A.R.I.B.A., A. R. Stewart, J. N. Scott, and J. Murray.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The monthly meeting of the members of this society was held on Tuesday night at the School of Art, Arundel-street, Sheffield, the chair being occupied by Mr. E. M. Gibbs. The following elections took place as Associates:—Messrs. F. W. Brook-Greaves, Harold Dawson, J. C. A. Teather, Frank Wilson; and as Students: Messrs. W. J. Beall and R. B. Brook-Greaves. Mr. Percy Fitzgerald, M.A., F.S.A., of London, then read a paper on "The Adam Architecture." We published on Nov. 8, 1895 (p. 685, last vol.), a full report of the lecture as given by Mr. Fitzgerald before another architectural society. On the motion of Mr. J. D. Leader, seconded by Mr. H. W. Lockwood, and supported by Mr. C. J. Innocent and the Chairman, a vote of thanks was accorded to the lecturer.

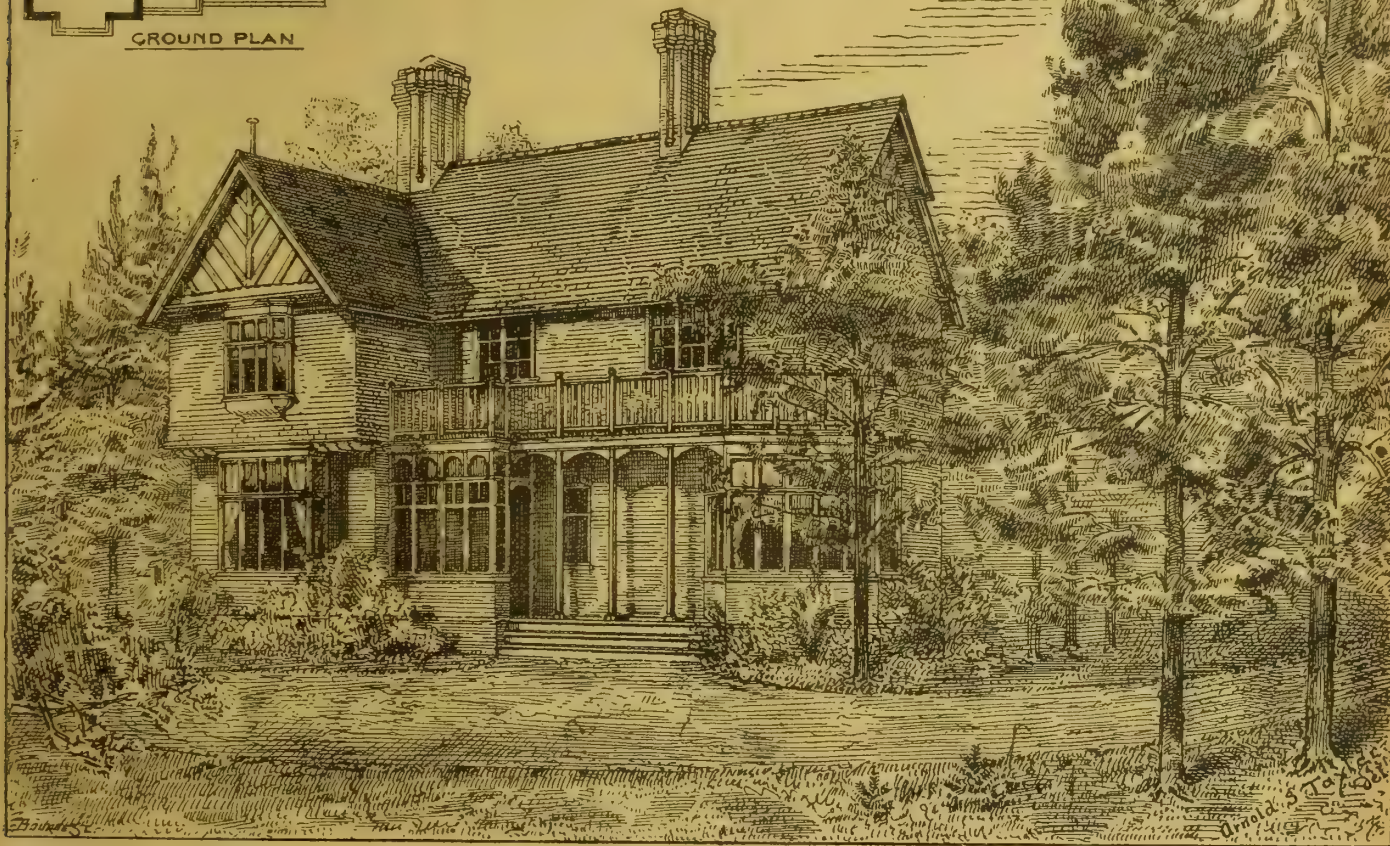
**SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.**—The thirty-seventh annual report of this society records the decease of Mr. E. P. Loftus Brock, F.S.A., who for many years faithfully discharged the duties of honorary secretary, having been present on nearly every occasion at the council and other meetings. The council also regret that Mr. James Edmeston, F.R.I.B.A., finds himself, through pressure of other engagements, compelled to resign his positions of chairman of council and honorary treasurer, offices which he has ably held for many years. Dr. J. E. Phené, F.S.A., auditor, has accepted the chairmanship as Mr. Edmeston's successor; and the council has just been strengthened by the accession of Mr. Thos. Brock, R.A., and Mr. J. B. Carrington. Mr. Edmeston has accepted a vice-presidency, offered him in acknowledgment of his long and valuable services to the society. During the past session lectures were delivered by Miss Yorke, Mrs. Aylmer Gowing, Mr. P. H. Newman, F.R.S.L., Dr. Phené, F.S.A., Mrs. Salway, Mr. J. Starkie Gardner, and Mr. J. W. Tonks. The council have elected Mr. Philip H. Newman, F.R.S.L., to the offices of honorary secretary and honorary treasurer. The programme for this session is as follows, the meetings being held on Thursday evenings:—Feb. 6, "The Art Work of Richard Wagner," by H. F. Frost; Feb. 20, "Lincoln Cathedral," by Frederick H. Evans; March 5, "Our Rude Forefathers, 200—600 A.D.," by Edwin Doran Webb, F.S.A.; March 12, "Conversazione, at the Galleries of the Royal Institute of Painters in Water-Colours, Piccadilly;" March 19, "Constable," with illustrations by the painter, by James Orrock, R.I.; April 16, "Euphuism and the Euphuists," by R. A. Douglas Lithgow, M.D., F.S.A.; April 23, "Conversazione, at the Galleries of the Royal Society of British Artists, Suffolk-street;" May 7, "Arts in China," by Francis W. Kitching, late of Foochow; May 21, "Gesso, in relation to Decorative Painting," by Hamilton Jackson, R.B.A.; June 18, "Conversazione, at the Galleries of the Royal Institute of Painters in Water-Colours."

By a majority of one only the city council of Liverpool have decided to grant £300 for an experiment in planting trees in the principal streets. Previous efforts to introduce trees into the thoroughfares of the city have been attended with only indifferent success; but the fault was rather a wrong selection of species than the narrow streets and polluted atmosphere.





"HURSTMERE" HIND-HEAD, SURREY.  
ARNOLD S. TAYLER, A.R.I.B.A., ARCHT.



#### "HURSTMERE," HIND HEAD.

OUR illustration shows a small house which has been built for Mr. R. T. Plimpton, Ph.D., amongst the fir trees on Hind Head, just off the Headly-road, and near the boundary between Surrey and Hampshire. The square bay window at the corner of the drawing-room was so arranged that it might give a view down the windings of the valley below. The walls of the ground story are built hollow; the upper story is tile-hung, and the roof is covered with Broseley tiles. There are six bedrooms, two being attics. The contractor was the late Mr. Robert Pink, of Milford. The works were carried out under the superintendence of the architect, Mr. Arnold S. Taylor, A.R.I.B.A., of 2, The Sanctuary, Westminster.

#### THE NEW SYDNEY MARKETS, NEW SOUTH WALES.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

WE illustrate this week the plans, elevations, sections, and perspective view of the great Central Market in George-street, Sydney, New South Wales, the corner-stone of which was laid by the Mayor of Sydney, Alderman the Hon. S. E. Lees, M.L.C., on September 30th last. The city architect, M. Geo. McRae, designed the buildings. The site devoted to the George Street Markets is an oblong space, close to the Town Hall and near to St. Andrew's Protestant Cathedral, and bounded by four streets, with an eastern frontage of 610ft. to George-street (the principal thoroughfare in Sydney), the same to the rear in York-street, 98ft. 4in. to Market-street on the north, and 89ft. to Druiett-street on the south, where it faces the flank of the town-hall.

It was early in 1893 that Mayor Manning submitted his scheme to the Sydney Municipal Council, and, as a result, the city architect was instructed to prepare designs with alternative

treatment in several different styles of architecture. Mr. McRae accordingly produced four different elevations, designed respectively in the Gothic, Renaissance, Queen Anne, and American Romanesque styles. All the designs possessed considerable merit; but, of course, their merit varied. The least engaging was the Gothic design of Early English type, with Venetian features, the architect's own favourite, and the most artistic of the four was the Italian Renaissance scheme, which displayed considerable cultivated taste; but the picturesque Queen Anne façade was thought by many the most suitable for its position, considering moreover that part of George-street, which from building to building is only 66ft. in width, therefore from no point will it be possible to take in at one glance the entire composition of a design more than 600ft. in length. The erection, however, of the "Equitable's" fine building (described and illustrated in the BUILDING NEWS of July 19) had set the fashion for the American Romanesque, and hence the design which is the subject of this article, and the execution of which was commenced in December, 1893. In the working out for contract purposes, and still further in the preparation of the detail drawings, Mr. McRae has modified and softened some of the American massiveness, or ruggedness, which characterised his first sketch design, and the building will accordingly possess rather the refinement of the Greek Byzantine than the rougher power of the old Western Romanesque—a modification very necessary for a thoroughfare so narrow as George-street, Sydney. The central cupola will rise to a height of 196ft., and the principal semicircular-headed entrance archways will be 40ft. high, springing from polished trachyte columns. The group of statuary corbelled out upon the centre of the principal façade will represent Australia dispensing honours to Commerce and Art, and should stand out well against the somewhat Pisan arcading of the drum of the great dome. The ground-floor piers and a few of the more prominent constructive features

will be of the adamantite Bowral trachyte (which seems likely to entirely supersede grey granite in New South Wales), while the upper portion of the façades will be of the fine ferruginous sandstone of which so many of the Sydney buildings are constructed. The subsidiary cupolæ will be covered with copper sheeting; but the great main dome will be resplendent with aluminium, if the experiments now being made warrant the employment of that metal.

In the matter of plan, there will be, on the ground floor, two rows of 30 shops each for retail purposes, facing George and York-streets respectively, and having entrances and windows both to the street and to the great interior avenue. This will be 32ft. wide, 68ft. high, and arcaded on the ground floor. It will run the entire length of the building, and be intersected by the transept connecting the central entrances, the whole finishing with a semicircular glass and iron roof. Above the ground floor the avenue widens to 40ft., the additional width being thrown into the galleries on the first and second stories. The enormous basement is intended to be used as a wholesale market, provision being made at the York-street entrance for four hydraulic elevators, each capable of sustaining a loaded drag and horses to take the produce to and from the ground floor. The lighting is effected by an abundance of prismatic lights, placed partly in the pavements and stall-boards of the shops by a peculiar mode of treatment to be presently explained, and partly in recurrent circles in the avenue floor, where they are worked into the design of a tile pavement. Both the first and second floors are so planned as to be available for ware-rooms, show-rooms, stores, or offices; but at the end of the second floor will be a large hall suitable for musical rehearsals, exhibitions, and so forth. On each floor the sanitary provision will be of the completest and most modern kind. The entire building will be served by eight staircases, two sets being placed at either end, and the other four in the centre, 6ft. and 8ft. wide respectively.



The central staircases are carried upon freestone arches, while those at the ends are screened by arches, and the wells are utilised for passenger elevators running from the basement to the upper floors. The wells are lighted from above by large glazed lanterns, and the steps throughout are of trachyte, those of the terminal stairways being tailed into the walls to form hanging flights.

Coming to the constructive treatment, the whole of the internal construction, with the exception of the piers for the great dome, is in iron-work, which is encased throughout in fireproof terracotta lumber. The entire external walls above the ground floor are carried on box girders resting on the trachyte piers. The ground floor is constructed with main box girders 2ft. 6in. by 1ft. 6in., which run transversely, and are spaced at about 16ft. centres. These are supported by cast-iron columns of 20in. diameter, having a 2in. thickness of metal, to the spreading caps of which they are bolted. The strut ends of the girders rest upon cast-iron stanchions fixed to the brick piers. The floors generally are immediately carried by 10in. by 5in. wrought-iron joists, spaced at about 5ft. 6in. centres, running longitudinally, and seated on chairs secured to the webs of the box girders. The floor of the avenue, however, is formed of terracotta lumber, 15in. thick, supported by wrought-iron joists, upon which is placed a layer of concrete, varying in thickness from 9in. to 12in., and finished with cement and encaustic ornamental tiling. The floors of the shops and upper-story rooms are of 1½in. tallow wood, carried on 5in. by 2in. Oregon joists, which themselves rest on the wrought-iron joists. On the upper floors the main transverse girders are carried on wrought-iron stanchions, which rest on cast-iron boxes supported by the basement columns, and through which the ground-floor girders pass. The strut ends of the upper girders are bedded in wrought-iron plates seated in the freestone piers. The inner ends of these girders project as cantilevers beyond the ground-floor stanchions, to form the first and second-story galleries to the avenue already mentioned. The just-named avenue stanchions, in addition to carrying the upper girders, also form supports and abutments for the brick arching, which in all cases springs from wrought-iron springs riveted to the stanchions.

The street lighting of the basement has been previously alluded to. In order to keep the basement entirely separate from the shops, and at the same time to utilise the space below the stall-board for lighting purposes, an ingenious and uncommon form of construction has been adopted. The segment of a circle beneath the stall-board is of 9in. concrete, resting on an inverted channel iron bolted to the top of the floor joist, so that the complete isolation of the ground floor from the basement is obtained. But there is another point. It has frequently been found in Sydney that, from some cause or other, the prismatic pavement lights seem to buckle, and the glass to laminate; but whether this be due to the great and sudden variations of temperature, to pressure caused by some slight swelling of the wood pavements under the influence of heavy and protracted rain, or to some other unsuspected cause, has not so far been determined. To guard, however, against this occurrence, the frame containing the pavement lights is fixed only at the roadway end, and allowed full play where it meets the building; while the joint at the angle is so constructed as to be weatherproof under all conditions. The prisms for both the stall-board and the pavement lights, it may be added, are being made to special angles calculated to throw the light in the proper direction, according to their respective positions.

The main roof over the avenue is formed with a series of lattice semicircular steel trusses. These have their starting point above the second floor, and are carried by the wrought-iron stanchions brought up from the lower stories. The trusses are braced and stiffened by 5in. by 3in. by 3in. T-purlins, and upon these the patent glazing is laid, thus affording ample light to the avenue beneath. The ventilation is effected by means of metal louvres fixed to T-iron frames braced and secured to the semicircular principals.

The construction of the main dome, the diameter of which will be 68ft., with a height of 48ft. from the top of the drum to the bottom of the drum of the terminal cupola, is naturally a point of special interest in connection with this vast pile of buildings, since no permanent dome probably has yet been raised of such dimensions, so far as

we have any knowledge, in the Southern Hemisphere, and Mr. McKee may consequently aspire to pose in future records as the Brunelleschi of Australia. This imposing feature of the design, then, is constructed with sixteen trussed principals 2ft. deep, formed of 7in. by 4in. by 3in. T and 3½in. by ½in. double-lattice bars. The principals meet at the top of the curve in a curb plate, 2½in. deep, and are stiffened by lateral braces formed of 7in. by 4in. by 3in. T and double-lattice bars, and additionally strengthened by lateral bracing. The whole construction is still further stiffened by means of 4in. by 4in. by 3in. L purlins, circular on plan, and spaced at about 2ft. 6in. centres. The brickwork forming the drum of the main dome is carried on large steel box girders 3ft. 11in. by 2ft., two of these being laid parallel to one another, 2ft. apart, on either side of the parallelogram over which the dome occurs. On these doubled girders are laid 4in. by 4in. by ½in. rolled iron joists at 5in. centres, and upon this iron platform the brickwork is carried up. The cupola on the top of the dome is formed with sixteen ribs of 6in. by 4½in. rolled joists, stiffened by lateral L-irons 6in. by 4in. by 3in. The whole of the cupola is secured to a special base formed by 3in. plates, 2ft. 9in. deep, with 7in. by 3in. by 3in. T stiffeners. This base rests immediately upon, and is secured to, the curb ring already mentioned, which forms the junction of the lattice trusses of the main dome. Each principal is secured to the brickwork drum of the cupola by 1½in. rods passed down into the brickwork for 22ft., and there anchored by means of spread plates. The sub-dome, or inner glass dome immediately beneath the main dome, is constructed entirely of light iron framing, the main ribs, 16 in number, being 6in. by 3in. rolled joists, stiffened by means of 4in. by 4in. by 3in. T purlins, upon which the glazing is laid. The smaller domes are, of course, constructed on the general principles above explained. The building, which, when completed, will contain about 220,000c.ft. of stone and some 2,600 tons of iron, is expected to be ready for occupation by the beginning of 1898, when Sydney will assuredly have reason to be proud of her market accommodation, and her municipal council and her city architect of their respective shares in providing it.

#### THE MOTION OF ABNORMAL AND VITIATED ATMOSPHERES.

DR. R. S. HALDANE, lecturer in physiology, Oxford University, spoke at Edinburgh on Friday night to the members of the Scottish Natural History Society on "Abnormal and Vitiated Atmospheres and their Action on Man." Dr. Macmillan presided. Dr. Haldane first noted the effect of vitiating atmosphere upon flames. When, he said, the oxygen percentage in the air fell from the normal, about 20.9, to about 17.3, matches, lamps, and candles were always extinguished. Whereas it was often said that 3 per cent. of carbonic acid would put out flame, and carbonic acid was actually recommended as an active agent in extinguishing fires, he had found a flame burn brightly in an atmosphere composed of 30 per cent. of oxygen and 70 per cent. of carbonic acid. Going on to record the results of his experiments upon the human subject by the diminution of the oxygen in the air breathed, he found that when the oxygen fell to 13 per cent. there was no real discomfort except damp, that when the percentage fell to 8 the face began to assume a leaden colour, and that when it decreased to 5 or 6 per cent. there was marked panting, accompanied by failure of the senses and of power over the limbs. The breathing of atmosphere free from oxygen, or containing only a small percentage of oxygen, caused the subject to be unconscious and fall over within about forty seconds, and without any perceptible previous distress. In these experiments the carbonic acid expired by the subject was absorbed chemically. As to the effects of carbonic acid upon the human subject, he found that when the gas was increased to 10 per cent. the panting became so distressing and intolerable that it was not possible to continue the experiment. Carbonic acid in large percentages was thus a poisonous gas; though when the percentage was less than 3 it seemed to be quite harmless. Coming to the investigation of the effects of vitiated air in dwelling-houses, schools, and public buildings, Dr. Haldane mentioned that in ordinary cases the percentage of carbonic acid was never so high as to be capable by itself of producing dangerous effects. The air must contain about 3 per cent. of carbonic

acid before any abnormal effects presented themselves, whereas not more than one-tenth of that quantity was contained in a crowded room. The same general remark applied to the slight diminution which occurred in the oxygen. Subsequently discussing the effects of carbonic oxide, he pointed out that its symptoms were identical with those produced by atmospheres poor in oxygen. Coal gas contained from 5 to 10 per cent. of carbonic oxide, so that 1 per cent. of coal-gas in the air would produce the headache, nausea, and other preliminary symptoms of carbonic oxide poisoning. Finally noting the effects of sulphuretted hydrogen, Dr. Haldane stated that whereas it was said that 3 per cent. of this gas might be breathed without danger, his experiments led him to the conclusion that that percentage would cause almost instant death.

#### NATIONAL SKATING PALACE (LATE HENGLER'S).

THE building known as Hengler's Cirque, which was erected some twelve years ago for the late Charles Hengler from the designs of Mr. C. J. Phipps, was bought early last year by the National Skating Palace Company, and has undergone considerable alteration under the direction of Mr. C. J. Phipps and Mr. W. Houseck, joint architects of the company. The main body of the structure remains; but two of the supporting pillars have been removed, thus affording more clear area space for floor.

The natural ice floor has been pronounced a great success. It has an area of 11-200sq.ft. The works have been executed by Patman and Fotheringham, for the builder's contract; R. Moreland and Son, for steel girders and constructional ironwork; Messrs. F. De Yong and Co., for the decorative work; Messrs. G. Beattie and Co., for the furniture and upholstery; H. Noel, for the mirrors. The ice floor is executed under the patents of Messrs. Tyler and Ellis and Messrs. J. and E. Hall. The building is lighted in an artistic way entirely by electricity, the installation for this and for the ice-producing being in the large vaults on the basement. Mr. J. E. Walker has been clerk of works.

#### BOOKS RECEIVED.

*Richard Morris Hunt: His Art and Work*, by BARR FERREE, Hon. and Corresponding Member R.I.B.A. (New York: Broadway), is an excerpt from "Architecture and Building." The author gives a descriptive and critical notice of a man who stood in the front rank of American architects. Though neither very original nor very American, Mr. Hunt was a refined and scholarly designer, and one who, as we are told, "absorbed too much of European culture" to be otherwise. At any rate, he received many honours. The Société Centrale of France, and the Italian Academy of St. Luke, the Royal Institute of British Architects, and other bodies conferred upon him favours. A good portrait, photo. illustration of the residence of John Jacob Astor, and "The Breakers," Newport, R.I., &c., are given as examples of Mr. Hunt's skill. The residence of Mr. T. Gerry, New York, has a thoroughly French refinement in the grouping and details, and is a good example of his admiration for the chateau style. The magnificent Baltimore House is the largest country house erected in this style in America. Mr. Barr Ferree's estimate of Mr. Hunt's genius as an architect is worth reading. — *The Housing of the Labouring Classes*, by H. PERCY BOULNOIS, M.Inst.C.E., City Engineer, Liverpool (London: the St. Bride Press, Ltd.), is a reprint from the *Surveyor*, and deals with the question of housing the labouring classes and back-to-back houses. As Mr. Boulnois says, the huge block system of tenement houses has failed to provide accommodation for the class they were intended for, and the casual labourer and "submerged tenth" are obliged to seek houses and tenements unfit for habitation. The sketch plans in outline are suggestions of the class of dwellings that are required for those who cannot afford to pay more than 1s. per room per week. The author gives a few types of dwellings erected in Paris, which consist of a living-room, a bedroom, and small kitchen. These and some of the Glasgow dwellings with small bedrooms—or, rather, closets—are bad. The Stockton types consist of a bedroom of good size, and a smaller one behind, suggested by Mr. Henman, of Birmingham. Suggested plans are also given by



Professor Banister Fletcher and Mr. J. Corbet of dwellings in Dublin, which comprise a front living-room, bed-recess, and stairs, a back bedroom and scullery, or two bedrooms; also of the dwellings erected in Liverpool at a rental of 5s. per week. Some of these tenement houses are of three stories, with a continuous balcony at each floor-level, and a space in the rear for washhouses. Each floor consists of a living-room 9ft. 6in., a scullery and w.c. in front, and two bedrooms 8ft. by 7ft. behind, with common stairs. Another type shows each dwelling to consist of four rooms, a parlour in front, bedrooms, and kitchen, with covered yard, &c.; there are three stories. The latest Liverpool type resembles the Scotch dwellings; a living-room 12ft. by 13ft., a bedroom behind, and a scullery in the rear. In many cases all these have been financial failures. The author thinks rightly that the object should be to provide self-contained cheap houses at reasonable rentals. These should be in blocks of three stories, each house containing a tenement of two rooms on each floor, a living-room of 160sq.ft., and a bedroom behind of 50sq.ft. to 100sq.ft., with balcony on first and second floors at the back over yard. The sketch-plans include types erected at West Hartlepool, Jarrow-on-Tyne, Texteth Park, Chesterfield. All interested in the question of housing the labouring classes in our large towns will do well to peruse this little handbook.

*The Engineering Magazine* for January (London: George Tucker, Salisbury-court) to hand contains an interesting article on "The Value of Good Architecture in Cities," by Mr. Barr Ferree, in addition to other articles of an industrial and engineering kind. Mr. Barr Ferree compares American and European taste and methods. Of the national architecture of the former, the author admits the less said the better—"it exists to the defoulment of our cities, and the defacement of our national intelligence." He compares the monumental buildings and adorned open spaces of Paris, Berlin, Vienna, Dresden, with those found in New York, Chicago, Philadelphia, &c. The two most costly American buildings—the Capitol at Albany, and the new public buildings in Philadelphia—have only their cost and their size to commend them. It is in the private residences and smaller municipal buildings that American architects can boast; the selfish and the personal motives have largely predominated in the cities, and rendered the private villas and mansions attractive, and the influence of these buildings on the public taste has been beneficial.—*General Report of the Librarian of the County Borough of West Ham Public Libraries* gives an account of the proceedings connected with the adoption of the Public Libraries Act, formation of temporary offices, library, &c., opening of the branch library for Canning Town, &c. A full account of this branch library is given, designed by M. Hever Angell, F.R.I.B.A., the foundation stone of which was laid in July, 1895, by Mr. Alderman Hay, J.P., and was opened by J. Passmore Edwards on Sept. 28, 1893, who gave over 1,000 volumes, and who generously erected a wing to the West Ham Hospital. A view of the Central Public Library and Technical Institute to be erected on the Green, Romford-road, from Messrs. Gibson and Russell's design is given.—*Indian Engineering* for December discusses the question of the disposal of sewage, and the irrigation of the Nile storage of flood water, the Bengal District road tramways, and contains several articles of interest.

At a meeting of the Archdeacons and Rural Deans of the diocese of Ely the following have been elected as diocesan surveyors under the Ecclesiastical Dilapidations Act:—Messrs. G. Highton, Bedford; W. M. Fawcett, Cambridge; E. Bonassow, Huntingdon; and J. Flatman, Newmarket.

At the last meeting of the Rochester City Council, the mayor remarked that at Christmas time some ivy was cut from the wall of the castle, to be used in the decoration of the hospital wards. The removal of the ivy had brought to light some interesting features of the ancient stonework which probably had not been seen for at least a hundred years. He suggested that the council should take steps to have more ivy cut away and trees removed from the banks outside the walls facing the esplanade, as they were in some instances dangerous. There were also trees near the castle keep which should be removed; in this opinion Mr. George Payne, F.S.A., concurred. It was agreed to adopt the suggestion, and have more of the ivy cut down; but the question of the removal of the trees will be further considered.

## OBITUARY.

THE death of Mr. JAMES BOSTOCK, builder, of Northwich, took place on Thursday in last week after a long illness. He served his apprenticeship under the late Mr. Joseph Molyneux, and at the age of 25 he was appointed foreman under the late Mr. Thomas Dean, builder and contractor, of Leftwich Hall. Mr. Bostock's employer retired about 1860, and he then took over the business, which he carried on successfully for 34 years. In 1865 Mr. Bostock was appointed builder for the Northwich district to Messrs. Greenall, Whitley, and Co., and since that time he has built for them the Railway Hotel, Goldsmiths' Arms, Green Dragon, Foresters' Arms, Navigation Inn, Old Ship, Eagle and Child, Bridge Inn (Northwich), Horse Shoe Inn (Kingsley), and the Farmers' Arms (Broken Cross). Mr. Bostock, who leaves a large family, retired from business three years ago.

## CHIPS.

The Baptist chapel at Golcar is about to be rebuilt, from plans by Mr. J. Berry, architect, of Huddersfield.

The new mission church of St. Andrew at Marsh Green, Rockbeare, was opened on the Festival of Epiphany. It has been built from designs by Messrs. Tait and Harvey, of Exeter, and the contractor was Mr. Pratt, of Clyst St. Mary.

At Ledbury, Herefordshire, yesterday (Thursday), the Barrett Browning Memorial Institute and Clock Tower was publicly inaugurated. The Bishop of Hereford, the members of Parliament for the city and county, and Mr. Rider Haggard, the novelist, and others, took a prominent part in the proceedings. The memorials have been erected at a cost of about £2,500, from designs by Mr. Brightwen Binyon, of Ipswich, whose scheme was selected in competition in May, 1892.

A stained-glass window has just been erected in the new Presbyterian church, Alnwick. The subjects illustrated are "Christ Blessing Little Children," "The Raising of the Widow's Son at Nain," and "The Daughter of Jairus restored to Life." The artists were Messrs. Atkinson Bros., Newcastle-on-Tyne.

A statue of Lord Reay, who was Governor of Bombay from 1885 to 1890, has been unveiled in Bombay by his lordship's successor, Lord Sandhurst. The statue has cost £2,500, and is placed by the side of that erected in honour of Sir Richard Temple, on the main road leading to the Church Gate railway station.

The foundation-stone of a district church, to be built near the beach at Par-green, Cornwall, at the cost of the Bishop of Truro, was laid on Saturday. The building will be of Cornish type, without aisles, but having a span of 30ft., the roof being of the barrel form. It is to be built of Luxulvan granite, supplied by Messrs. Freeman, with Polyphant stone dressings, and roofed with Delabole slate. The architect is Mr. Edmund Sedding, of Plymouth, and Mr. Philip Blowey, also of Plymouth, is the contractor for the building, the cost of which is estimated at £1,000. The style will be Early English, and 250 sittings will be provided.

The parish church of Holy Trinity, Stockton-on-Forest, has undergone a complete restoration. There has been added a tower and spire, clergy and choir vestries, and organ chamber. The special gifts include a new organ, altar, and also four bells, stained-glass east window, and five other windows filled with stained glass, stone pulpit with marble shafts, and brass reading-desk. Messrs. Naylor and Son, of Derby, were the architects, and Messrs. Thompson and Son, of Louth, the contractors. The reopening services took place last week.

The key-stone of the new water-tower at Middlewich, Cheshire, was laid on Wednesday week. The works of water supply of which this makes the completion have been carried out at a cost of £12,350. Mr. R. T. Worth, surveyor to the district council, was the engineer, Messrs. Birchall were the contractors, and Mr. Broadhurst was the clerk of works.

A road cross has just been added to the 15th-century oak carved screen in the parish church of All Saints, Norton Fitzwarren, near Taunton. On the cross is a figure of the crucified Saviour, and on the north is a figure of the Virgin, and the south St. John the Evangelist. Messrs. Harry Hems and Sons, of Exeter, carried out the work.

Dr. J. W. Appell, Ph.D., who was for many years one of the assistant keepers of the National Art Library, South Kensington, died on the 8th inst. in his 67th year. Dr. Appell was the author of a book on Werther and of several valuable handbooks.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 382, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL., XLI., XLVI., XLIX., LI., LII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., and LXV. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

P. J. DONNELLY. (The sole reason why the chairs appear so diminutive in the view which we gave of the interior of the Carpenters' Hall is the Broddignagian scale of the architectural detail of the building. The chairs, in fact, correctly indicate the relative sizes of the apartment and its decorative treatment.)

RECEIVED.—W. L. B.—R. Sinclair.—H. H. and Co.—C. Symes.—R. P.—G. H.—S. C. and Co.

## "BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Tadpole," "Canary," "Kaffir," "Balbus," "Mysteriarch," "Ghiberti," "Beckington," "The Owl," "Moor," "Cycle," "La Cigale," "Dissinateur," "Nala," "Oberon."

## Correspondence.

## SHOREDITCH BATHS AND LIBRARY COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—In view of the criticisms that have appeared in the Press with respect to the award of prizes in this competition, I am instructed by the Commissioners to ask you to do them the favour of publishing the inclosed letter from Mr. Rowland Plumble, their assessor, which answers the points that have been raised.—I am, &c., H. MANSFIELD ROBINSON,

Clerk to the Bath Commissioners.  
Clerk's Department, Shoreditch Town Hall,  
London, E.C., Jan. 14.

ST. LEONARD, SHOREDITCH, PUBLIC BATHS AND LIBRARY.  
13, Fitzroy-square, London, W.  
December, 27th, 1895.

To H. Mansfield Robinson, Esq., LL.D.,

DEAR SIR,—I have perused the letters received by you from Mr. Tiltman, and dated 10th and 14th December. I have already expressed my great regret that Mr. Tiltman should have withdrawn his design in the way he has done, on the ground that it contains valuable trade secrets, and I the more regret that after doing so, and thus preventing other competitors from criticising his design, he should himself examine theirs with a view to upsetting and casting a slur upon my award.

Mr. Tiltman says that one of the primary conditions was as to the County Council's license, and says that he has observed this and every other condition. Now as a matter of fact, the condition as to the license of the County Council is not a primary condition. It has



nothing to do with the proper use of the bath as a building erected under the Baths Acts, and paid for out of public moneys for a special purpose. Secondly, neither Mr. Tiltman nor any of the competitors have absolutely complied with all of the rules and regulations, particularly Rule 2, neither is this the only rule Mr. Tiltman has not complied with. Although these rules are not all strictly and technically complied with generally by any of the competitors, it never occurred to me to disqualify the whole; but where all are wrong, I think every competitor is disqualified from demanding that the others should be upset on that account. My sole effort has been to award the first premium to the best design. In the one selected, the escape-stairs from the first-class bath gallery led on to the ground floor, but the exits required were provided, and without any but the most trivial alteration, the gallery stairs could have been, and still can be, arranged direct into the street. To have put aside the finest design, both in plan and by far the best in elevation, for such a trivial cause, when I could not justly disqualify it, would have been most unjust to the commissioners and the competing architects. The matter still remains in the hands of the commissioners, and, moreover, their architect and the County Council (who have discretionary powers) have still to settle the matter, as provided for in the conditions, and specially mentioned in my award. Moreover, the matter was specially pointed out and explained to the commissioners, and attention called to the said stairs at the last meeting I had with them before the award was accepted.

The unfortunate withdrawal of the second premiated design, and the subsequent special notice given of it, by one of the professional papers on a private view of the same, having called forth perhaps even more than the usual criticism on the part of some of the disappointed competitors and others interested, I think it necessary to state that I am perfectly prepared to explain all points to your commissioners, should they require any further information in regard to the same.

I should like your commissioners to know that the conditions prepared have been variously criticised, some experts calling them a model of what conditions should be, others considering them too full in their requirements and calling for too much work. I notice as a curious fact, that some of those who complain most bitterly have sent in the largest number of drawings, some as many as 12 to 15 sheets, others as few as 6 to 8, the selected design being amongst the latter number. In the face of this fact, the complaint seems most perplexing.

Some complain that the Baths and Washhouses Act will not allow of the first-class bath being used for the purposes of entertainment. To a limited extent this is partly true, as was pointed out when the conditions were being discussed. By section 5 of the Baths and Washhouses Amendment Act of 1878, "no bath when closed may be used for music or dancing"; but this point was set aside on consideration, as it is notorious that many baths are used for entertainments, both in winter and summer.

Another point raised is in regard to the windows of library or bath overlooking the library or bath site respectively. This condition was, in consideration of the difficulties of the site, qualified in the answers to questions, and nearly half of the competitors availed themselves of the qualification. It was also specially discussed, and a resolution taken thereon, at a meeting of the commissioners, and it was therefore impossible, and would have been unfair, for them to disqualify on this account.

It is asserted on behalf of one design, withdrawn from exhibition, that it has not been selected on account of its having a quadrangle. I can assure you this is not so: it might have been disqualified with the others. It was not selected because it was not the best.

A number of other objections have been taken, some of them incorrect, and all of a trivial nature, too numerous to mention on the present occasion.

I beg to assure you that I have given the greatest and most painstaking attention to the duties I have undertaken. I have given fifteen (15) days' attendance at the hall (apart from the time spent at committees, and at my office) to the consideration of the designs, on many occasions staying till late hours at work thereon, weighing and comparing every point in the designs, and being assisted on purely technical points, when necessary, by a large number of my staff, and I am quite convinced that I have on the whole selected the best planned building. There can, I think, be no question that the principal facade of the building is one in which the architectural treatment has been most successfully carried out. It compares most favourably with all the others. It is a front worthy of a public building, and one in which the distinct uses of the bath and library have been designed in such a way as to produce one consistent and effective whole, worthy of the fine site, and thoroughly well expressing the uses of each of the important blocks of buildings of which it forms a part. In short, without disregarding the conditions, except in regard to really trivial points to which all designs are subject, I have advised you in accordance with the said conditions, to select the best design.

In face of some of the criticisms, it seems almost necessary to assure you that I have acted quite impartially in the matter, and that I know nothing of the successful competitor, and had no idea whose design I was selecting. —I am, yours very faithfully,

ROWLAND PLUNBE.

#### ON THE CHEAP!

SIR,—The Rural District Council of Christchurch invites the submission of plans for an isolation hospital. The following conditions are among the batch:—

"3. The council do not bind themselves to accept any plans, and the architect submitting any set of plans which are not approved will not be entitled to or receive any remuneration whatever for the same.

"5. The remuneration which will be paid by the council to the architect (if any) whose plans are approved will be 5 per cent., calculated on the total amount of any tender which may be accepted by the council for the execution of the works. Such remuneration shall cover the preparation of

all necessary specifications; the preparation of quantities if the council desires the same; the making of any alterations in the plans to meet the requirements or suggestions of the council or the Local Government Board; the attendance, when required, at any meeting of the council or of any committee of the council; the superintendence of the execution of the works in accordance with the plans and specifications as approved by the council and the Local Government Board; the preparation of working drawings and all other works necessary on the part of the architect for the building and completing of the works. The plans to be submitted shall comprise a block plan of the site and proposed buildings drawn to a scale of not less than 1 in. to every 4 ft., and plans and sections of every floor of the proposed buildings drawn to a scale of not less than 1 in. to every 8 ft."

It is hardly necessary to add more. The perhaps uncharitable inference is that the "competition" is a farce, and that some local "willing horse" is already selected!—I am, &c.,

NOT TO BE HAD.

On Sunday morning a fire broke out on the premises of Messrs. Peerless, a well-known building firm at Eastbourne, and entirely burned out the workshops, stores, and stables, doing damage to the extent of about £5,000.

Lewis Berger and Sons, Limited, of London and Sheffield, colour, paint, and varnish manufacturers, held their annual dinner of representatives and management at the Holborn Restaurant on the 3rd inst. The utmost cordiality and good feeling prevailed amongst them all. The management was able to report most satisfying results of the year's work. All the home and some of the foreign and colonial representatives were present. At the close of the pleasant gathering, the staff returned to their respective duties bearing the best wishes of all present. Those who were not present in person, owing to distance, were individually remembered. It was encouragingly noted that Lewis Berger and Sons, Limited, at this time cover the entire globe with a very able and efficient staff of representatives.

The chancellor of the diocese of Southwell, Mr. A. B. Kempe, gave a decision in the Consistory Court on Wednesday week in a suit instituted by the churchwardens of St. Peter's church, Derby, against the lay rector, Mr. Leacroft, for neglecting to repair the chancel of the church. Mr. Leacroft pleaded guilty and submitted himself to the judgment of the Court. The chancellor, in giving judgment, said that the position of a rector of a parish could, in certain cases, be held by a layman, but the benefits were accompanied by the duty of keeping the chancel in proper repair. In the present case the churchwardens had no option but to invoke the unquestionable powers of the Court. The roof of the chancel was full of holes through which the rain came in, and decay had set in in the fabric. He must pronounce that Mr. Leacroft had offended against the law in neglecting and refusing to repair the chancel. A motion would therefore issue requiring him to execute the repairs specified, and he would be condemned in the costs of the proceedings.

Colonel A. G. Darnford, R.E., on behalf of the Local Government Board, held an inquiry on Friday at Barnesley into a proposal by the town council to borrow £6,771 for the purchase of land and the erection of police buildings for the borough. Mr. J. H. Taylor (borough surveyor) said the site was at present occupied by the town hall, the borough surveyor and assistant overseers' offices, and Bradbury's cottages, in St. Mary's-gate and Westgate, and contained 1,292 square yards. The buildings proposed were sergeant's dwelling-house, parade-room, weights and measures office, store, waiting, and charge rooms, chief constable's office, detective and clerk's offices, eight cells, outbuildings; the council chamber would be altered to form a police-court.

The sum of £175,661 is the value of the personal estate of Mr. Henry Clutton, of Hartwood, Reigate, and of Whitehall-place, surveyor to the Ecclesiastical Commissioners, who died on the 17th August last. He bequeaths to his nephew Ralph William, surveyor, £1,000, to his nephew William James £500, to his nephews John Henry and Hugh Henry £1,000 each, to six clerks in the offices of Messrs. Clutton £100 each, to his farm bailiff £100, to the servant of his late sister £90 and a cottage and field for her life, and to various other servants in his house and on his estate legacies of from £5 to £50 and pensions. Mr. Clutton appoints the Hartwood Estate to his nephew Ralph William, and he bequeaths to him all the furniture and effects appertaining thereto. Ralph William is also to have the option of purchase of the Dovers Lodge Estate and the effects there for £10,000. The testator's books on architecture are bequeathed to his nephew Ralph, the son of his brother John.

## Intercommunication.

### QUESTIONS.

[11471].—**Building Regulations.**—A private dwelling-house, which has been built about thirty years, projects in front of the adjoining buildings about 2 ft. on one side and 1 ft. on the other. The owner wishes to alter it into a retail shop by putting in the usual shop-front door and window. In doing so the alteration would in no way project in front of the present line of his house. The surveyor to the local authorities says that he must set back to the line of the adjoining building, and take down and rebuild the upper story and roof of his property. Is he legally compelled to do so? Has it ever been defined as to how much of the front of a building which projects in front of the building line may be altered without necessitating taking down the whole?—JOHN G. DUNN.

[11472].—**Pricing Plaster.**—"100 sq. yd. three-coat plaster to cove, and forming sunk moulded panels, with 10 in. girth mould, vide drawing." Kindly say how the above should be priced by the plasterer, the difficulty being whether the quantity of moulding required and the mitres are included in the description?—PLASTERER.

[11473].—**County Councils and Churches.**—Can any of your legal correspondents inform me whether, after a set of drawings for a church have been examined and approved by the Ecclesiastical Commissioners a county council can, before the work commences, insist on structural alterations being made to suit their requirements?—A SUBSCRIBER.

### CHIPS.

Blasting operations on an extensive scale took place on Tuesday week at the Oldwy slate quarry, near Carnarvon. Some 80,000 tons of granite were displaced, a ton of gelatine explosive being used in the process.

The strike at Moselyfan slate quarries, one of the largest undertakings in Carnarvonshire, terminated on Monday, when the men resumed work.

A new organ, which has been built in the Wesleyan chapel at Acomb, near York, by Messrs. Denman and Son, of York, was formally opened on Sunday.

A plan by the city surveyor of Liverpool, Mr. Sheldermine, has been approved by the Finance and Estate Committee of the corporation of that city for the construction of a boulevard near Newsham-park, at a cost not exceeding £6,500, the minimum price for building land being fixed at 4s. per square yard.

Mr. W. Durden, of Doncaster, a magistrate, alderman of the borough, and one of the oldest Volunteers in the county, died suddenly, on Friday night last, from heart disease. Mr. Durden, who was over 70 years of age, was head of an extensive firm of plumbers and painters, and will be succeeded in the business by Mr. W. Darden, his only son.

Mr. Stephenson, formerly an official of the Treasury, and for some time private secretary to Mr. Jackson when he was Chief Secretary for Ireland, will be the new Chairman of the Board of Works in Ireland, in succession to General Sankey, who is about to retire.

St. Luke's Church, Kingston-on-Thames, has just been enriched by a new pulpit, made by Messrs. Jones and Willis, of London and Birmingham. It is Early Gothic in character, to correspond with the church, and is of Caen stone, marble, and alabaster, the whole being circular on plan. The floor of the pulpit is carried by polished marble columns, with carved caps. The body of the pulpit has panels of tracery work, with a carved figure of St. Luke in the centre one.

The death is announced at Overstrand, Cromer, from bronchitis, of Mr. Edwin Prince, the well-known painter on glass, in his 78th year. Deceased, who was a native of Derby, executed many important commissions for ecclesiastical windows, and was probably the last of the old school of painters associated with the old Crown Derby porcelain works.

Mr. A. J. Hughes has been appointed municipal engineer of Calcutta, in succession to Mr. Kimber. Mr. Hughes will commence his duties in April next.

The city council of Sheffield have approved plans prepared by their surveyor for new public baths for Brightside, estimated to cost £12,600.

By order of the First Commissioner of Works, an arc electric light has been placed experimentally opposite to the Marble Arch within the park. Should the light prove a success, it is proposed to light with similar lamps the footpath between the Marble Arch and Albert Gate, a much frequented route, and also to place another row of lamps round the band stand, for use during the summer months.

In connection with the National Sunday League, the Galleries of the Institute of Painters in Oil Colours, Piccadilly, and the Royal Society of British Artists, Suffolk-street, Pall Mall, were opened to the public on Sunday afternoon, and were visited by 1,375 persons.



## Legal.

### PAVING CHARGES.

THE theory as to the payment of paving charges is that they should fall upon the beneficial owner of the adjoining lands and premises. Usually there is no difficulty, because, with ordinary roads, shops, and dwelling-houses, these fall upon the frontagers. But where one side of a highway consists of a public park or garden, it may be a question whether the authority in whom this land is vested is liable to pay proportionately for the paving and making of the road, &c., or whether these charges must be borne entirely by the owners of the opposite or adjoining properties. A case of this kind affecting Peckham Rye Park was reported in our issue of last week (Jan. 10) from the Lambeth Police-court. There the Camberwell Vestry summoned the London County Council, as owners of the land on the north side of Peckham Rye Park, to pay their proportion of the paving charges for the Colyton-road, upon which the park abuts. The vestry contended that the Council had so dealt with a portion of this land forming the park as to make them beneficial owners, and as such liable to contribute towards the paving of the road.

The magistrate in giving his judgment went upon the broad principle as laid down by the House of Lords, that where the person vested with property holds it subject in perpetuity to the burden of a public right-of-way and user, this deprives him of its beneficial use, and he is not, therefore, the owner within the statutes. Applying this principle to the case before him, the magistrate held that the London County Council were only vested with this land subject in perpetuity to the burden of a public right-of-way and use, which deprived them of its beneficial ownership, and so they were not liable as owners under the Acts relating to street-paving and the like. No doubt this seems reasonable enough regarding the park as public property; but, on the other hand, if the opposite or adjoining owners and frontagers have to pay more than their fair apportionment of paving and road-making charges, it will seem to them rather hard measures. **FRED. WETHERFIELD, Solicitor.**

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my office, as above, by Tuesday morning to insure answer same week.

**MIDLAND COUNTIES. — LICENSE. — HOTEL. — NEW ENTRANCE.**—It will be necessary to get the consent of the magistrates to the alteration. Probably, by application to the clerk, this could be arranged for provisionally, and until the sessions. It would be as well to consult a local solicitor upon such a question.

### CHIPS.

The urban council of Rhyl adopted, on Tuesday, plans and estimates by Mr. Hall, their resident gas and water engineer, for a proposed water-tower and new main, the total approximate cost being £9,517.

The first board school in the village of Scholes, near Rotherham, was opened on Saturday. Mr. B. Snell, of Masbro', was the contractor. Mr. H. L. Tacon, of Rotherham, was the architect.

The Norman church at Haddon, near Stamford, which is now in a very dilapidated state, is to be thoroughly restored. The Marquis of Huntly, the patron of the living, has given instructions to Mr. J. C. Traylen, architect, and to Mr. Halliday, builder, of Stamford, to proceed at once with the repairs that are immediately necessary.

Sir George Nares, on behalf on the Board of Trade, had a private conference with the Peterhead Harbour Trustees on Friday with reference to the application for a loan for deepening Port Henry Harbour. The Loan Commissioners had modified the plans to bring the cost to £36,000. The result of the conference was that should certain objections to the plans be satisfactorily answered, the operations might at once be proceeded with.

Mr. J. Wolfe Barry, C.B., has been commissioned by the county councils of Middlesex and Surrey to prepare designs and approximate estimates for a bridge of stone, steel, or iron to take the place of the existing bridge at Kew. He has also been asked to report as to which of the three proposals he would recommend for adoption.

The governors of Robert Gordon's College, Edinburgh, have accepted tenders amounting to £2,729, for the addition of a gymnasium to the buildings of the college.

## WATER SUPPLY AND SANITARY MATTERS.

**NORWICH.**—A new departure has been made by Mr. A. E. Collins, formerly borough engineer of Reading, and recently appointed city engineer of Norwich. He has placed on exhibition in Blackfriars Hall, in that city, a complete set of plans, sections, and working drawings for the new main drainage works now being carried out under his superintendence, at a total estimated cost of about £152,000. It will replace the main drainage works carried out eleven years ago from plans by the late Sir Joseph Bazalgette and Mr. Morant, then borough engineer, and which proved from the first a costly failure. Sir Joseph Bazalgette recommended that the sewage of the city be taken to Whittingham for irrigation purposes by means of a high-level and a low-level intercepting sewer, connected near St. Anne's Staithe, and carried on direct through King-street and Bracondale to a pumping station at Trowse. These works were carried out under Mr. Morant at a cost of £110,000; but when completed, in 1871, it was found that, instead of the delivery being 2½ millions of gallons daily, it was 5 millions. This involved an extra strain on the pumps, and greater cost in pumping, and the cause was ascertained to be the leaky condition of the main sewer in King-street, into which the water from the springs penetrated. The low-level sewer was not watertight, as Sir Joseph Bazalgette assumed it would be, and, acting on the report of Mr. Hawkesley, who thought the leakage could be stopped at comparatively little expense by means of strutting, the Corporation decided to thus mend the defect. Mr. Thwaites, the next city engineer, condemned strutting, recommending lining it with iron tubing or the making of a new sewer. Sir John Hawkshaw and Mr. Bateman were consulted, and on their advice the Corporation tubed the leaky sewer with iron at a cost of about £20,000. But the leakage, stopped at one place, broke out at another. In 1887, Mr. P. P. Marshall, who had succeeded Mr. Thwaites as city engineer, recommended the continuance of the irrigation system, the abandonment as far as possible of the iron-tubed low-level sewer, and the adoption of the separate plan by which there would be a drainage system for the sewage, and another for the storm waters. The Shone system of lifting the sewage was also adopted. The works proposed were commenced in July, 1890, and in June, 1892, Mr. Marshall resigned, and was succeeded by Mr. Buchan; two years later Mr. Collins was appointed to the office, and finding a watertight main outfall sewer completed, he recommended the city council to adopt a system of intercepting sewers wherever possible. This is now being carried out. The drainage of the city has been divided into eleven districts, five drained by the gravitation system above described, and six by sewers and drains which flow into as many pumping stations, each fitted with a pair of Shone's hydro-pneumatic ejectors, sunk in wells lined with cast iron.

**SHREWSBURY MAIN DRAINAGE.**—On Tuesday, the 7th inst., an inquiry was held at the town hall, Shrewsbury, by Colonel Ducat, R.E., into the proposal of the corporation to borrow the sum of £70,000, for the purpose of carrying out a main drainage scheme. The scheme now before the inspector had been prepared by Messrs. Taylor, Sons, and Crimp, of Great George-street, Westminster. The scheme is intended for a population of about 40,000 persons, and is estimated to cost £70,000.

**SIDMOUTH.**—At a meeting of the urban district council on Friday, a report from Mr. James Mansergh, M.Inst.C.E., was read, dealing with the sewers of Sidmouth. It stated that the 24in. by 18in. concrete sewer was distorted in shape, and the concrete was partially eaten away, and the sewer was not watertight. The 18in. sewer in Bedford-square was also distorted, and leaked. The 12in. sewer on the Esplanade was made with unglazed pipes, and the bottom joints were now open. Seven 15in. sewers were jointed with clay, and in bad condition. The open joints allowed sewage to escape into the subsoil. There could be little room for doubt the sewers with clay joints in range of the tide and those laid below the level of the sub-soil water allowed the infiltration of water into the sewers and the escape of sewage. Something ought to be done in the tide-logged and thickly-populated parts of the district, for it was there the evil was the greatest. The sewers which he proposed should be dealt with were the main sewer from the outfall, and along the Esplanade to Peak Hill-road; Church-street, Coburg-road, Sid-road, Mill-lane, Fore-street, High-street, Salcombe-road, All Saints-road, and the branches. He estimated the cost of relaying these sewers, including 15 per cent. for contingencies, at £3,700. This added to the previous estimate for the new outfall, tanks, &c., brought the total amount up to £9,250. The council will hold a special meeting to consider the report this (Friday) evening.

Mr. Thomas McCormick, builder, of Canonbury-road, N., died on Monday last, aged 73 years.

## Our Office Table.

Too little attention has been paid to the demolition now in progress, under the instructions of H.M. Office of Works, of the Rolls Chapel. The officials have persuaded themselves that the space it occupies is absolutely required for the completion of the Record Office Buildings, and hence, with the exception of the Jacobean monuments—one of which, the Arlington tomb, was illustrated in our pages on the 20th ult.—and the small pieces of wall immediately behind them, the whole building is being destroyed with pickaxe and crowbar as rapidly as possible. Appeals made on behalf of the S.P.A.B., which in this instance has an excellent case, that the south wall, with its 14th-century window, should at least be spared, were disregarded; but the authorities have had made measured drawings of the chapel.

ANOTHER Vandalistic deed in progress in London under the auspices of H.M. Office of Works will be generally regretted—the removal of the dwarf railing, with its enriched details and recurring finials, the spirited and well-modelled little lions by Alfred Stevens, from in front of the balustrade at the British Museum. It appears that the railing is being taken down under an arrangement between the Museum Trustees and the Duke of Bedford, under which the land so inclosed will be thrown into the pavements. But, surely, foot traffic either in Great Russell-street or Montague-street is not so great as to render the destruction of such work inevitable. It is stated that the railings and their finials are being stored pursuant to instructions from the First Commissioner of Works; but even if they should, by a happy accident, be better treated than the columns of Burlington House, and one or two examples be added to the heterogeneous stores at South Kensington, they will have lost their *raison d'être* and be mere curiosities, while the alteration undoubtedly detracts from the dignity and effect of the British Museum courtyard. The lions are charming examples of effective conventionalising of animal forms for ornamental effect, and were a singularly appropriate finish to the Museum buildings, while they protected and gave scale to the heavy railings behind.

As an experiment, one sheet of the geological survey map of England has just been published by the Stationery Office, on a scale of four miles to the inch, at one-fourth of the price formerly charged. The colours are printed by lithography instead of, as in all former publications by the Office, by hand. The sheet issued embraces the country for about 50 miles round London.

An appeal is made by the Dean of Ely for £6,000 towards the substructural repair of the exterior of the magnificent Lady Chapel of his Cathedral. This semi-detached adjunct, one of the finest specimens of Decorated architecture in the kingdom, is reported by Mr. J. Oldrid Scott, the architect to the Dean and Chapter of Ely, to be in a very dangerous condition. The beautiful tracery of the great windows of the chapel, still quite perfect on the inside, has on the exterior crumbled away almost down to the glass line. "A storm of exceptional force"—Mr. Oldrid Scott reports—"would very likely blow some of these windows into the chapel." There is no intention on the part of the Chapter to attempt "a restoration" of the interior of the chapel, for they are aware this is an impossibility, on account of the cost. Towards the work of repair now contemplated the Chapter have received promises of help amounting to £1,600.

UNDER the new rules of the Royal Scottish Academy, Mr. John Faed, Mr. James Archer, Mr. Erskine Nicol, and Mr. John Ballantyne, R.S.A., have requested that their names should be placed upon the list of Retired Academicians of that body. This, with the death of Mr. Waller Paton, makes no fewer than five vacancies on the roll of Academicians, which will be filled at the General Assembly of the Academy, to be held on the second Wednesday of February. At a preliminary meeting of the Academicians, held in accordance with the new rules, it has been agreed that the vacancies shall be filled up from the three classes of members embraced by the Academy as follows: Architects, 3; painters, 1; sculptors, 1. At present there are no architects full members of the Academy. A statutory meeting falls to be held on the first Wednesday of March, at which the Academy decides whether any new Associates will be elected at this time,



and, if any, what number. Should it be resolved to elect new Associates, the meeting for that purpose is fixed for the third Wednesday in March.

SEVERAL contraventions of the Building Act have lately been brought before the police-courts. Among them have been three or more prosecutions against owners and builders for using greenhouses for other purposes than those for which they are intended. In the first case a person was summoned by the district surveyor for converting his greenhouse into a workshop and store for the storage of paint, turpentine, wall-papers, and other combustible materials which contravened the intention of the Act. According to the new statute, a person could build a greenhouse as he liked, if not attached to other buildings, or if attached, so long as he does not make it a part of the building. Builders are accordingly putting up "greenhouses," and afterwards converting them into other uses. In another case it was ordered that no brick wall should be erected between the house and the structure. The Act is certainly defective in not clearly stating what constitutes an exemption from the rules, and the orders given appear to be ridiculous for the object in view—namely, to prevent the spread of fire.

A SECOND part of "Academy Architecture" has just been issued by Mr. Alexander Koch, uniform in size with his summer volume, and comprising several drawings shown at the last Academy Exhibition, together with an assemblage of other subjects, including some English and foreign sculpture. Many of these illustrations are none the less interesting because they were not shown at Burlington House. Among these latter we notice a drawing of the New Markets at Sydney, of which we print to-day some double-page illustrations from the designs of Mr. McRae, the city architect. Among the drawings figuring in this capital handbook or "Architectural Review," and already given in our pages, are Mr. Norman Shaw's Academy perspectives of last summer, reproduced by us the week before last, and the North British Railway Hotel, Edinburgh, by Mr. W. Hamilton Beattie, whose selected design we published very fully last May. The following names are conspicuous in the list of contributors to Mr. Koch's little folio, and furnish a guarantee of good subjects—viz., Messrs. T. G. Jackson, A.R.A., J. M. Brydon, Aston Webb and Ingress Bell, Alfred Waterhouse, R.A., Sir A. W. Blomfield, A.R.A., T. M. Lockwood, Maurice B. Adams, Leonard Stokes, Fairfax B. Wade, C. Voysey, Wm. Emerson, and John Belcher. The reproductions are sharp and admirable.

In a report on last year's Edinburgh Property Market, Mr. Dowell states that the opening of 1895 was not auspicious, but its advance developed unmistakable signs of revival in property, which to its close has not only been maintained, but is steadily strengthening. The prevailing tone of business has been better and healthier than had been experienced since the crisis of 1878, and the most encouraging feature is the improvement in values, which were better than for the last five years. This is corroborated by the returns issued by the burgh assessor, which shows that the rental of the city (excluding railways, tramways, gas, electric lighting, and water) for 1894 was £2,082,814, and for 1895 £2,127,495, being an increase of £44,681—the largest increase in any one year for the last ten years. Notwithstanding this increase in rental, the proportion of vacant property has decreased. In 1894 the proportion to rental vacant was 2.39 per cent., in 1895 it stood £45,563, or 2.23 per cent., which was the lowest percentage recorded. A supplementary return shows that the number of unoccupied houses at Whit-Sunday last was 1,284, while at Martinmas last there were 691 of these occupied, 388 vacant, and 205 demolished, uninhabitable, or withdrawn for various reasons. Shop property in a much larger extent shared in the advance, there being little or none now in the market. Feus have again been and continued in active demand, reaching 33½ years' purchase. There has been a great falling off in the number of estates put on the market. At the same time, those desirous of purchasing found difficulty in negotiating, unless at considerable advances on former upset prices, leads to the inference that land has touched its lowest.

We have received Kendrick's Coefficients for Iron and Steel Beams, a small sheet which can be folded up in any textbook, which will be of much service to architects and engineers who make use of merchants' lists which give the safe distributed

loads which H-sections of steel or iron beams will carry. When a beam is required to carry a concentrated central load, we multiply by 2 to obtain the equivalent distributed load. But when the load is not central, we have no means of comparison. Mr. Kendrick Edwards, Dennistown, Glasgow, has brought out a list of coefficients which he has prepared to meet this want. This table gives "coefficients for any point in any beam up to 40ft. bearing, the said point being expressed in full feet from both abutments. Thus, to ascertain the beam necessary, according to a merchant's list, to carry a given concentrated load, multiply the load by the coefficient, and take the result as the equivalent distributed load, and consult the merchants' lists accordingly." Nothing can be simpler and easier than this list of multipliers as explained by the example given. Mr. Kendrick Edwards has supplied a very useful means of making the ordinary merchant's list available for any loading.

THE *Building and Engineering Journal* of Australia lately published a paper, read by Mr. A. M. Howarth, of the Railway Construction Department, Sydney, before the Engineering Association, on a proposed high-level bridge or sub-aqueous viaduct across Sydney Harbour. Several tunnel schemes have been proposed to be carried under the harbour at depths of 35ft. to 150ft. below water level. Mr. Howarth proposes a pair of balanced cantilever beams carrying a central girder, which he considers the shortest bridge that can be erected across Sydney Harbour. Its total length would be 1,645 yards. The roadway would carry a double tram-line or railway. The type shown in the sketch is that of the Forth Bridge. A full description of the scheme was given in our contemporary, as well as of the tunnel schemes that have been proposed. The sketch design illustrated shows an alternate method for crossing the harbour by a high-level bridge or subaqueous viaduct.

AN album illustrating Falconnier's patent blown-glass bricks is to hand. They are made by the smelting works, Adlerhütten, at Penzig, Silesia, in different models and colours. A wall of glass brick presents an elegant appearance; the daylight enters in freely, but it is not transparent. The bricks are good non-conductors of heat, sound, and electricity, diffuse the light splendidly, and are cheap. The laying of them is very simple, being accomplished in the same manner as ordinary bricks—viz., with mortar or cement. The face of the work can be parted in pilasters and openings for ventilation. The bricks have, we are told, proved very satisfactory for verandahs, winter gardens, factories, and greenhouses.

Lady Penrhyn on Saturday placed the memorial-stone of a technical school in course of erection at Bethesda—the first of its kind established in Carnarvonshire under the Intermediate Education Act for Wales.

French papers report the purchase, for the Louvre, of a portrait group by Lawrence of John Julius Angerstein and his wife. The price given was a handsome one, being £2,400. The same gallery has acquired the "St. Sebastian," by Perugino, which was formerly in the Sciarra Collection at Rome. It cost the French Government £6,000.

The new schools erected by the Dudley School Board at Eve Hill were formally opened on Monday. The schools are faced with red bricks of local manufacture, with terracotta dressings and tiled roofs. Each building comprises a large room 73ft. long by 22ft. wide, three classrooms 24ft. square, cloakroom, and an apartment for the use of the head teacher. All the floors are constructed of wooden blocks, and the large schoolrooms are fitted with patent revolving shutters. In addition to the school buildings, there is a caretaker's house. Mr. R. T. Matthews, of Birmingham, was the architect, and Mr. J. H. Whitaker, of Dudley, the builder, the contract price being £6,460. Mr. G. Hancox has acted as clerk of the works.

In a paper read before the Society of Antiquaries of Scotland, in Edinburgh, on Monday night, the Rev. R. S. Mylne traced the succession of the Masters of Works to the Crown of Scotland, and gave the writs of their appointments from 1529 to 1758. The principal Master of Works was a recognised officer of the king's court from the time of James V. to the death of Queen Anne, and eventually the office was to all intents and purposes merged in Her Majesty's Office of Works. The object of the paper was to give a complete list of the Masters of Works compiled from the original documents, which in most cases have preserved the records of their appointments.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Presentation of prizes, and presidential address to students. 8 p.m.  
Surveyors' Institution. "Re-apportionment of Rates and Taxes," by Col. G. W. Raikes, F.S.I. 8 p.m.  
Northern Architectural Association. Annual Social Gathering, and Exhibition of Sketches. 8 p.m.  
TUESDAY.—National Health Society. "Defective Drains and Sewer Air as Causes of Disease," by Professor W. H. Corfield. 5 p.m.  
Society of Architects. Social meeting for discussions on "The Action of Fire on Fire-resisting Materials," and on "Architects, Local Boards and their Rules." St. James's Hall, Piccadilly. 8 p.m.  
Institution of Civil Engineers. Discussion on "The Sanitary Works of Buenos Ayres." 8 p.m.  
Glasgow Architectural Association. Lecture by P. McGregor Chalmers.  
WEDNESDAY.—Society of Arts. "Supply of Sea-water to London," by Frank W. Grierson. 8 p.m.  
FRIDAY.—Architectural Association. "Copper," by Nelson Dawson. 7.30 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

A SOCIAL MEETING of the Society of Architects will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on TUESDAY, January 21st, at Eight p.m., at which Discussions will take place on—"THE ACTION OF FIRE ON FIRE-RESISTING MATERIALS," "ARCHITECTS, LOCAL BOARDS AND THEIR RULES," and other subjects of architectural interest.  
SMOKING AND REFRESHMENT  
ELLIS MARSHLAND, Hon. Sec.

### CHIPS.

A new branch institute in Vauxhall-street, Plymouth, in connection with the Missions to Seamen, was opened on Friday. The premises were till recently used as a gin distillery, and have been converted to their new purposes from plans by Messrs. King and Lister, architects. The contract was placed with Messrs. A. Lethbridge and Son, also of Plymouth.

The Duchesse of York has honoured Mr. F. J. Williamson, of Esher, with a commission to execute in marble a life-size statue of Prince Edward of York.

The Victoria-road board schools at Ashford, Kent, which were designed by Mr. Henry J. Jeffery, M.S.A., architect and surveyor, of Ashford, and built by Messrs. Amos and Foad, of Whitstable, have been publicly opened. The schools accommodate 340 boys, and have provision for an additional 80 if required.

The pictures recently presented or bequeathed to the Liverpool Corporation for the permanent collection in the Walker Art Gallery have been arranged by the curator, Mr. Charles Dyll, in the small room leading from the Leighton Gallery. These are "The Zither Player," by Vollman; and "Sheep," by E. Verboeckhoven (bequeathed by the late Mr. John Hughes); "The Martyr of the Solway," by Sir John E. Millais, R.A.; "The Madonna di San Antonio" after Titian, by G. Hervey Garroway, from the original in the Uffizi Gallery, Florence (presented by Mr. George Holt); landscape, by Fred Walker (Liverpool School), presented by Mr. Henry Walker.

The Parliamentary estimates for New South Wales show a proposed expenditure of £535,000 on roads, dredging, and harbour maintenance, and only £35,000 on new and repairing public buildings.

Mr. Onslow Ford, R.A., has been commissioned to execute the marble bust of the late Dr. R. W. Dale, which will be placed in the library of Mansfield College, Oxford.

A special service was held last week in St. Mary's Church, Market Drayton, for the purpose of dedicating a memorial window which has been placed in the east end of the chancel. The window, which is by Mr. C. E. Kempe, includes four principal subjects depicting incidents in the life of Christ.

With reference to the paragraph which appeared in our last issue, p. 78, as to the new Cotton Exchange at Liverpool, Mr. Francis Holme, F.R.I.B.A., of Liverpool, writes:—"The Exchange has been erected from my designs in every particular. The structural alterations have been carried out by Mr. Doyle for the owners of the building."

Good progress is being made with the construction of a cliff railway at Constitution Hill, Aberystwith. The grade has been roughly completed from the summit to the second bridge, and also from the bottom to the first bridge, and satisfactory progress is being made in the intervening space. The railway is expected to be opened at Whitsuntide. The engineer is Mr. C. Croydon Marks, who is represented at Aberystwith by Mr. G. Soall. Mr. George George is superintending the works.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### TREES IN TOWNS.

THE city council of Liverpool are just about to "make an experiment" on planting trees in their principal streets. The phrase suggests at first that they are somewhat belated. Elsewhere, the practice, one might be inclined to say, has got far beyond the experimental stage. How long ago it began in London, tradition does not inform us; but it has often been asserted that there is no street there from some part or other of which a tree cannot be seen. The statement, if true at all, can only be true of the larger thoroughfares. The East-End builder, bent on supplying the wants of the working man, seldom thinks that a glimpse of nature is one of them; and he puts up mile after mile of his dismal dwellings with hardly room for a green leaf or a blade of grass. In middle-class neighbourhoods it is otherwise. In the early part of this century there seems to have been a perfect mania for stocking them with trees. Everybody wanted to live in a grove, or a shrubbery, or a *rus-in-urbe* of some sort; though the latter title, bestowed by some classical aspirant on a road at Battersea, is now only preserved in the much-altered form of "Russin Hurby-street."

Yet it does not follow from this that we have tried all there is to try, and have nothing to learn. The tree-planting of our great-grandfathers was nearly all of one sort. There was little of the tentative or experimental about it: for the most part it was the blind following of a fashion. It was looked upon just then as the proper thing to plant a row of trees down each side of a street. The only choice was between lime-trees and plane-trees; the former grow fast, and soon get either cumbrous or shabby. They are bright for a week or two in spring; in summer they become shapeless clumps of ungraceful foliage; and by the end of July, if the weather is hot, the boughs begin to get bare again. "The ruby-budded lime" of which Tennyson sings—a thinner-growing and more graceful variety—is seldom seen in London. The favourite sort here is that which has the largest leaves, and the densest masses of them. It spreads so rapidly that people are obliged, in self-defence, to lop it without mercy year by year; and thus, instead of natural trees, we have almost everywhere hideous pollards. The born Londoner, in fact, hardly realises what a tree is like; the specimens he sees most of have been hewn and hacked into the likeness of overgrown cabbages.

The plane-tree is not used quite so badly. It is less aggressive in its annual increase; less dense and bunched in its foliage. In all ways it is a much handsomer object than the lime; and if it does not put on its dress so soon in the spring, it retains it later in the autumn. Its smooth leaves, too, do not hold the dust. It does not mind smoke or soot, and altogether it suits our requirements very well. But it is possible to have too much even of a good thing. The plane-trees at the West-End of London get almost as wearisome as the lime-trees in the north and south. They are monotonous by their very abundance, and too often monotonous also from the way of planting them. They would be admirable if intermixed with something totally different by way of contrast, with conifers, for instance, if conifers could be made to flourish in our clay soil. And even alone they would be far better than they now are, if half of them were massed in bold clumps, instead of being spaced out at equal distances. The tree-

planter is always being carried away by the idea of an avenue. But avenues, at the best, are very artificial things, and things one soon grows tired of. We have formality enough in our buildings, we might surely venture on a little freedom in our vegetation.

The wind in exposed situations does what it can to render avenues tolerable. It strikes out a tree here, and tears off a bough there, till—as at Drayton Park, Northamptonshire—it has made a picturesque perspective out of what was once a dreary piece of mechanical regularity. There are many such avenues in the Geddington and Oundle districts. The country people call them "vistows." Some are by roadsides, some by carriage-drives, and some in unaccountable directions, across grasslands and ploughed fields—memorials, perhaps, of long-abandoned purposes. The trees there are generally elms. The effect must have been wearisome enough when they were young, and all, no doubt, as far as care could select them, of one size and one shape. They are more satisfactory now, when, by long and fortunate neglect, they have asserted their own individualities; when the snow has bent them, and the storms have broken them. Town avenues are too sheltered to be thus improved, and too much supervised and inspected to grow into their best in their own way. There are causes, indeed, which help to thin them. The gas leaks out of the mains, and poisons the soil, so that some of them die. So far, well; but then it cripples and stunts what are left. The pavements and the asphalt shut out air and rain from the roots, with much the same results, both good and bad. If sea-water comes to be used for sprinkling the streets, we shall have another modifying agency; but not a beneficial one, any more than the two others. The wise planter will see that the roots can run where neither gas, nor salt, nor asphalt can hurt them. He will make his own breaks and "surprises," and will have more fancies in his head than the very stale one of dibbling his standards in at equal distances along regular rows.

Our street trees, after a generation or so, generally get much too big: we do not want them to overtop the houses and to shut out air and light. Ours is not a torrid climate, and we seldom need their shade. It is a misty one, and we could very well do without that addition to our autumnal fogs, which is produced year after year by their fallen leaves. The finest view of a tree, too, is not that which one gets by standing close to its bare trunk and looking up into its interior, yet this is the view which the occupant of a town house is most often presented with. The stem faces his window: there are few leaves for the first 10ft. or more, and what immediately fronts him is the ugliest part of what is perhaps at best a somewhat ugly specimen. This fault cannot be got over by lopping; trees of smaller growth are wanted. But the speculative builder or the local authority which puts them in looks only to first results. If there is an effect of freshness and greenness at the outset, they care little about what happens in twenty or fifty years' time. This is natural on the builder's part. His property is made to sell, and he does not inquire too closely into the good or evil results of the devices which help him to sell it. But local authorities should look further before them. It is their business to consider the future of their towns as well as the present, and to think not only what their "groves" and "avenues" and "shrubberies" will be like when the nurseryman leaves them, but what effect they will have in the course of half a century or so.

Both lime-trees and plane-trees are good where they have room to spread themselves, and to grow unlopped without becoming a nuisance. The planes which border the pavement on the Green Park side of Piccadilly, for instance, are in their right place. There

are no houses behind them to be darkened, and those across the road are too far off to be affected. But in a multitude of cases trees of a smaller sort, or even shrubs, would be far better. There is a prevalent idea that limes and planes are almost the only things that will do well in the London atmosphere. A very little observation will show the fallacy of this notion. Red and white hawthorns flourish, and are loaded with flowers on the very verge of the City. Catalpas are equally at home there. Lilacs do well wherever they can find a yard of soil to root in. Horse-chestnuts flower profusely in the crowded districts of Camberwell and Dalston. A foreign shrub of the broom tribe, with large yellow blossoms, has taken possession of the banks in the North London railway cuttings between Kingsland and Canonbury, and almost runs wild there. Laburnums light up the suburbs in the spring, within a mile or two of London Bridge. White Robinias, commonly called acacias, do the same, and one of the finest English specimens of the Japanese *Salisburia*, a rare tree with a fern-like leaf, is to be found in a garden at Bow. No doubt the street planter is often unsuccessful. But for this there are obvious reasons. He is too near the gas-mains, and too much oppressed by the flagged or asphalted pavements. So it comes to pass that what will grow in the villa garden will not always grow in the street adjoining it, or, at least, in that part of the street in which the local authorities have decided that it ought to grow. When that happens, the local authorities must give way. Nature is quite as obstinate as they are, and considerably stronger. They may find, perhaps, as the man who travels with his eyes open will note at Birmingham and elsewhere, that what fails in one part of a street may succeed in another. There is no law compelling councils and corporations to place their trees on the edge of the causeway, close up to the curbstone. Let them put one here and another there, in irregular positions, where favourable openings occur; and sometimes, if they are daring enough to do it, let them set a mass of flowering shrubs within a railing in the centre of a circus, or at four crossways. Street arboriculture, with us, is strangled by formality, and the very trees which are provided to lessen the mechanical wearisomeness of our towns are generally so treated as to add to and accentuate it.

It is for horticulturists to say what smaller trees we may hope to grow successfully in place of our everlasting limes and planes. No doubt there are plenty of them, which would last for a century or more without needing to be cropped into shapeless deformity. Flowering shrubs would often be better still, but if unprotected they offer too many temptations to 'Arry and his kin. He cannot leave the horse-chestnuts alone, and he would soon destroy the lilacs and laburnums, if they were public property. It is to be feared, therefore, that we must confine ourselves to foliage, and that in this we must almost give up whatever belongs to the fir and larch and cedar class, as unsuited to our soil. But there is an endless variety left, and if we cannot venture on things which would be gay in spring, we may at least employ some which would be bright in autumn. The North American forests, especially, are noted for the richness of their tints towards the end of the year. Their fading foliage is often as beautiful in colour as any flower, and seeing that all their productions are hardy in a severer climate than ours, there seems no reason why some of them should not be available for the decoration of our English streets.

### CIVIL AND MUNICIPAL ARCHITECTURE.

NINETEENTH-CENTURY architecture will be written mainly, not in its great churches nor monuments, but in the record



of its municipal and civic buildings. Its town-halls and city offices, its technical schools, and its libraries and museums, its public baths and washhouses will form the material of the future historian who undertakes to write the chronicle of its progress. The growth of our municipalities, so vividly sketched by Macaulay in his account of England at the Restoration, and the powers since vested in our towns by municipal legislation, have given an impetus to the erection of buildings worthy of the cities and the age. Our great commercial centres and pleasure resorts are vying with one another in possessing edifices for administrative purposes which are outcomes of the highest architectural talent, and worthy of the municipal life which has given rise to them. We can hardly say that our efforts, high as they are, can equal the great municipal edifices we find in France and Belgium. We have few town halls to compare with those of Antwerp, Bruges, or Brussels; nothing to rival them in their noble belfries, those symbols of the old charters and privileges conferred on the Belgian cities of the Middle Ages. These were attached to their town-halls or municipal senate-houses, their guild-halls, trade-halls and market-buildings, like that of the great cloth hall at Ypres. They were noble buildings standing by themselves in large and commanding sites opposite the great squares and market-places, instead of being cramped in narrow streets, or built upon, as in many of our towns, suitable sites can be found. The architects of these old city halls had, therefore, a choice in making an imposing exterior open all round or on the main sides.

It was opportune that Mr. H. T. Hare, A.R.I.B.A., in his useful paper on "Municipal Buildings," before the Association, of which we gave a full report in our last issue, should have dwelt on the planning of such buildings, and pointed to those main considerations which experience has found to be necessary. Too many of those who enter the lists in competitions for buildings of this kind do so under the idea that their general skill in planning is all that is required if they follow out the instructions—a mistake which is soon perceived by anyone who has any special knowledge of the necessities of buildings of this class. Points of plan entirely unobserved, though essential, have escaped the attention of the competitor: such, for instance, as the proper location of the chief official apartments; the necessary proximity of the subsidiary clerk's and other offices to the principal's rooms, of the town-clerk, surveyor, sanitary officer, or borough accountant; the approaches and exits to the council-chamber and public hall. The authors of these plans little think of the public duties of officials and their clerks, or they would not make the offices so inaccessible to the public. How often we find, for example, the borough surveyor, medical officer, and accountant placed on the first and even second floors, instead of being near the main entrance on the ground floor. Again, the semi-state functions of the mayor and town-clerk are not considered: these functionaries are shown scattered in different parts. A good plan, as Mr. Hare hinted, ought to place the council-chamber, mayor's parlour, and committee rooms on the first floor, and in proximity. On state occasions, when public banquets to sovereigns, princes, ambassadors, and other great personages are given by the corporation, the value of having a suite of large rooms which can be thrown open is important, and for this purpose the mayor's parlour should be pleasantly situated, and be in the main front, as it will often be required to serve as a reception-room or other purpose. Then if the banqueting-hall can be arranged as part of the council-room and committee-room suite in the main fronts, and in connection with the grand staircase, every requisite for a semi-state reception is found, the kitchen being on the top floor, and made

accessible by a lift to a small service-room. We have also the possibilities presented by these arrangements of an architectural *coup de main*, such as we find in Mr. Mountford's Sheffield Municipal Buildings, where the dining-room, reception-room, and mayor's parlour are placed *en suite* in the main front, with wide corridor approach; and in a more conspicuous manner in Mr. Hare's able design for the same building, with its arched loggia towards the street (see "B.N.," July 4, 1890). As to the approach to such a suite of rooms, it is better to have a spacious landing than a corridor, unless the latter can be made very wide, so as to form a useful crush-room. In the Oxford Municipal Buildings we observe a similar disposition of the assembly-room, ante, and committee-room; and Mr. McConnel, in his Walsall Town Hall, shows an effective distribution of rooms in connection with each other at the angle of his main fronts; the town-clerk being in the angle, and a committee-room on each side opening into it. The site in this case is triangular. For effective architectural arrangement of these rooms the principal staircase should be made a central feature with the main apartment, and for a like purpose it is better to throw space into ante-rooms or lobbies than into long corridors. Where there is no assembly-hall, the council-chamber, mayor's reception-room, and his parlour with one committee-room will make a handsome suite of rooms. In the selected design for the Darlington Town Hall by Messrs. Clark and Moscrop, such a group of apartments were provided; the mayor's parlour, with an ante-room, forming the central apartment opposite the main staircase. On public or semi-state occasions, the ante-room and parlour can be made a reception-room. We think this public aspect of the chief rooms is important, and should receive more attention than it generally does. We see too much of the tentative try-it-and-take-your-chance plan, in which the relation of one room to another is lost sight of. The mayor's parlour is placed anywhere in front, instead of communicating, as it ought to do, with the town-clerk's private office; it is not even a pleasant room. The council-chamber and committee-rooms are put in positions which are noisy and prominent, whereas councilmen and members of committees always prefer them in quiet parts of the building, where their deliberations are not interrupted by noise or distractions of the street.

The least knowledge of the requirements of public offices would prevent such blunders being committed. The constant consultations between the mayor and town-clerk, and the legal advice the former requires at almost every step; the absolute necessity of separating as far as possible the public portion or inquiry offices from the administrative functions and departments, are points which ought to be kept in view. Too often a cause of complaint is that the clerk's office of a given department is some distance from the principal's room, which may perchance be on the next floor. This involves a great deal of delay in business and answering questions; the clerk has to walk a long corridor or ascend a flight to see his principal, and time is wasted. To avoid this, the public office of each department should be as near the main entrance-hall as possible, and be also in communication directly with the private office of the official. The public access to the council chamber or public hall is often one of the most unsatisfactory parts of a plan. No separate entrance to them is provided for the use of the public apart from the official or business entrance, and when anything of a public nature is being transacted or a great meeting takes place, the ordinary approaches and exits are rendered impassable. Mr. Hare spoke of a distinct entrance and staircase from the street to the gallery of council-chamber—a very necessary access, and one that should be direct as possible; and he also dwelt on the size of the council-chamber,

and the mode of arranging the seats so that the members should be as much as possible concentrated, and that each member should have the large majority of the other members in front of him, and for this purpose two rows or tiers of benches are recommended. Under favourable circumstances, for large chambers, the semicircular arrangement of seats is probably the best. That the entrances and exits are best placed in a line, with the gangways so as to avoid disturbance when a member leaves or enters the chamber, is not always a safe rule, as very often the entrances are so placed at the opposite sides as to cause distraction to the other members and to the chairman, who usually occupies a central position in the diameter of the curve. He should have his own door. If possible, the entrances should be cut off by a wooden screen forming an ante-room. A minimum allowance for seats is given as 4ft. from back to back, allowing 2ft. in width for each member. If in tiers or rows, the back seat should be raised at least 6in. above the seat in front. For personal comfort, the movable chair system has undoubtedly advantage over the fixed benches. Any fixed rules are, however, undesirable as to the plan and seating of these rooms; but it is necessary that their size and proportions should be determined by the average number of the council, and the same principle ought to be considered in the size of the committee-room, and the large hall, if there is one. For this purpose it is necessary to fix a seating or standing unit, and to set out the number before deciding on the proportion of the room.

Many of our municipal buildings are spoiled by the narrowness and height of the corridors, as well as by their bad lighting. The suggestion of a vaulted ceiling, or a false and lower ceiling, to take off the excessive height is very necessary to be observed, though few architects appear to consider the matter. The question of entrances—whether the official and public entrances should not be separate in all large buildings; whether the public approach to the great hall should not be separate from the main staircase; the provision of separate entrances for the medical and sanitary departments—are points about which little was said. For large, mixed public buildings, there is no question as to the value of providing a distinct staircase and corridor from that used on state occasions; and the principle is a sound one that, generally, it is better to divide the public from the official and semi-state entrances.

A good deal was said in the discussion about questions of construction, fittings, sanitary arrangements, and acoustics, which it is unnecessary to discuss here, as they are matters more of detail than architectural planning. Acoustical considerations have a bearing on the proportion and shape of the council-chamber and public hall—the latter especially—and more attention ought to be given to insure a proportion of length, breadth, and height that is favourable to the transmission of sound, though the principles that can be safely adopted are very few, and often clash with other rules which have a stronger claim upon the architect. As the president said, the science had not reached so very definite a stage as to make it quite safe to follow in every case.

Little was broached on the architectural treatment of a town hall. That it should be dignified and, as far as possible, symmetrical in its main front is generally admitted. Very many of the designs sent in for this class of building are devoid of that official and public character which ought always to be attained. Where a public hall is included in the main building, a difficulty always arises as to its treatment. Should it be made a prominent feature, or be subordinated to the general design? To decide this question is not so easy as may be imagined. The circumstances of the site, the surroundings, and other



matters can alone determine the question, though where the hall has to be placed on one side, there is no other alternative than to give it prominence.

#### EXEMPTED BUILDINGS.

**M**ISUNDERSTANDINGS are frequently arising as to the exemptions from the operations of the London Building Act, section 201. Many builders and owners of property think that these exemptions apply not only to everything relating to the construction, to the thickness of walls, to openings, timber, height of buildings, roofs, floors, and other matters, but to the whole Act. But they are wrong. The Act clearly states that certain buildings and works shall be exempt from operations of Parts VI. and VII. of the Act, all other parts being in operation. Those two particular parts relate to the construction of buildings and to special and temporary buildings and wooden structures. It is imagined, for instance, that an exempted building is free from all interference as to lines of frontage, height, and open space; that the surveyor has no business with it, notwithstanding that section 138 expressly says that "every work done to, in, or upon a building," shall be subject to the supervision of the district surveyor subject to the exemptions. We may anticipate some confusion arising under this clause in future. Does it include every sort of internal structure, or those only regulated by the provisions of the Act? Probably there is one exception to the force of the section—namely, where any building work is erected in accordance with any special statutory authority. Be this as it may, it may be presumed that nothing is exempt from the district surveyor's supervision, because before any work can claim to be exempted it must come within the purview of the surveyor, who has to determine whether it is or not in the class of exempted buildings mentioned in the Act. It is certainly not very clear whether a building notice must be served under Section 145 in respect of an exempted building. Whether there is an implied exemption from the operation of part XIII. is a point we are not in a position to decide. Probably it will before long be brought before a competent authority whether a surveyor can enter or inspect every building of this class which is not, as far as its construction is concerned, under the Council's control.

Referring for a few moments to the buildings which are exempted under this section, and which more directly concern building owners and architects, we may mention under sub-section 10 "buildings not exceeding in area 30sq.ft. and not exceeding 5ft. above level of ground to the under side of eaves or roof-plate," and distant at least 5ft. from any other building and from any street, and not having therein any stove, flue, fireplace, hot-air pipe, &c., for warming, &c.—that is, a low shanty or shed having a space all round of 5ft., and 5ft. from the street, and not exceeding the area of a shed, say 5ft. by 6ft., or 30sq.ft., would come under this definition. The next subsection refers to buildings not exceeding in extent 125,000c.ft., not being public buildings, wholly in one occupation, and distant at least 8ft. from the nearest street or way, and at least 30ft. from the nearest building or land of adjoining owner. "A detached dwelling-house is not excluded from this exemption solely by reason of its being within 30ft. of another detached building used as stables or offices in connection with it." The next clause refers to buildings not exceeding 250,000c.ft. (not being public), and distant at least 30ft. from the nearest street or way, and at least 60ft. from the nearest building land of any adjoining owner. Again, this description applies to a

detached dwelling-house under a similar restriction to the last. Now, in both these cases we have a building of certain size surrounded on three sides by a free and open space of 30ft. or 60ft. respectively, and setback 8ft. or 30ft. from the street. We can hardly mistake the meaning of these subsections; but the subsections (14) and (15) relating to greenhouses are not so obvious, and may give rise to misunderstandings. Clause 14 says: "Greenhouses if not attached to other buildings" are exempt; but, according to this very scant description, a building owner may put up a wooden greenhouse within an inch or so of his neighbour's house or fence. What a risk in case a fire breaks out in the greenhouse! As most greenhouses are of wooden sashes and glass, and are usually put up close to the boundary of another building, the risks of fire are considerable. Mr. Ellis Marsland, in a paper read before the Society of Architects, has noticed the weak points of the section as it stands, and referred to the case of a builder who erected a greenhouse, 9ft. or 10ft. high, and 15ft. long, the back of which was of match-boarding, close to the boundary of an adjoining neighbour. Whilst there is no restriction as to distance of such a structure from an adjoining building or land, builders will be free to erect greenhouses wherever they like of flimsy and combustible materials like match-boarding. Surely a brick wall would be safer as a separation between the back of a greenhouse and an adjacent building. As the section stands it is in contravention of the section referring to wooden structures, which, under Sect. 84, no person is to set up without a license from the Council; but as this part of the Act is suspended in the case of exempted buildings, it would appear all the more necessary to introduce restrictions to safeguard the interest of adjoining owners. As a mode of communicating fire from one house to another, a wooden greenhouse is undoubtedly risky. Then there is no guarantee that such a structure may not be used for another purpose than rearing plants. Several cases have been brought before the police-courts where owners have contravened the 211th section. We lately reported two cases brought before the Lambeth court. One owner of premises at Peckham was summoned by Mr. Ellis Marsland, M.S.A., the district surveyor of Camberwell, for converting a greenhouse, which, when erected, was exempt from the operation of the Act, into a workshop and store. The structure was partly covered with corrugated iron, and two of the sides were boarded up. The defendant had used it for paint, turpentine, and wallpapers. In another instance, the same surveyor summoned an owner for converting a greenhouse into a billiard-room, and the offence being admitted, the defendant was fined. There are numerous instances in which attached greenhouses are used for lumber or storerooms and workshops which are not found out. Such cases only show the importance of making these structures as far as possible fire-resisting where they adjoin other buildings, or of placing them under certain restrictions. By exempting these structures altogether from the action of the law, there will be an inducement to erect them, and surreptitiously use them for other purposes. Unless Section 211 is vigilantly enforced, exempted buildings will become a snare, for it is only by insisting that they are used for a purpose which insures them the exemption, that the law will be of any effect.

#### COUNTY LUNATIC ASYLUMS.—XXXVIII.

By GEORGE H. BIBBY, F.R.I.B.A.

DISTRICT ASYLUMS ABROAD AND AT HOME.

**T**HERE are twenty-two district asylums in Ireland; these are equivalent to the county lunatic asylums in England as regards the class

for whom they are intended, and contain an insane population of a little more than 12,000 persons, these being about equal to the number of patients directly provided for by the County Council of London in its five asylums, but one-third less than the total number of lunatics chargeable to the parishes and unions within the London district. The number of patients in each Irish asylum is, however, much less than in London institutions, and varies from 326 patients at the Kilkenny Asylum, to 1,092 patients at the Cork Asylum, and to 1,467 at the Richmond Asylum near Dublin, the average number in each of the twenty-two asylums being about 500 patients; therefore, five district asylums, of the size of that at Claybury, near Woodford, would be capable of containing the whole of the Irish lunatics (exclusive of the lunatics and imbeciles in workhouses both in London and in Ireland).

From the architect's point of view it will be of interest to note that the increase of lunacy in Ireland has been such that at least six new asylums should have been erected there since the year 1882 (at 500 patients per asylum), and that since 1882 the estimated population of Ireland has dwindled from about five millions to rather more than four millions.

During the same period the population of London has greatly increased, with an increase of lunatics also, and ten or twelve new asylums (if for only 500 patients as in Ireland) should have been erected, or, say, about five asylums of the size of that at Claybury, which, although only erected for 2,000 patients, was found to be sufficiently spacious (according to official regulations) to contain the 2,320 patients now housed therein.

The recovery rate at the Claybury Asylum has already become a noticeable feature of this, the last erected asylum for the County of London, and doubtless one of the reasons for this is that the arrangements and brightness of the institution have a beneficial effect, not only upon the patients, but upon the officials and attendants, who are thus better able to bear up against the frequently arduous duties expected of them and the depressing effect of contact with certain classes of patients. In a new asylum many inexperienced attendants have frequently to be engaged, and hence the resignations of large numbers of young persons who find themselves unsuitable for the work, or are discharged as being incompetent to take care of the patients.

The Claybury Asylum, although an enormous institution, is yet so well planned, that the numerous erections of which it is composed are not crowded, and there are ample courtyards and spaces which provide for the free access of light and air at every point; and one great advantage of the arrangement is that the wards are of moderate size and numerous, thus securing the subdivision of the patients to a greater extent than in those asylums where the wards are of great size, and increasing the opportunities for the recovery of many classes of patients. There is in this asylum a remarkably fine recreation-hall, with a stage for concerts and theatricals; here the windows are in stained glass, representing the armorial bearings of the numerous parishes associated with the purposes of the asylum.

The magnitude of this asylum is so great that the main buildings alone cover 20 acres of the 270 acres forming the estate belonging to it; 27 millions of bricks, 12 acres of slating, and 13 acres of flooring were required for its construction; there are 2,000 doors, 4,700 windows, 11 miles of sewerage, and 22 miles of pipes, &c. The site is considerably higher than most other parts of Essex, and I have been surprised to obtain distinct views of the asylum from the neighbourhood of Havering-atte-Bower, Toot-hill, near Ongar, and other distant localities. The estate is remarkably beautiful and exceedingly well wooded; in fact, it was rather too much so, as it became necessary to make some clearings of timber for the purpose of obtaining light, air, and prospect for the inmates of the institution.

The site is upon, or adjacent to, land forming part of the ancient forest of Hainault, and the clay soil upon which the asylum is erected is of a somewhat spongy and treacherous nature. Being very considerably elevated above the surrounding district, the necessity for securing an ample water supply for all contingencies has obviously required careful consideration. In connection with some asylum schemes the architects have under such circumstances placed a water-tower (frequently



near the centre of the buildings), supplied either from a waterworks company's main, or by pumps from other available sources. In these towers the tanks are placed as high as conveniently may be arranged, and it has occasionally been contrived that the lower portion of the tank should be reserved for fire-hydrants only, no supply for any other purpose being taken except from a point 4ft. or 5ft. above the bottom of the tank. Thus, should the supply for domestic purposes at any time fail, it would at once be indicated to the asylum engineers that no more water remained in the tanks than might be required for the extinction of an outbreak of fire. By this means the fire-pipes and hydrants would always be charged. Not unfrequently, a centre shaft to convey smoke from the boiler furnaces is arranged; but it would appear to be desirable that the water-tower and chimney-shaft should be as widely apart as can be arranged, or otherwise, during certain directions of the wind, smoke and gases might be forced (through the ventilators) upon the surface of the water in the tanks. Much smoke may remain in the shelter of the shaft, and be drawn in above the water in a direction opposite to the course of the wind, partly by reason of a somewhat higher temperature of the atmosphere within the water-tower, and partly as a result of the ever-varying directions of the wind.

In no other class of buildings than county or district asylums can be found so great a variation in the number of cubic feet considered by architects as necessary for buildings to contain a given number of patients. For instance, in a limited competition of architects for an asylum for 2,000 patients, architect A. gave a schedule of cubic contents amounting to about sixteen millions of cubic feet, while architect B. gave a schedule with a total of less than nine millions. Architect A. stated that he estimated the total cost of this asylum for 2,000 patients at £152 11s. 9d. per patient, or £305,939 1s. 8½d.; but architect B. considered that the institution might be erected for £143 per patient, and that the cost altogether would be £290,000. Both these architects have had an exceptionally great experience upon large asylum works, and the above variations were subjects for surprise. The asylum-church designed by architect A. was estimated to cost £3,750, while the church planned for this asylum by architect B. (who was lower in his estimates in most other respects) was no less than £8,500. As a matter of fact, had the estimates of architects A. and B. been added together, the result would not have been less than the ascertained actual cost. Another curious point in reference to these estimates is, that architect A. cubed out the various asylum buildings at from 3½d. to 6d. per cubic foot, while architect B. gave from 4½d. to 8d. as his cubing prices, and yet the total estimate of the latter was lower than that of the former.

These considerable variations in the estimated cost and cubic contents of buildings intended for corresponding numbers of patients and attendants are by no means confined to recent periods; for instance, there was some years ago a competition between specialist architects who sent in plans for an asylum for pauper lunatics for the county of Northampton, when the then architects to the commissioners in lunacy reported in reference to a scheme (submitted by the late Mr. Robert Griffiths, county surveyor of Stafford), subsequently carried into execution, that they "found it to be the most compact and convenient in disposition, affording the greatest facility for independent access and circulation throughout the whole group, and presenting the largest surface to those portions of the building occupied by patients to the most favourable aspect and to the most uninterrupted views of the adjacent country. This design does not attempt any ambitious or costly architectural character out of keeping with the purposes for which the building is intended: it avoids unnecessary expense in its construction; the height or pitch of the roofs is moderate, sufficient for all purposes of protection and durability; whereas if, for the mere sake of effect, it were carried higher, the cost of timbering and slating would be proportionately greater."

The then architects to the commissioners stated that Mr. Griffiths had evidently in this design availed himself of the experience he had gained elsewhere, and that he estimated the cost of the building at 5d. per cubic foot, complete, and also expressed their belief that this estimate, although based on a higher rate per cubic foot than that of any of the other competitors, would not be found



THE THEATRE, ST. BRIEUC, BRITTANY.

more than sufficient for the really substantial and complete finishing of this asylum fit for the occupation of the patients, exclusive of furniture; the prices at which the competitors estimated the cost of the proposed asylum at Northampton were 3½d., 4d., 4½d., and 5d. (Mr. Griffiths alone assuming the last price), the cubic contents varying from 1,212,851ft. to 2,781,491ft., or an average of 2,172,400ft., Mr. Griffiths's quantity being only 2,038,376ft., or somewhat below the average.

From the report above referred to it was clearly expressed that the competitors were of known ability and experience in buildings intended for the care of the insane, and that much ingenuity, care, and skill had been shown in all the designs sent in, and it may be assumed, therefore, that the differences in cubic contents and prices per cube foot can be accounted for by the different competitors entertaining, on the one hand, too liberal views as to what is requisite for pauper lunatics, or, on the other hand, they may have unduly considered what may, in their opinion, have been best for the ratepayers' interests.

The late Mr. Robert Griffiths had for about 25 years (from 1860) made asylum construction his chief study, and I believe that I am correct in stating that he had as much experience in the building and alterations of county asylums as any other member of his profession. The Cheshire Asylum, which by competent authorities was at the time pronounced to be the best in the kingdom, is planned on the block or pavilion system, consisting of a series of separate asylums connected by ground-floor corridors and single rooms. No doubt this arrangement is good, but the cost is very great, and the corridors, as in the Echelon system, unduly long. Mr. Griffiths, in his design for the Claybury Asylum, combined the block or pavilion with the corridor system, by which he claimed that the cost would be very materially reduced, and the facilities for working the asylum increased by proper classification, sub-division, and general arrangement.

He also built the asylum for the county and city of Hereford, the plans for which were at the time considered so excellent that they were published by order of the Commissioners in Lunacy; he also erected the asylum for the county of Northampton, as a result of the competition with other specialists, and was engaged upon alterations and additions at other asylums. The remuneration he received as a result of his extensive asylum practice appears to have been, to a considerable extent, expended upon the purchase of pictures and other works of art by the leading artists of the day, and at the time of his death (some seven or eight years since) he possessed a collection which had, I believe, cost him something near to £80,000, and which were partly housed in a kind of drawing-room gallery connected with his residence by a short corridor;

and I well recollect Mr. Griffiths directing my attention to two or three pictures which had, he said, cost him more than the whole amount of the architect's commission paid to him in respect of a large asylum, and saying that if he won a then pending asylum competition, that the architect's commission (not less than £15,000) would in all probability be similarly disposed of.

That a few yards of painted canvas, however rare and beautiful, should be considered as an equivalent for the labours of a skilled architect and engineer during a period of four or five years (when united with the varied responsibilities and anxieties of a great contract), cannot but offer a theme for thoughtful consideration both for artist and architect, to whatever eminence either may have attained; but in these days wealth and New Year's honours more frequently fall to the lot of the great artist than to the eminent architect.

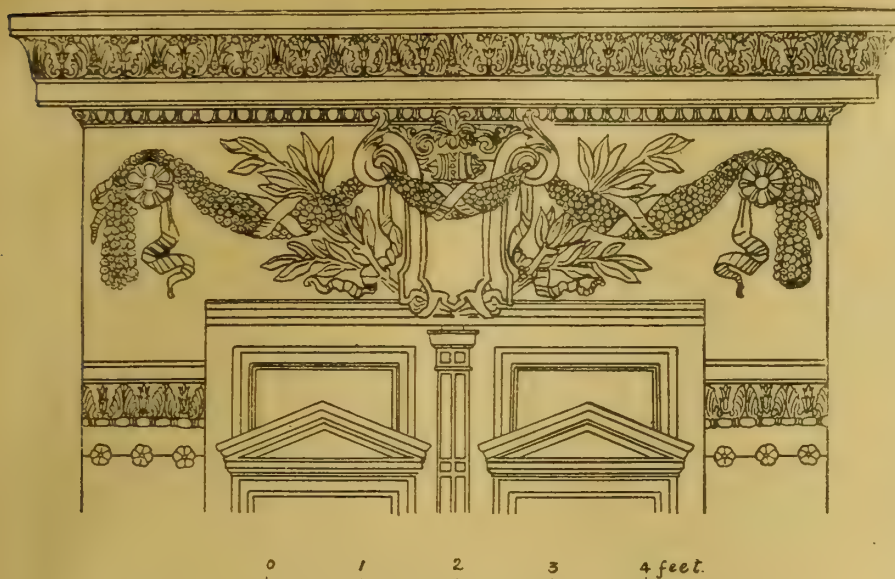
Probably architects of asylums might be better able to make advances and improvements in asylum planning were they not somewhat hampered by the restrictions of the Commissioners-in-Lunacy.

It has been proposed that the Lunacy Commission should be abolished, and a recent writer states: "As at present constituted, it is absolutely inert and inadequate; the public has been so completely misinformed upon this subject, has been lulled to such deep sleep by pretentious blue-books, that it will refuse to believe that the Lunacy Commission is ridiculously inadequate to fulfil the purpose for which it was designed, and is a monstrous anomaly in these days of common-sense legislation and liberal decentralisation." Again: the same writer says: "It is known to everyone interested in asylums that the Commissioners have about a dozen 'fads' in common, and each has one or two of his own, and all that is necessary is to play up to these. These fads appear in every report as recommendations, and are repeated in some reports year after year." In place of the existing system, it has been proposed that the country should be divided into districts, in each of which inspectors should reside, and that there should be medical men in such numbers that they may be able to obtain a personal knowledge of every lunatic in their district, and that the present commissioners being disestablished, the funds now appropriated for their support be applied to the payment of the new district inspectors.

Under such a scheme a surveyor of asylums would be required for each district, or group of districts, whose duties would include the examination and approval of all plans for new asylums, and who might either devote the whole of his time to such work, or, with some restrictions, be allowed private practice. The existing arrangements are almost hopelessly rigid, and appear to militate against asylum improvements medically, legally, and architecturally.

(To be continued.)





DETAIL OF ENTRANCE DOOR BETWEEN TWO SHOPS, PARIS.

(From CESAR DALY.)

CLASSIC DETAILS AND THEIR APPLICATION.\*

By G. A. T. MIDDLETON.

XXV.—MODERN RENAISSANCE: SMALL CONTINENTAL BUILDINGS.

IN France, and upon the Continent generally, the smaller Renaissance buildings, in general character and detail alike, may be said to ape the more monumental; and the reason is not far to seek. It lies, as does that of the whole character

buildings generally. Thus it happens that success in the provinces can only be looked for in the larger houses, hotels, and semi-public buildings; the theatre at Briec, which is illustrated here, being a fair sample of what one might expect to find. Without being particularly striking, it is of good taste, and evidently designed with considerable thought. The main centre portion in particular is well marked, and the wide spacing of the columns is strengthened by coupling at the angles without squeezing the

particular design, and not characteristic of French architecture generally. Much more censurable is the use of a severe style at all in the position which the building occupies, for it is utterly out of harmony with its surroundings. Still, trained in one groove, French architects can scarcely be expected to depart from it.

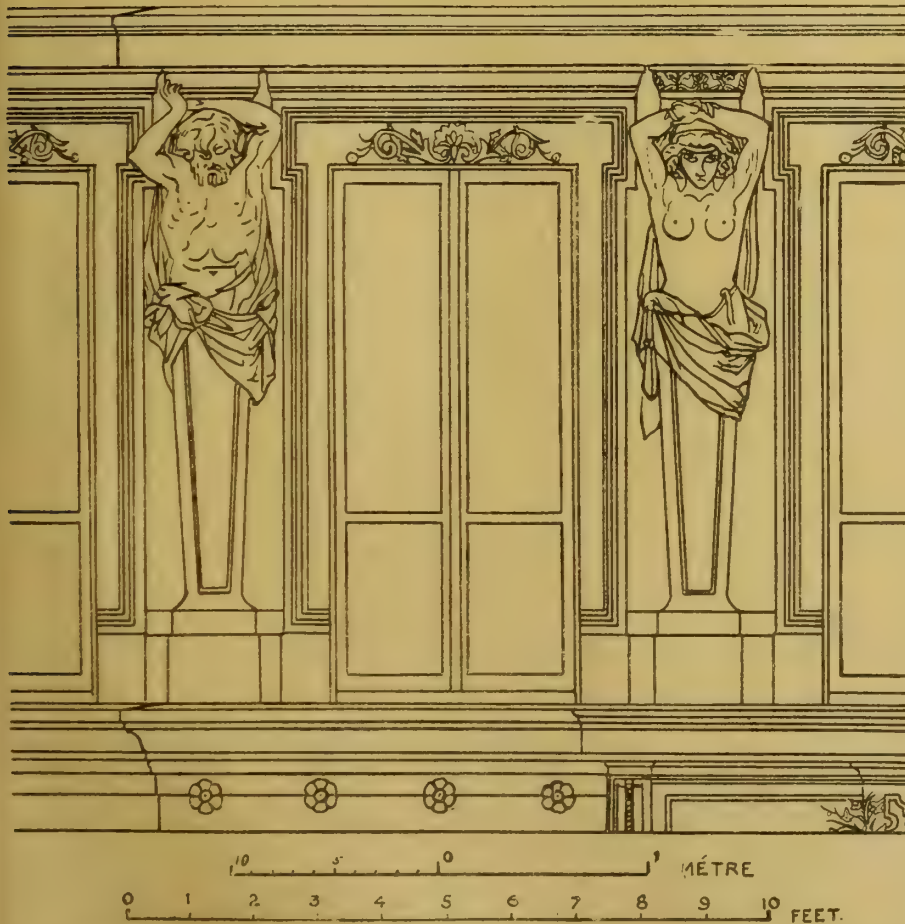
The evidence of academical or school training, as opposed to that obtained by the study of old works, or in a practical working office, is even more apparent in the smaller details, which, though frequently of great beauty, are commonly wanting in the constructional quality. Two very different but equally characteristic examples have been selected for illustration. In each, the demands of the material, presumably stone, which was to be employed, have met with little consideration, for the cost of carving where there is so much raised ornament would be quite out of the question, except in works of the first magnitude, and consequently the material had to be adapted to the design, and the means available, and plaster was necessarily resorted to. The small scale is also noticeable, and ornament which would look admirable if double the size, at once becomes insignificant in the one case, and overbearing in the other. The free and original character of the decoration does not atone for this, but rather accentuates it. The spirit of the swags and foliage, and the beauty of the acanthus ornament to the doorway, together with the well-devised cornice section, are admirable in themselves; but the effect is spoilt by too great eccentricity of application of these details, and especially by the doorway cutting through the moulding (query: Is it the architrave?) below the deep frieze.

It is difficult, perhaps impossible, to look upon the modern work, whether of England or of another country, in an unprejudiced spirit, and these remarks must consequently be taken with reservation; but after considering in these articles the characteristics of Classic details in all previous times, there certainly seems to be a want of fitness in most of the lesser Continental work, combined often with delicacy, sometimes with boldness, of general conception, as well as with great conception of beauty of form in surface decoration and enrichment.

THE REAPPORTIONMENT OF RATES AND TAXES.

AT the ordinary general meeting of the Surveyors' Institution, held at 12, Great George-street, on Monday evening last, a paper was read on the above subject by Colonel G. W. Raikes, F.S.I. The President, Mr. Daniel Watney, occupied the chair.

The author began by expressing an opinion that the present was an opportune time for dealing with the public burdens of the country, commonly known as rates and taxes, and for introducing some great and comprehensive measure for equalising them. Many interests, and more especially the agricultural interest, now in such a severe phase of depression, called aloud for some readjustment of the loads under which it groaned. Everyone knew the straits in which those who got their living from the land now were. Reductions of rent had so impoverished landlords that they were in many cases unable to do repairs, or even to live on their own estates, their houses being let to strangers who had no interest in the locality. The tenant farmers were in almost a worse condition; their savings and capital gone, their reserves used up. The labourers, perhaps, suffered less, for the very cheapness which ruined their employers benefited them. Notwithstanding this lamentable condition of affairs, it was a fact, the author said, that the owners and tillers of the soil are compelled to provide almost the whole of the poor rate, and not only to support paupers and lunatics, but to pay for the police and all other expenditure of local taxation. Land, on account of its greatly reduced value, did not, it was true, bear so much of this burden as other real property, but the proportion of nearly one-fourth which it did bear was most unfair. The simple reason was that any occupier of land, whether as owner or tenant, or any tithe owner, was rated on the estimated annual value of the land or tithe, as well as on his house and premises, whereas, with few exceptions, all other householders were rated on the value of their house and premises only, and thus the vast wealth of the country was untouched for local rates. Moreover, not only had landlords to pay income-tax under Schedule A



DETAIL OF FIRST FLOOR OF A HOUSE IN PARIS.—(From CESAR DALY.)

of the architecture, in the domination of the Parisian Ecole des Beaux Arts, where the training is almost entirely towards that which is great, to the neglect of the everyday house and domestic

couples too closely together. Possibly the frieze of the main order would have been better left plain all through, and the variations in width of the modillions which enrich it over the centre is only noticeable as introducing a feature of unrest; but these are only small idiosyncrasies of this

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with a totally inadequate deduction for working expenses, but tenants, unless exempt by the smallness of their income, paid again 3d. in the £ for the same land under Schedule B. The author said he had not time to deal with land-tax (which, however, he thought redeemable on more favourable terms) or tithe, which presented a more difficult problem. A charge which pressed heavily on the land was that for free education. It appeared from the Local Taxation returns that the total amount raised in poor rates in England and Wales during the year 1893-4 was 17½ millions, or an average of 2s. 3½d. in the £ of rateable value. The lowest poor rates were in Westmoreland (10½d.), Northumberland (1s. 2½d.), while the highest were Essex (3s. 1½d.) and London (2s. 11½d.). This enormous amount, although collected as poor rates, is not all expended on the relief of the poor. The proportionate expenditure for the year named was:—Relief of the poor, about 9½ millions; partly connected with relief of poor, £800,000; totally unconnected with relief of poor, 10 millions. The maintenance of the poor in England and Wales would appear to cost 10½ millions, and other local expenditure 10½ millions. The income to meet this expenditure of 20½ millions was:—Derived from poor rates, 17½ millions; sundry receipts and grants in aid, 2½ millions; grants in aid, in part for poor, £11,000; grants unconnected with poor, £18,700. The deficit of some £300,000 was probably provided out of cash balances to the credit of various unions. During the same period, the net amount of property chargeable with income-tax under Schedule A was 156 millions, which practically coincides with the 159 millions the rateable value of real property. The net amount chargeable under schedules C, D, and E, which represents the amount of income from all sources other than real property, was nearly 340 millions, or more than double the income from real property; but this, instead of paying as it should two-thirds of the cost of the maintenance of the poor, only paid a little more than a million and a quarter. Thus, real property paid something like four-fifths of the whole; while, if the whole sum were raised by income-tax, it would only pay one-third. It was clear, the author said, without going into the origin of the poor laws, that the present incidence of local taxation on land was unjust, and the question arose, What was to be done to redress the injustice? Speaking generally, the only fair system of taxation was one by which the whole wealth of the nation contributed to provide the income which the nation required for Imperial purposes, which was not provided for by excise, customs, stamps, and such things. If the maintenance of the poor is a national burden, then, said the author, the nation ought to bear it. The principle being granted that national wealth should bear national expenditure, it was equally clear that local wealth should bear local expenditure, and there was no better test of an individual's capacity to contribute than the value of the house he occupied. It had before now been proposed to give up the inhabited house duty for local purposes, and why not? Let the Imperial Exchequer take back the extra beer and spirit duty now handed over for local purposes, and hand to the local authorities the inhabited house duty, not as sufficient to meet all requirements, but as a measure or basis on which to found the local taxation of the country. It would be a simple problem for every householder to solve for himself what would be the result to him for an additional 4d. income-tax and a house rate of, say, 1s. 6d. to 2s. 6d. in place of the old poor rate and house duty together. To the tenant farmer the relief would be very marked. The landowner would get practically no benefit, the country clergyman would very considerably benefit. The wealthy tenant of a country mansion would pay about a quarter more. The small landowner and the village tradesman would both gain. Colonel Raikes gave elaborate and ingenious tables to prove the soundness of these conclusions and arguments, which space does not permit us to reproduce here; but the gist of all his suggestions was, that by the substitution of an income-tax and a house-tax for the present poor rate, highway rate, and house duty, as well as income-tax in some cases, everyone would be benefited whose living was derived, directly or indirectly, from the land, and that the only persons who would pay more were those who, with ample unearned means, could well afford to do so.

A discussion followed, in which Mr. Castle, Q.C., Mr. Smyth, Mr. E. P. Squarey (past

president), Mr. H. A. Rigg, Mr. Howard Martin, Mr. G. Beken, and the President took part, and after a brief reply by the author the meeting adjourned.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XIV.

By JOSEPH HORNER.

AMONG the work subject mainly to compressive stress for which cast iron is a suitable material are the screw piles used for the foundation of piers and of bridges. The screws are cast in the lowest section of the pile. This is driven into the strata by means of worm-gear, and successive sections of tube are bolted on as the pile descends. In piles of small diameter the belt flanges are outside; in large ones they are inside, as in ordinary foundation cylinders. There is practically no risk incurred in using cast iron for these purposes. Occasionally a screw pile

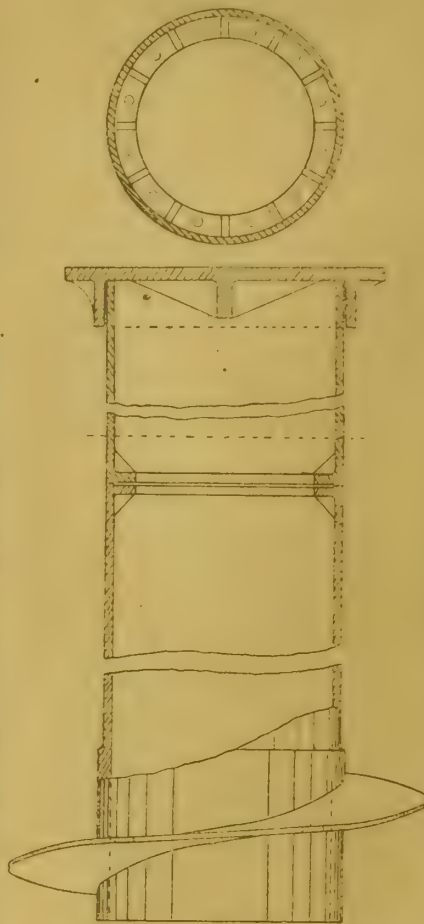


FIG. 53.

fractures while being screwed into an exceptionally hard bed. But that need seldom occur, and can be largely guarded against by giving ample strength to resist torsion. Such is also the case with foundation cylinders. When these are filled with concrete, there seems no reason why they should not endure for centuries, removed as they are from atmospheric influences.

Fig. 53 is a pile screw of large diameter, suitable for bridge piers; Fig. 54, one of small diameter, for light piers or landing-stages. A pile cap, shown in Fig. 53, surmounts the top length to take the main girders. A foundation cylinder is shown in Fig. 55. These are superimposed and bolted together with cement joints, and filled with concrete, so forming one substantial mass. These are then solid columns.

There is nothing so desirable as a column of stone. But an iron column of large dimensions built up in successive lengths with internal flanges, so as to be flush on the outside, can be constructed much more cheaply, and should last for centuries. Columns of a similar kind as those used for the central piers of bridges are employed also for gas-holders, for roofs, and structures of similar character.

In one respect cylinders of cast iron are much superior to wrought-iron cylinders for the central

piers of bridges, that namely of durability. The wrought-iron cylinders have the advantage, it is true, of diminished cost for transit, which is a matter for serious consideration in much foreign work. But the cast iron being much thicker than the wrought, is better calculated to withstand corrosion.

It is well known that columns which are short



FIG. 54.

relatively to diameter are subject to little, and in some cases no, cross-breaking stresses, but to compression simply. In columns which are very long, compressive stresses cannot be safely calculated on as coming into play in any degree, but the cross-breaking stress alone can be considered. It is true that if a long column is cast straight, well flanged and bracketed, and securely fixed, its resisting power may be equivalent to the compressive stress acting down its vertical axis. But such is never calculated on, because of the tendency to bend, which brings the cross-breaking stresses into play. For these reasons the aim always is to make columns of as large diameter in relation to length as possible. And it is for this reason that columns are made hollow, in order to increase the diameter without increasing weight. The metal is simply taken from the neutral axis, and its vicinity, and massed in the form of a tube. The principle is also carried still farther in many

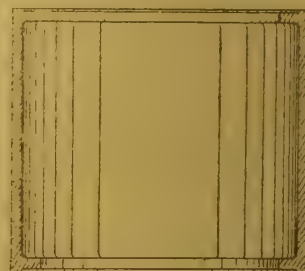


FIG. 55.

central piers, a series of columns of small diameter being arranged in the form of a circle or polygon, in plan, and braced to each other by means of rods.

The common buckle-plate, Fig. 56, which supports footways over bridges, is well designed to withstand compressive stress. If such plates are well cast of tough metal, and are of approximately equal thickness all over, the joints planed, bolted, and cemented, they seldom fracture. It is essential that the metal be of good quality, tough, and deflecting well in the test-bar. The poor quality of metal which it too frequently put



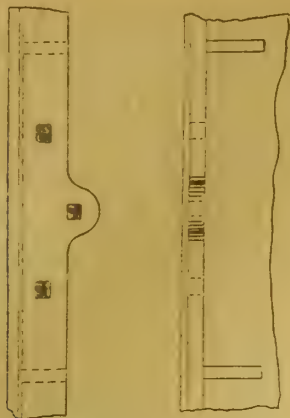


Fig. 57.

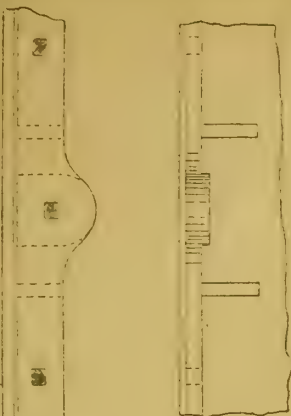


Fig. 58.

into tank-plates is quite unsuitable for buckle-plates, which are subject to considerable vibration under heavy traffic.

Cantilevers for supporting railings, and also sometimes narrow footways, are made in cast iron preferably to being built up of wrought-iron bars and angles. They are subject to a bending stress compounded of tension and compression, being in principle beams fixed at one end, unsupported at the other, and uniformly loaded. Cantilevers, if properly made, can scarcely fail. In strictness they might be tapered outward, but this is not done since it is not consistent with good appearance. The bottom flange might be made of one-fifth or one-sixth of the sectional area of the top one. But it is not usual to make so great a difference, nor is it desirable. If made from one-third to one-half the area of the top flange, the cooling will be regular enough to insure a second casting. The vertical flange is often made wider than the top to give plenty of bolt area and metal round the bolts, the stress on

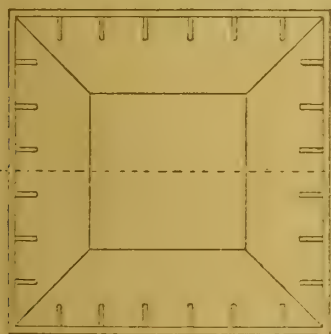


Fig. 56.

these being severe. Many cantilevers are made of hollow box-form instead of being ribbed, and ornamented besides with scroll-work, and then the strength of the bottom sections is vastly in excess of that of the top ones.

Though the use of cast iron in tension should always be avoided as far as possible, in some cases it is permissible, as, for instance, when there are several elements mutually supporting. Thus in cast-iron water-tanks the tie-rods which pass from side to side to retain the tanks from yielding to the pressure tending to force the sides apart are bolted to lugs cast upon the flanges, Figs. 57, 58. These are purely in tension; but there are several ties, and if one lug should yield, the others would still serve to retain the sides; but in such cases ample strength should always be given. Fig. 57 shows how a lug should not be made; it is too weak to be trusted. Fig. 58 shows a strong lug. It merges into the flange with large radii, and the thickness is increased by means of facing piece cast within the lug. This is an object-lesson for all lugs in tension.

In many instances when a portion of a casting would be subject to tension, it is better to make use of an attachment of wrought iron secured to

the main casting. In some columns the use of cast-iron lugs for bracing is often abandoned, and the lugs are formed of wrought-iron straps, which are made to encircle the column. Fig. 59 shows a bad arrangement; Fig. 60 shows the arrangement generally adopted. Belts A are cast round the column at the locality required, and a strap, B, of suitable substance is bent round and formed into lugs at the free ends, through which a bolt is passed to receive the end of the tie-rod C. The use of bolts is to confine the strap, and so prevent it from becoming pulled out of place by the stress of the tie-rods. To cast a lug or

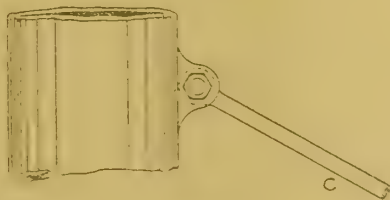


Fig. 59.

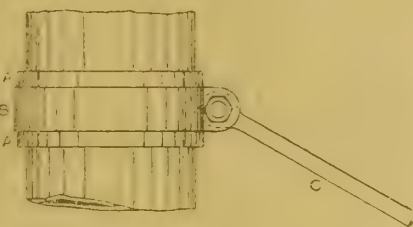


Fig. 60.

a plate on the column and belt wrought lugs to it would be no better than casting the lugs on; hence the reason for the adoption of the belt.

The pipe-making industry is a very important branch of work in cast iron. Unless in very exceptional instances, as in the case of pipes of very large dimensions, and in pipes for foreign transit, all water and gas-pipes are made of cast iron. So large is the demand, that there are several foundries in great Britain devoted almost wholly to the manufacture of these pipes. These foundries are equipped with numerous costly appliances, which reduce the work of making the pipes to that of a grade but slightly in advance of purely unskilled labour. The cost, therefore, is small by comparison with that of general engineers' castings. In no other material could pipes be constructed so cheaply. The only material which seem to threaten remotely cast iron in this kind of work is mild steel, which is used to a moderate extent for foreign orders. Pipes made of this are light and strong. But the joints are more readily made in cast iron than in these.

## CONCERT HALLS AND ASSEMBLY ROOMS.—X.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THERE are several large establishments to be found in German towns, which are built by subscriptions raised among the wealthy inhabitants of the town, for the entertainment and recreation of their fellow-citizens. These establishments are very complete in their arrangements, and are carried out on a large scale. The two examples which here illustrate this particular type of building are the Gesellschaftshaus "Harmonie" in Heilbronn, and the assembly-rooms in Köthen. Of the former, Fig. 1 gives the ground plan, and Fig. 2 the first-floor level. The architect was Mr. Rob. Reinhart, who erected the building between 1875 and 1877. The site is an isolated one, with the exception of the one end where the carriage-way A, Fig. 1, passes under

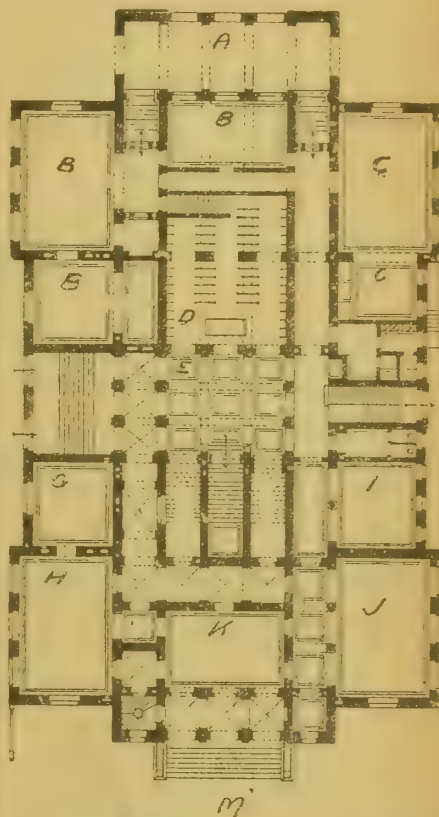


Fig. 1.—A, carriage-way; B B B, public refreshment-bars; C, rehearsal-room; D, cloak-room; E, vestibule; F, grand staircase; G, card-room; H, reception-room; J, billiard-room; K, saloon; L M, entrances.

the assembly-hall. The cost of the building, exclusive of the architect's fees, was £15,000, being £11 10s. per metre superficial, or 15s. per cubic metre. On the ground floor are public refreshment-rooms and a public-house, and rehearsal-room for the artists with stage, between which is placed the large cloak-room facing the central or grand vestibule. This vestibule is approached from the chief entrance used for the public visiting the assembly-halls on the first floor, and from it the grand staircase starts. The front portion of the ground floor is occupied by the rooms in connection with the club, reading-room, card-room, billiard-room, and reception-room. There are two halls on the first floor, the larger being 330 square metres, the smaller 150 square metres; they are most elaborately decorated with frescoes by the well-known artist, Herr Lesker. It is only necessary to examine the plan to see how complete the whole arrangements have been made so as to adapt this suite of assembly-rooms for all kinds of public meetings and receptions.

The assembly-rooms in the small provincial manufacturing town of Köthen are of a peculiarly German type. Like the former, they have been erected by subscription; but they not only cater for the wants of the inhabitants of the town, but also for those coming in from the surrounding country to entertainments at these rooms.

The ground plan (Fig. 3) shows that there is a long range of stables (A) for the accommodation



of the horses of those who come by road, and there are several guests' bedrooms (G) for those who are unable, for various reasons, to reach their home at reasonable hours. The architects

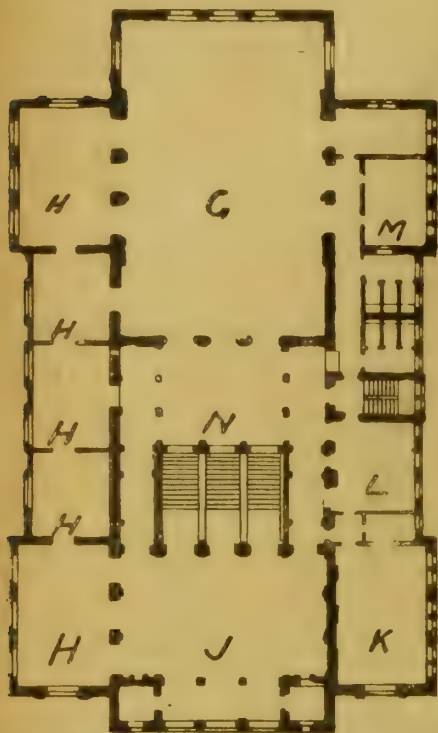


FIG. 2.—G, hall; H, reception or drawing-rooms; J, small hall; K, library; L, buffet; M, ladies' toilette-room; N, small hall.

of this building were Professor Ende and Bückmann; the former is the artist and the latter the business man of the firm. Their office is one of the largest in Berlin, as they employ some 40 to 50 assistants. Considering the position which the professor holds in the German architectural

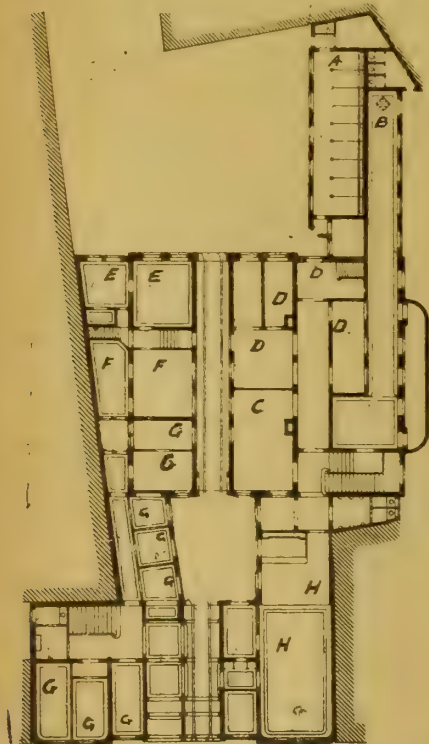


FIG. 3.—A, stables; B, bowling-alley; C, kitchen; D, service; E, caretaker; F, servants' quarters; G, guests' bedrooms; H, restaurant.

profession, that he has held the office of President of the Prussian Academy, only occupied by two architects since its foundation, that he is an honorary corresponding member of the R.I.B.A., and the *doyen* of the profession in Germany, it is

with wonder we English architects hear that the firm of which he is the head are architects and contractors combined, not only designing, but actually carrying out, their own work. We must, however, pass on to the consideration of the ground plan, Fig. 3. The site, an irregular one, was a very difficult one to deal with, and shows a great amount of skill in the way the rooms are grouped. The various requirements of this particular establishment were numerous, as I

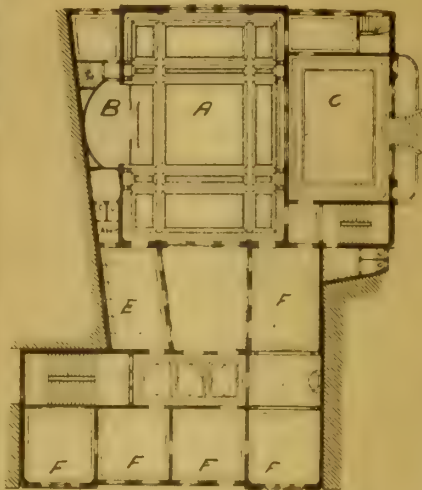


FIG. 4.—A, great hall; B, stage; C, card-room; D, dressing-room; E, cloak-room; F, club-rooms.

have said, not only the town folk, but the country people, had to be considered. A large kitchen and suite of rooms for the service was therefore necessary, as well as a public restaurant; a big staff of servants had to be accommodated, and a place found for a dwelling for the caretaker or manager, and all of these had to be so planned that they would not curtail the available space for the assembly-rooms themselves.

On the ground floor, therefore, are all these adjuncts, and a strange feature of this plan is that a carriageway goes right through the building from back to front, so that it is possible, after "putting down" the guests at the vestibule under cover, for the coachman to drive through to the stables in the rear.

The whole of the first floor (Fig. 4) is occupied by the extensive suite of apartments of the assembly-room proper. All sorts of entertain-

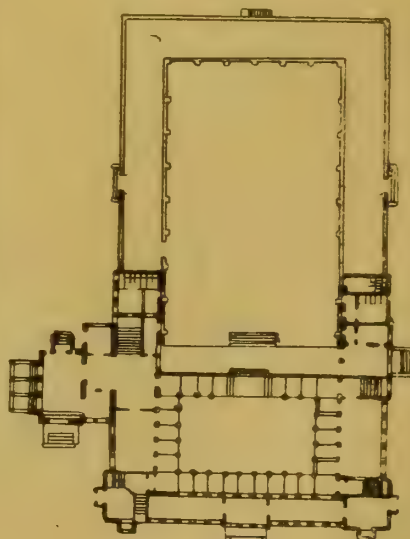


FIG. 5.

ments can be given here, as the great hall (A) is provided with a stage.

In Germany we find that there are buildings used for concert-rooms and assembly-halls in connection with botanical or zoological gardens, as well as with the large public parks; for instance, there is the institution known as the Flora Hall in Berlin, the Palm House in the Botanical Gardens in Frankfort, and the assembly

rooms in the Zoological Gardens of the same city. There are so many examples of this type of concert-room that it is difficult to choose the plans to illustrate them. However, in Figs. 5

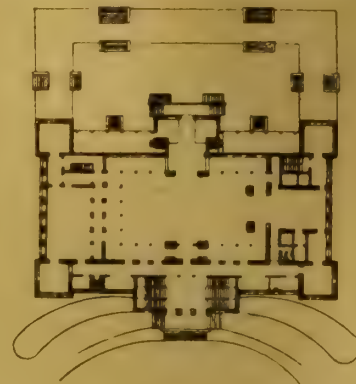


FIG. 6.

and 6, I have chosen plans which fairly set forth the class of building to be found in these cases.

In the Palace Gardens of Frankfort (Fig. 5) is built the Palm House Assembly Rooms, a large hall let off for all classes of public entertainment, with a huge palm-house at the back of it. The original building was erected by subscription, and the architects were Kayser and Thelemann. The hall was opened in 1870, the grounds were extended in 1875, and again in 1885; but the hall was destroyed by fire in 1876, and the one which forms the subject of the illustration was erected in its place by the architect, Herr Schmidt. The building is of some architectural pretensions, Italian Renaissance in style. The internal decorations are somewhat lavish, the segmental ceiling being painted with frescoes representing

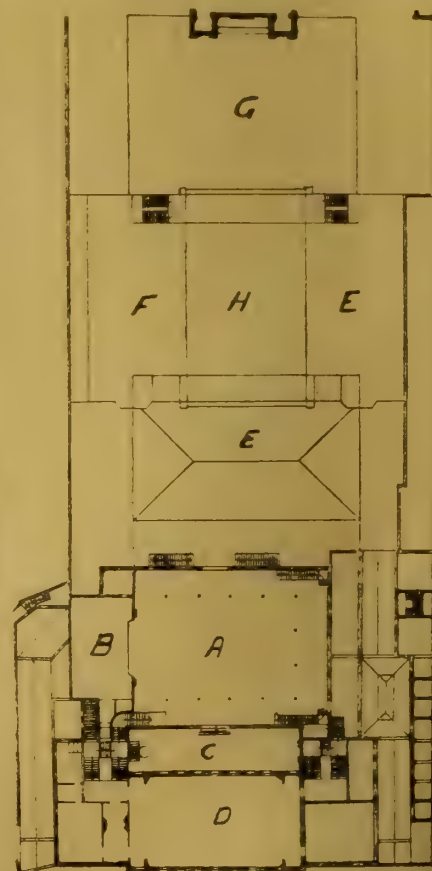


FIG. 7.—A, large hall; B, stage; C, foyer; D, small hall; E, winter garden; F, colonnades; G, foyer; H, open garden.

"the delights of eating and drinking," not a subject which would appeal to everyone as particularly dignified or appropriate for a large public hall. The palm-house is used for promenading and for refreshments.



In 1874, Professor Kayser was commissioned to erect the large concert-hall in the Zoological Gardens, he having won the competition for the designs of the building. Fig. 6 gives the plan, which shows that in addition to the large hall there is a small "symphony" hall for chamber music. In the rear of the building is a loggia and a large terrace in two tiers, from which a fine view of the lake can be obtained. These terraces are largely used in summer, being arranged with tables for the service of refreshments.

In all these plans it will be seen that the German never forgets to provide plenty of room where he can sit down and drink his beer, and it has even been suggested that the provisions of the bedrooms in these public establishments is partly necessitated on account of the after-effects of the liberal potions indulged in.

One of the largest assembly rooms of Leipzig is the Crystal Palace, which has an historical past. Erected originally by Schinkel, it has seen several fires, till finally the group illustrated in block plan, Fig. 8, was developed. In 1882 the front portion of the building was erected chiefly in iron and glass. In 1886 a large circus was added

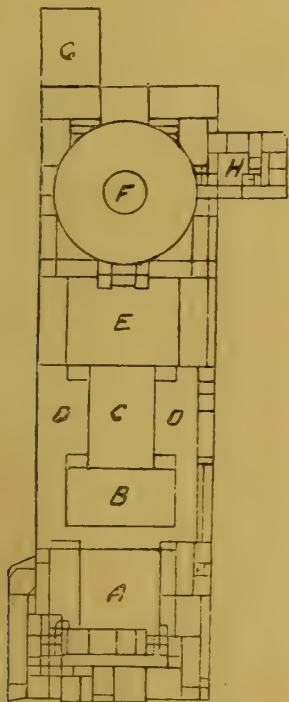


FIG. 8.—A, assembly-room block; B, winter garden; C, open garden; D, colonnade; E, foyer; F, circus; G, stables; H, offices.

behind the building, with stables, offices, all necessary adjuncts, and a diorama above. In 1891-'92 a large winter garden was erected in the space between the assembly rooms and the circus; different architects were employed for the various additions to the building.

On the ground floor of the front block is a large public restaurant with treasury on the right and offices on the left. This restaurant is about 80ft. square.

The first floor is occupied (Fig. 7) by an assembly-hall reached by two broad staircases from the entrance passages below. In connection with this hall is a suite of rooms with an inner or smaller hall. Elaborate precautions have been made as to exits, and the staircases are 12ft. wide.

The large hall, which is called the Theatre Room, is 100ft. by 75ft., and has a stage 50ft. wide by 30ft. deep. The smaller hall is 90ft. by 50ft., and on account of the colour of its decoration is known as the Blue Room. There is a foyer 80ft. in length and 20ft. broad between these two halls. With regard to the garden and winter-garden, which occupy the space between the assembly-rooms and the circus, there is nothing of especial interest to mention. There is a glass and iron colonnade between the winter-gardens and the assembly-room block of ordinary construction; but as to the circus, it is noteworthy that this is also used as a concert-hall when not occupied as a circus, the "ring" being boarded over and seated as the "area" floor. Between the garden and the circus is a large

promenade foyer. I shall not enter into a detailed description of the arrangements of the circus building here, as I reserve to a future time all references to buildings of this particular class.

#### THE SOCIETY OF ARCHITECTS.

A PLEASANT innovation was made by the Council of the Society of Architects, in their arrangements for the monthly meeting held on Tuesday. The new departure took the form of a "social smoker"; the meeting room of the society at St. James's Hall, Piccadilly, was sprinkled over with small tables and chairs, dividing the members up into little groups, and while two topics were set down for discussion, and were strictly adhered to, the proceedings assumed an informal and conversational tone. The experiment proved a success; the interest in the subjects under consideration never flagged, and the plan will doubtless be repeated once or twice a session in the future.

In the unavoidable absence of the President, Mr. WALTER L. EMDEN, J.P., vice-president, occupied the chair. Two new members were elected by ballot: George Hipwell Green, 13, High-road, Willesden-green, N.W.; and Rhys Samuel Griffiths, of Tonypany, Rhondda Valley. On the motion of Mr. ELLIS MARSLAND, hon. secretary, seconded by Major Leslie, a vote of condolence was passed with the widow and family of the late Mr. James Hicks, of Redruth, an old member of the society, and formerly a member of Council, and vice-president. Mr. BALDWIN, acting secretary, mentioned that in intimating her husband's decease, Mrs. Hicks referred to the warm interest he always took in the doings of the Society.

The Chairman then introduced the first subject for discussion,

#### "THE ACTION OF FIRE ON FIRE-RESISTING MATERIALS,"

remarking that he might claim some intimate knowledge of the subject as the originator of the fireproof theatre. He designed the first theatre constructed from top to toe, from foundation to roof, of fire-resisting materials throughout. When he proposed to erect such a structure in London he was met with the objection that it would be impossible to hear in such a building; but repeated experiment proved that concrete and iron provided an even more resonant structure than one lined with wood, for whereas the woodwork was necessarily of separate pieces joined together, the concrete could be rendered continuous. Indeed, in a building fitted up in teak the acoustic properties were found to be less clear and distinct than in one built throughout of iron faced with concrete. An unexpected proof of the facility with which sound was conveyed was afforded him. He had his office in the front building of Terry's Theatre, separated by a long passage from the auditorium. When he first occupied it he was often annoyed by a loud knocking, which proved on inquiry to be caused by the carpenters at work at the further end of the stage and at the rear of the building. When he spoke of fireproof structures he referred, of course, to those that would resist fire for a considerable time, for no substance was, strictly speaking, "fireproof," and while it was practicable to render such a building as a theatre sufficiently impervious to fire to resist such fires as might arise within it, it was obvious that such a mode of construction would not insure the stability of a warehouse closely packed with inflammable goods. The general materials which he employed in theatre construction were an iron skeleton well incased with concrete, the latter substance being somewhat different in composition to that usually adopted. He used a framework of expanded metal, or similar class of material, putting into it sufficient strength to prevent its getting out of shape and level. He then incased the girders and their mesh-work in concrete made solely of coke breeze and cement, facing it with other concrete in which chipped granite and a certain amount of sand were used with the cement; this latter facing was spread over the whole surface of the wall, entirely covering it. On the underside, or ceiling, he put a plaster surface, carrying through a key of, at least, 1½ in. By these measures the girders and intervening network of iron were thoroughly incased at every point, and should a fire break out in the building the girders would be so well protected that twisting and the consequent collapse of the structure would be prevented. Stone was a poor fire-resisting material, as it shelled

off under heat, and became worthless. Some years ago he had his attention called to the properties of iron slag to resist fire. A foundry was burnt out in which, for economy, the tank in the middle of the room had been roughly constructed of iron slag and cement. During the fire the water was literally boiled out of the tank, which was also exposed to the hose, but proved watertight when the fire was extinguished. He tried experiments with fires on iron slag laid on the floors and stage of Terry's Theatre, and found the material resisted the test well. Where gravel was used in concrete, the small pebbles would fly during a fire; but in concrete made with iron slag, there was no ingredient having such a tendency. He tested this point many years ago in concrete containing gravel used in the construction of the East London Railway, and came to the conclusion that this liability to fly was a grave defect. There was necessarily a good deal of woodwork in theatres, in the form of doors, &c., and these should be coated with some fire-resisting solution; for although no preparation of the kind would render the woodwork unflammable, it would enable the material to resist ignition for a long time—probably until the audience had escaped. All scenery should likewise be treated with similar solutions; but the certainty that every preparation would soon scale off, leaving the material inflammable, should not be overlooked. The only way to deal with the danger was to recognise that an outbreak of fire would probably break out on or behind the stage, and that the great risk to an audience was from panic. There ought, therefore, to be a good-sized lantern over the stage to permit of the exit of smoke, and the curtain should be of a kind, cutting off the flames from the auditorium. The architect must choose between saving his building or the public. He did not believe in an iron or other rigid curtain, for the more substantial it was the more easily was it put out of gear by an outbreak of fire. He used an asbestos curtain, which was hoisted and lowered in the ordinary course every evening. Such a curtain would not isolate the auditorium should fire occur; but if a line of sprinklers were fixed above it, the flames and smoke could be kept back till the audience had left. He never used automatic sprinklers with fusible plugs, one objection being that the heat at the proscenium level was always very great, but adopted sprinklers actuated by a single valve. This should be under the control of the fireman, and should be placed near the exit door from the stage, so that the fireman, knowing he had a direct means of escape, would keep cool during any panic. Similar sprinklers, controlled from the same point, should be placed over each line of scenery. The real point to aim at was to insure that the audience were free from panic.

Mr. C. E. GRITTON feared that one of the disadvantages of iron and concrete theatre construction was that external sounds passed just as readily through the building as that produced within the edifice. The sound of the Strand traffic was perceptible in Terry's Theatre. The danger of iron construction was that it suddenly collapsed under fire, and even when padded with silicate of cotton, as Professor Charles Goodman had shown, the coating fabric separated from the iron directly it was heated. The best material for resisting both fire and water for a time was wood.

The CHAIRMAN remarked that in any theatre facing the Strand there was much noise from street traffic; it was not more apparent at Terry's than elsewhere. Concrete could be so made and keyed to iron as not to fly during a fire, and theatres were not like warehouses, buildings containing much inflammable material.

Mr. E. J. KIBBLEWHITE observed that iron imbedded in coke-breeze or blast-furnace-slag concrete was not a novel form of construction. It was largely used by the late Matthew Allen in the construction of staircases for the Waterlow artisans' dwellings, and similar buildings. Many years ago he witnessed a fire in Hill-street, Finsbury, which convinced him then of the relative merits of stone and concrete when exposed to fierce flames: the concrete was uninjured, but under the fire and hose the stone flew to pieces.

Mr. HENRY LOVEGROVE had had much experience of warehouse piers, and believed iron and concrete construction would stand flames if the metal were well incased in the concrete. The danger in theatres, as Mr. Emden had said, was was not so much from fire as from panic, and the new regulations of the L.C.C. were excellent in



providing plenty of exits. They were now enforced in places of entertainment, and should also be applied to churches, chapels, and schools. He believed that the Globe and Court Theatres, designed by Mr. Emden, were the earliest constructed of iron and concrete, and now the system was universal.

Mr. ELLIS MARSLAND agreed that the aim should be to provide time to get the audience out of a theatre in a case of alarm, and the chairman had devised an inexpensive way of making such buildings fire-resisting. He was a firm believer in coke-breeze concrete as a fire-resisting material. In some artisans' dwellings joists 11 in. by 3 in. were provided, fitted with a fillet 2 in. up. They were filled in with 4 in. of concrete, which, of course, projected 1 in. below the joist, and was held in position by the fillet. He had a small section built, and tested it by lighting a fierce fire below it for two hours. The joists were slightly charred; but as little air could get near it, the floor above was intact. Coke-breeze concrete only crumbled at the edges under long exposure to a fire, and was thus fire-resisting for a considerable time.

Mr. EDGAR FARMAN urged that the great risks in a theatre were—first, that the audience might be seized with panic, and, next to that, the volume of smoke and fire resulting from the burning of the properties. The asbestos curtain with sprinklers above was, therefore, a great protection.

The CHAIRMAN, in summing up the discussion, said it was impossible to render a stage fireproof; but they could dominate it by sprinklers actuated from a single point. The great aim should be to give theatre audiences confidence in their ability to escape should any unforeseen occurrence arise, and this was greatly increased by the recent L.C.C. regulations.

#### VARYING LOCAL REGULATIONS AS TO DRAINS, ETC.

Mr. EMDEN then vacated the chair in favour of Mr. ELLIS MARSLAND, who opened a discussion on the varying regulations of local authorities, and the modes in which they hampered and embarrassed architects. He said he should confine himself to the by-laws of Metropolitan authorities as to matters of drainage. The regulations as to this subject were left to the local vestries and district boards, of which there were no fewer than 40 in the county of London. Eleven of these minor authorities had no regulations on the subject; six others made very meagre rules; twenty gave very full directions; and the remaining three made most prolix and arbitrary requirements. Even as to the amount of fall to be given to the house-drain, the twenty authorities named in the third class were not agreed, some demanding a fall of 1 in 30, another 1 in 40, yet another 1 in 48, and a fourth one as slight as 1 in 80. The regulations in the west of the Metropolis were better than those in the east and south-east, those in Fulham being among the best. He felt that they would agree that uniformity was desirable.

A discussion followed, in which Messrs. GEORGE HASLAM, of Ilkeston, H. LOVEGROVE, WILLIAM COOPER, of St. Leonard's-on-Sea, H. G. QUARTERMAIN, Major SEYMOUR LESLIE, G. A. T. MIDDLETON, R. W. COVENTRY DICK, and others took part, the provincial members urging that the building and drainage regulations should, as far as practicable, be uniform throughout England, and eventually a resolution was passed, on the motion of Messrs. MARSLAND and LESLIE, referring the whole question to the council for consideration and report.

#### CITY OF COVENTRY PUBLIC BATHS.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

WE give the plans and view of public baths which have been built by the Corporation of Coventry. It will be seen that all the baths (both slipper and swimming) and the whole of the service laundry department are on one level. The simplicity of plan thus insured, in addition to securing the utmost possible convenience to the public making use of the establishment, facilitates an economical system of administration with efficiency of working, easy and effective supervision, and minimum cost of construction. The men's and women's baths have separate entrances; between these is placed the checktaker's office, so that one person can take the money from both sexes and classes. The full total of private baths is—i.e., ten men's first-class private baths, twenty men's second-class private baths, four women's

first-class private baths, and six women's second-class private baths; total number of private baths, forty. Each of these sets or groups (all amply lighted and ventilated) is complete in itself, with waiting-room, w.c., &c., and it is to be noted that each attendant in charge of a department can easily supervise the adjoining one by means of the direct communication that has been provided. The first-class swimming-bath for men is conveniently near the men's entrance, with direct access from it as well as from their private baths. Its size is 90 ft. by 35 ft. The men's second-class baths are also conveniently planned, and are directly approached by a corridor 6 ft. in width from the men's separate entrance. Sixty-two dressing-boxes are provided for the first-class swimming-bath, whilst for use in connection with the second-class swimming-bath, which is of similar size to the first-class bath—viz., 90 ft. by 35 ft.—there are 59 dressing-boxes. In the first-class swimming-bath, the deeper end is placed on the side furthest from the entrance, and in both baths the full depth of water—viz., 6 ft. 6 in.—is secured to a distance of some 9 ft. or 10 ft. from the retaining wall of the deep end, so as to afford the greatest possible depth at the point where divers would enter the water. The shallow end of each bath is provided with a cast-iron scum trough. Between the deep ends of the two swimming-baths is placed an inspection chamber for the efficient working of the various valves connected with the supply and waste pipes. In all cases the requirements of public baths have been carefully studied, whilst every precaution has been taken in so planning the buildings as to insure thorough lighting and proper sanitary arrangements and ventilation to all departments. In view of the utilisation of the first-class men's swimming-bath as a public hall, two doorways are provided leading into the 6 ft. corridor, one at each end of the bath for exits. This corridor leads directly into Priory-street, and thus affords good facilities for public egress. All or any of the waiting-rooms adjoining the entrances from Priory-street would be available for cloak-rooms. The service laundry department has been placed at the east end of the site, from which it is directly accessible. The boiler-house, coal-store, &c., with good external access from the rear of site, is placed next to the service laundry, and a corridor leads to this and the service laundry from the 6 ft. corridor. The front of the baths abutting on Priory-street has been faced with the best local red bricks with Portland stone dressings. The entrance steps and all staircases are of granolithic concrete, and all balusters, &c., are of iron. The internal walls throughout are faced with selected facing-bricks, and the insides of the swimming-baths are lined with white glazed bricks. All floors and passages are of fireproof construction, and the flooring round the swimming-baths is formed in granolithic, and a curbed and sunk channel is continued in order to prevent the surface water from passing into the baths. The first-class private baths are of porcelain, and the second-class of enamelled iron. The front roofs are tiled with Broseley tiles, and the roofs of the swimming-baths are covered with the best Bangor duchess slates. These baths have been built by Mr. C. Gray Hill, of Coventry, at a total cost of £17,965 16s. 10d. Mr. Harold Burgess and Messrs. Spalding and Cross, F.F.R.I.B.A., were joint architects in the carrying out of the works, and Mr. Alfred Davies acted as clerk of works.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Institute of Architects was held on Monday evening at 9, Conduit-street, W., when the medals and prizes annually awarded to the successful students were presented. The walls of the room were hung with the premiated and other works, which were reviewed in our columns last week, p. 83. Mr. Alexander Graham, F.S.A., who occupied the chair, gave an address to the students, in the course of which he said that, looking round the walls, it could not be said that inactivity had prevailed in their ranks during the past year, or that artistic power and manipulative skill showed any signs of departure from the high standard attained in recent years. He ventured to think that any impartial critic would find in many of these works in line and colour far truer representations of the art of the architect than in the pretty little pictures that were made for the annual display at Burlington House. A work of architectural

merit could only be rightly judged by the realised combination of all its factors, and none but a skilled architect could form an approximate forecast of their realised expression. He made bold to say, with all respect to the august body that ruled at Burlington House, that the ordering of the architectural portion of the exhibition admitted of much improvement, and that more encouragement should be given to architectural drawings that were understood only by architects, and less to feats of pictorial draughtsmanship for the purpose of playing to the gallery. With regard to the designs submitted for the prizes, he observed that simplicity without poverty was more apparent in them than in similar competitions of recent years. Short critical remarks on the prize designs, written by Mr. William Young, Mr. Frank T. Baggallay, and Mr. A. Beresford Pite, were afterwards read, and Mr. Graham then distributed the prizes in accordance with the list published by us last week, p. 91.

#### SHOREDITCH FREE LIBRARY AND BATHS COMPETITION.

THE Shoreditch Vestry at their last meeting carried, by a majority of 40 to 21, the following amendment, which was thereupon adopted as a substantive motion:—"That so much of the report as refers to the library be referred back to the library commissioners, as the vestry have no power to enforce any instructions to them; but that so much of the report as refers to the baths and washhouses be referred back to the baths and washhouses commissioners, with instructions to call upon Mr. Rowland Plumbé to submit a report giving his reasons for placing plans No. 13 first, 22 second, and 30 third; also to report as fully as possible, in addition to the prize designs, on the plans numbered 2, 15, and 31; and that the commissioners be instructed to select the plan conforming nearest to the conditions laid down by them."

Previous to the passing of this resolution, the following letter from the professional assessor was read:—

13, Fitzroy-square, London, W.,  
13th January, 1896.

To H. Mansfield Robinson, Esq., LL.D.,

DEAR SIR,—In the *Hackney Express* notice of the proceedings of the Shoreditch Vestry of Tuesday last, Mr. Wakeling is reported to have said that "the information given by the assessor in making his report was of a most meagre and paltry character."

In reply to this statement, I feel it my duty to inform the vestry that I gave the commissioners most ample and detailed information on all the six designs to which he refers—viz., 13, 22, 30, 2, 15, 31.

Referring more particularly to No. 31, published as being by Messrs. Spalding and Cross, I pointed out that as an architectural design it was the least satisfactory of the six, being much broken up, and the idea of a general façade being thereby missed. Moreover, the projection of the bath-front beyond the library was also pointed out as being most unsatisfactory. As regards its planning, I pointed out the awkward way in which the main library stairs protruded into the lending library, thereby darkening the counter. As regards the baths, as used for their legitimate and ordinary purposes, I pointed out that the idea of a general ticket hall was not followed out, and that there was only one long corridor for both first and second class bathers, so that they would get mixed up in the inner hall, leading directly to the first-class swimming and slipper-baths, and I pointed out the confusion this would lead to, and that this arrangement applied to both sexes. I also pointed out the excellent arrangements for the use of the building for entertainment purposes, and showed the imperfect arrangement of the laundry. Not having disqualified the design, I did not think it necessary to point out many other ways in which the design did not technically comply with the London County Council By-Laws; for instance, the want of external ventilation and areas to many of the w.c.'s, and other matters, but I pointed out many other features, and gave similar detailed information on the other five designs. After doing this, I went through the drawings with the commissioners, pointing out and comparing the different features of the designs.

This being so, I beg to state that I have already given the commissioners the information required, and that my duties as assessor were completed and ended when an architect to the commissioners was appointed.

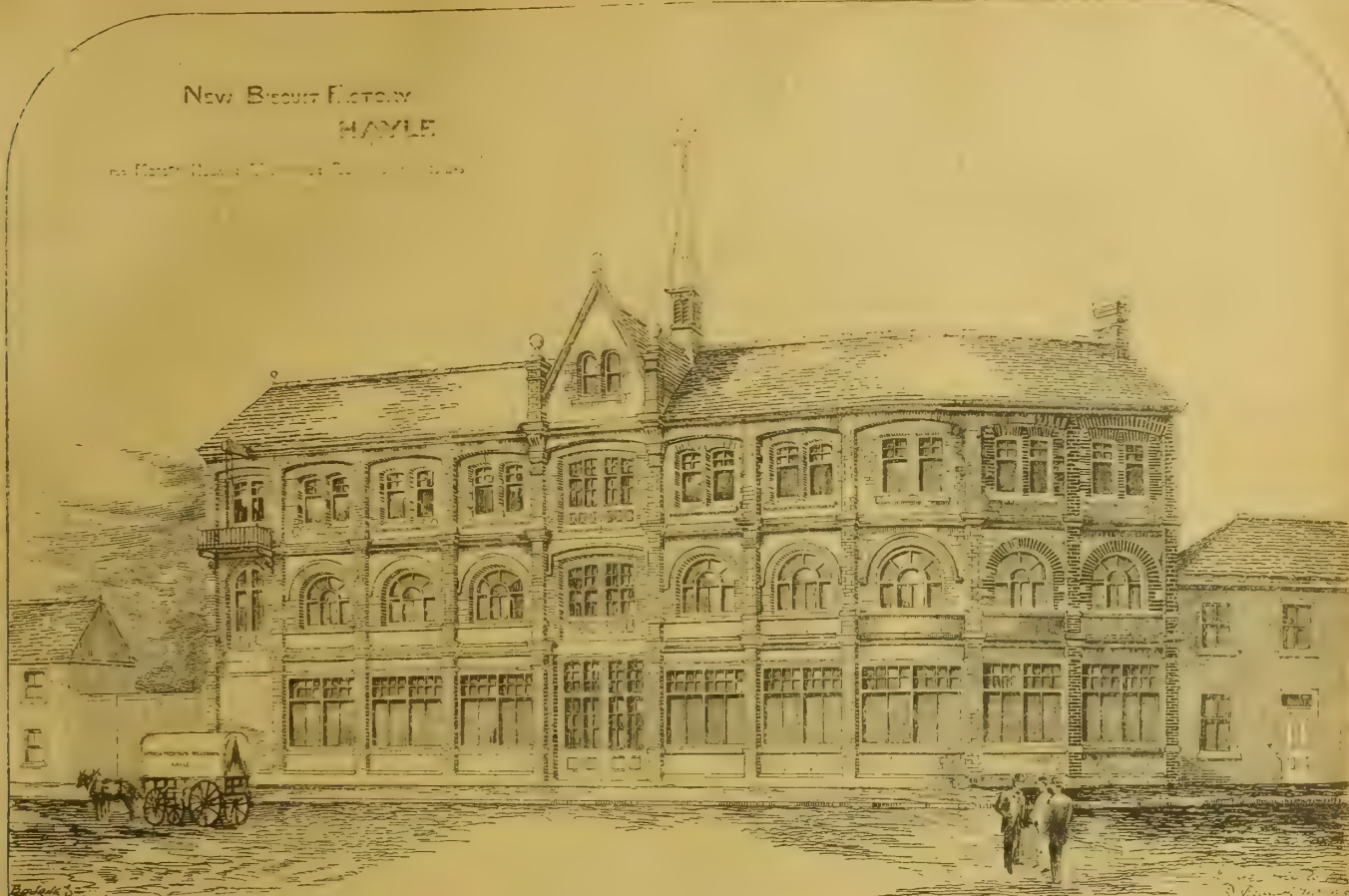
I trust this explanation will remind Mr. Wakeling that ample information has already been given to the commissioners, and that such information was not of "a meagre and paltry character."—I am, dear sir, yours very faithfully,

ROWLAND PLUMBÉ.

Mr. Wakeling said it was a most unfair proceeding to send this letter to the vestry. The proper course would have been to send to the commissioners. He challenged every remark in the letter, and he declared that he knew as much about the inside conveniences of a bath as the assessor.

The vestry voted a cheque for £500, sufficient to pay the remaining expenses of the competition, and including the vestry's share of Mr. Plumbé's fees of three hundred guineas as assessor, it being stated on his behalf that he was willing to





NEW BISCUIT FACTORY  
HAYLE

act as consulting architect without further payment. We hear that Mr. Plumbe has, since the meeting, undertaken to meet the commissioners and give the information asked for. The premiums to the authors of the first three named plans were also paid. We have illustrated all three of the premiated designs,\* as well as the fourth and sixth.† The fifth in the above list of the six chosen as the best by Mr. Plumbe is, we understand, the work of Mr. E. B. P'Anson; but the drawings numbered "15" were, if we remember rightly, withdrawn from the hall when the plans were on public exhibition.

#### HEATING AND VENTILATION.

**MR. WILLIAM BRUCE** addressed the Yorkshire College Engineering Society on this subject on Monday evening. Referring to ancient buildings, he said that when large buildings were erected in Britain a few hundred years ago, with their wide and high fireplaces, the flues were made of corresponding size, and, with the open fire on the hearth, the extraction of air from the interior would be enormous, assisted by the fire. The construction of some old buildings plainly indicated a careful study of the principles of heating and ventilation. The old fireplaces were built to allow of the largest possible direct radiation of heat, and, owing to their height, the temperature would be more regular than could now be obtained with the modern fireplace. From a heating, ventilating, and health point of view, the small ornamental modern fireplace was no improvement on the old. Reference having been made to the irregularity of temperature in modern rooms, where no special ventilation was provided, Mr. Bruce stated that there often exists 5° between the floor and the breathing level of a man standing in the centre of a room, and of 4° when sitting on a chair. After two gas-burners have been in use, a difference of 6° is often found between the air at the floor level and 5ft. 6in. above, and at the height of 10ft. the atmosphere has been found 19° higher than at the floor level. Special provision should be made in every room for the extraction of air above breathing level, and for that purpose large back-flap ventilators, with sliding fronts, are perhaps the best and cheapest

that can be applied. A coal fire, or an open gas fire with a Bunsen burner and asbestos balls, placed in a fireplace connected with the ordinary smoke-flue are, he said, similar in efficiency, radiating about 25 per cent. of heat, the rest escaping up the flue. Gas, when used in this way, was about double the price of coal. The too common practice of stopping up the flue and fixing the gas fire in the hearth near the fender, or in front of the fender, he strongly condemned. Although the efficiency of heat was increased, the ventilation of the room was seriously injured, as the atmosphere circulating round the gas fire became dried and burnt, very oppressive, and dangerous to health. Mr. Bruce spoke highly of the Roman system of warming by hot air with a good apparatus and properly constructed flues. If buildings were constructed for a warm-air system of heating and ventilation, the temperature in the rooms would be more regular and the ventilation much improved. A cheaper system of heating, requiring practically no attendance, was the use of oil or gas in a heating apparatus, which cut off the products of combustion completely from the air supply. With a hot-air supply for business premises, on a given area, not only would the first cost be less, but the saving in floor and cubic space would amount to £60 of additional rental per annum in a building containing 100 rooms, because an average of 7sq.ft. of floor space was gained in every room, after providing ample space for ventilation flues. The total gain thus amounted to 700ft. of floor-space, being equal to four ordinary rooms at £15 each.

#### BISCUIT FACTORY, HAYLE.

**THIS** commercial building is in course of erection at Hayle, in Cornwall, from the design of the late Mr. James Hicks, of Redruth. Local stone and bricks are used for the walling, and slates for the roofs. Owing to the death of the architect, no further particulars have come to hand.

A new girls' school and addition to the infants' school connected with the Wednesbury Parish Church were dedicated last week by the Bishop of Lichfield. Accommodation for about 300 additional children is provided—viz., 200 by the girls' school and the remainder by new classrooms and additions to the older buildings. The total cost will be about £1,500.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—A meeting of this Association was held on Thursday night in last week, Mr. Thomas Ross, vice-president, in the chair. Mr. David MacGibbon, F.S.A. (Scot.), read a paper entitled "Notes of Architecture in Lower Normandy." He began by giving a short account of the early architecture of Normandy, pointing out its leading peculiarities, which consisted of (1) wooden roofs; (2) western towers, with walls brought up solid from the foundations; (3) central lantern towers; (4) other special towers and details; and (5) the development of spires. Influences which produced the change of style in the royal domain were then referred to, and the introduction of the new Pointed style into Normandy and the progress of the latter styles were afterwards traced. A description of a tour through Lower Normandy, with illustrations of the various places visited, was also given.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—A lecture was delivered in the rooms, on Tuesday, by Mr. Thomas Bonner, F.S.A. Scot., Edinburgh, on "Ancient Mural Decorative Art in Scotland," Mr. Wm. Tait Conner, A.R.I.B.A., vice-president, in the chair. Treating his subject under two heads—"Ecclesiastical" and "Secular"—he said there were two examples of the former in Scotland—the most important being Glasgow Cathedral, the other example being in Dryburgh Abbey. What remains of the art in Glasgow Cathedral is now, unhappily, so decayed as to be almost invisible. The lecturer computed that the peculiar atmospheric conditions of the city in the last 50 years was more destructive in obliteration than those of the preceding 500 years. Dryburgh Abbey might be considered a humble example compared with Glasgow decoration, still it serves to show that such treatment of the stonework with colour was considered requisite for the full effect of the Church ritual. By way of comparison, England might be looked at, where circumstances were much more favourable. A typical example is to be found in the arches of the famous Galilee gallery of Durham Cathedral. In this outstanding piece of English decoration we recognise a marked resemblance to similar work in Germany and France, and also in the Gothic church of St. Francis of Assisi in Italy. It is also exemplified in a striking manner

\* BUILDING NEWS, Dec. 13, 20, and 27, 1895.

† BUILDING NEWS, Dec. 27, 1895.



in Norwich Cathedral, and also in the venerable church of St. Alban's, which is a complete museum illustrating every phase of colour decoration. In regard to the secular part of the subject, he said, Borthwick Castle, date 1430, shows traces of both design and colour having been carried out on a most elaborate scale. Regarding the nationality of the artists who had produced these works, the lecturer believed they were the workmanship of his own countrymen. The lecturer sought, in concluding, to appeal to the Association to consider whether they should take any action that would tend to the preservation of the ancient decorated roofs that are still left to us. A large number of coloured sketches and lantern slides were shown, and on the motion of Mr. Campbell Douglas, seconded by Mr. McGibbon, a hearty vote of thanks was passed from a crowded audience.

The Municipal, Free Library, and Science and Art School buildings at Falmouth are now complete, and will be handed over in a few days to the authorities. A very pleasant afternoon was spent on Monday week in the town-hall, when Mr. Carkeek, the contractor, gathered together all his workmen to partake of a dinner provided by the authority. Mutual congratulation was the order of the day. The buildings have been erected from plans by Mr. W. H. Tressider, borough surveyor, in collaboration with Mr. F. J. Bellamy, and were illustrated in our issue of April 13, 1894.

The urban district council of Sheerness are on thorns respecting the anticipated expense being incurred by an arbitration case now proceeding between themselves and a Mr. Killpatrick. Mr. Killpatrick originally claimed £75 for damages to his house, caused by the council's workmen putting down a sewer. The council offered £50; but this was refused, and an arbitrator was called in. It is estimated that the dispute will cost nearly £1,000, whereas the house when new was only worth £280, including the land.

At a meeting of the Hoyle and West Kirby Urban District Council, held on Monday last, it was decided to proceed with the completion of the council offices and town-hall, from the design of Mr. Thomas W. Cubbon, architect, of Birkenhead. The total cost of the completed scheme, exclusive of land, will be about £5,500, and includes large assembly-hall, council-chamber, departments for town-clerk, surveyor, rate collector, medical officer, fire-station, technical class-rooms, caretaker's residence, lavatories, &c.

A storm did a great deal of damage to Carlisle Cathedral on Wednesday week. The gable of the north transept of the cathedral suffered. The apex, with its carved ornamental stone cross, similar to that on the east end of the cathedral, and a portion of the north coping of the gable were blown down, and were smashed to pieces. The triforium window, composed of clear glass, in the south transept, was blown in, and a finial was carried away from the top of one of the south-east pinnacles.

The half-yearly report of the City and South London Railway Company states that most satisfactory arrangements have now been entered into in respect to the more important properties required for the extension to Finsbury-pavement, and justify the belief that the proposed extension can be carried out within the estimate named on Jan. 22, 1895. Preparations are therefore being made for carrying out the extension without delay, and the proprietors will be asked to sanction the issue of 20,000 5 per cent. preference shares of £10 each, which, it is estimated, will be sufficient to provide the amount required. The alterations at King William-street Station are completed, and will be brought into use in the course of a few days. The additional sidings at Stockwell are also finished.

The Government have informed the authorities at Portland that they intend to proceed at once with the new breakwater, the preliminary works of which are completed. The breakwater will be constructed by Departmental labour, and the following have been appointed to superintend the works:—Mr. Macfarlane, superintending civil engineer, and Messrs. Taylor and Colson, assistant civil engineers.

Biddulph Grange, Stoke-on-Trent, the residence of Mr. Robert Heath, was almost destroyed by fire on Thursday in last week. Very extensive alterations, involving an expense of £20,000, were in progress, and the wing which was being added is now in ruins. Nothing but the east and west wings remain; but the valuable pictures and statuary, however, were saved. The damage is estimated at £30,000.

New lecture-hall and class-rooms for girls, boys, and infants, also church parlour, have just been completed in connection with the New Ferry Wesleyan church, Cheshire, by Messrs. McLachan and Batkin, from designs and under the superintendence of Mr. Thos. W. Cubbon, architect, of Birkenhead.

## COMPETITIONS.

**SNODLAND BRIDGE.**—The project for constructing a bridge over the Medway at Snodland has just been advanced a stage by means of a competition for a premium of £50, offered by the combined parish councils of Snodland, Burham, and Birling for the "most economical and suitable design and estimate." The proposal is to construct a high-level vehicular bridge, reached on either side by a viaduct. The length of the Snodland approach would be about 1,200ft., and of the Burham approach about 1,420ft., the actual width of the river to be crossed being 240ft. In the conditions it was stipulated that the bridge must carry a roadway 18ft. wide, with two footpaths each 6ft. wide, making the total width of the structure 30ft.; that the bridge over the river should be in one span, giving a clear headway of 75ft. above Trinity high-water mark; and that the gradient of the approaches should not be steeper than 1 in 20. It was further stipulated that the structure should be designed to carry traction-engine traffic, the maximum load to pass over the bridge being 15 tons. The number of designs sent in for the premium offered was thirteen. Mr. De Michele, of Hingham, who acted as assessor, has awarded the premium to Mr. Henry Woodhouse, of Liverpool, submitted under the motto "Spero Meliora." The selected design shows a bridge the feature of originality in which is the use of arched steel tubes. The central span is supported by four steel tubes 6ft. 6in. in diameter, while the side spans, each 120ft. wide, are carried by similar tubes 3ft. 6in. in diameter. The tubes, when placed in position, would be filled with concrete to the necessary height to afford a foundation. The side walls are to be of timber, carried by steel lattice-work, while the roadway is of cement concrete, with an asphalt covering. An alternative design for the central span shows a bow-string girder in the place of the arched tube. Mr. Woodhouse's estimate of the cost amounts to £33,000. Tenders have been received for the construction of the bridge designed by Mr. Woodhouse. The offers received in reply showed a wide difference, but in some cases are below the estimate. Other designs sent in were by Messrs. H. Rigby and G. E. Montagon, Napier-yard, Millwall, estimated cost £38,138; Mr. J. R. Robson, 3, Victoria-street, London, and Gravesend, £31,463; Mr. T. W. Barber, 165, Queen Victoria-street, London, (two designs), £48,000 and £14,000; Mr. H. N. Maynard, 13, Victoria-street, London, £34,805; Mr. J. J. Webster, 39, Victoria-street, London, £32,023; and Messrs. T. R. Bennett and W. W. Preece, of the Engineers' Department, Great Northern Railway, £67,787. In the following cases the assumed names or mottoes of the competitors only have transpired:—"Alpha," £30,523; "Nodlands," £93,717; "Jessamine" (two designs), £109,898 and £75,016; "Cantilever," £23,690; "Experience," £50,140; and "Strength and Economy," £36,953. In many cases the principle of the specimen design prepared by Mr. Lambert, engineer to Mr. H. Peters, of the Cement Works, Wouldham, has been followed. The exceptions include Messrs. Rigby and Montagon, whose design shows a bridge of the suspension type, supported by lattice or Double-Warren type girders. The design placed second in the competition was that sent under the motto "Experience," by Mr. J. R. Robson. It is of brickwork, with a central span of steel.

**STOCK PRIZE.**—The council of the Society of Arts are prepared to offer, under the terms of the Stock Trust, a Gold Medal, or a prize of £20, for competition amongst the students of the schools of art of the United Kingdom, at the annual competition to be held in 1897. The prize is offered for the best original designs for an architectural decoration, to be carried out in painting, stucco, carving, mosaic, or any other process. This architectural decoration is to be either for the side of a room, or a hall, a ceiling, or the apse or side of the chancel of a church, or any suitable part of the interior of a building. The designs must be on imperial sheets. Each set must consist at least of a coloured drawing to scale of the whole design of decoration, and two coloured drawings of details on separate imperial sheets. Mere patterns or sketches of details, without the mouldings or borders necessary to make up a complete decorative scheme, will not be taken into consideration. The designs must have been made during the previous school year. The recipient of a prize awarded under this trust in 1893 cannot compete again. The designs are to be submitted, with other school work, in the

usual manner, to the Department of Science and Art, in April, 1897. Each of the imperial sheets, forming a set of competing designs, must be marked, "In Competition for the Stock Prize," in addition to being labelled or staged according to the regulations of the Department of Science and Art.

## CHIPS.

New stores for the Cornwall County Lunatic Asylum are to be erected at Bodmin, from plans by Mr. W. J. P. Jenkins.

The ruins of Abbey Cwmhir have recently been explored; but no vestige of the tomb of Prince Llewelyn has been found. The present level of the earth is considerably lower than the former floor level of the interior of the abbey church. It was excavated in 1836 or 1837, and no trace of a tomb was perceptible.

The large offices erected at Derby for the Derbyshire County Council have been used for the first time by the members of that body. In addition to a council chamber, the building contains rooms in which the various departments are consolidated. The presidential chair has been specially made, and ornamented from designs by Dr. J. Charles Cox, F.S.A.

At a meeting of the council of the Geological Society of London, on Friday, Dr. Henry Hicks, F.R.S., was nominated as president in succession to Dr. Woodward, who retires next month. The medals to be given at the anniversary meeting were awarded—the Woolaston to Professor E. Suess, of the University of Vienna; the Murchison to Mr. T. Mellard Reade, C.E., of Liverpool; and the Lyell to Mr. A. Smith Woodward, of the British Museum.

Prof. Flinders Petrie commenced his season's excavations at Thebes in the middle of December, and has already discovered a temple of Thothmes the IV. a little to the south of the Ramesseum.

The Essex County Asylum at Brentwood is to be further enlarged at a cost of £13,000 for building and £1,450 for furniture. There are now 1,635 patients.

A public and assembly hall is being added to the Royal Oak Hotel at Ledbury. The hall is 80ft. long by 30ft. wide, and is fitted with a stage, scenery and dressing rooms. The architect is Mr. G. H. Godsall, of Hereford, and the contractor is Mr. Geo. Hill, of Ledbury.

The annual general meeting of the Royal Society of Antiquaries of Ireland has been held in the Library, Royal Dublin Society's House, Kildare-street, Dublin. It was reported that at the close of the year 1895 the total number of names upon the roll was 1,325—viz., 200 fellows and 1,125 members—being 60 more names than at the close of 1894.

Mr. R. D. Holt has presented to University College, Liverpool, a bronze replica of the marble bust of the late Earl of Darby, past president of the college, executed by Mr. Thomas Brock, R.A. It is to be placed in the entrance hall of Victoria-buildings. Dr. Ricketts, of Birkenhead, has presented to the college his valuable collection of mineral and geological specimens.

The sewage scheme of the Salford Corporation came before His Honour, Judge Parry, recently at the Manchester County Court, on an application of the Salford Corporation for a time extension of three months in which to obtain official sanction to the scheme. His Honour described the scheme as thoroughly business-like and granted the extension.

The South Wales Railway Bill has been withdrawn, the promoters of the scheme, the Barry Railway directors, having made satisfactory terms with the Great Western Railway Company.

At Broadclyst Church, Devon, a pulpit, octagonal on plan, has been erected as a memorial of the 50th year of the ministry of the Rev. Sub-Dean Acland as vicar of the parish. Mr. E. H. Harbottle, of Exeter, was the architect; the contract was placed in the hands of Messrs. Dart and Son, Crediton; and Messrs. Easton and Son, Exeter, supplied the granite.

Mr. Anthony Lyons, Norton, Malton, is the successful contractor for all the work in connection with extensive alterations and additions to Ravenswyke Hall, Kirbymoorside, Yorks, for Mr. Harrison Holt, J.P. Mr. Temple Moore, 46, Well-walk, Hampstead, London, is the architect, and Mr. Fred Cartwright, of Sheffield, supplied the quantities.

The Local Government Board inquiry into an application of the city council of Exeter for power to borrow £11,000 for the purchase of the undertaking of the Exeter Electric Light Company, Limited, and for the construction of works of electric lighting, was held on Thursday and Saturday in last week before Colonel J. O. Hasted, R.E., (the inspector). The city surveyor (Mr. D. Cameron) and others gave evidence.



## CONTENTS.

Trees in Towns .....	117
Civil and Municipal Architecture .....	117
Exempted Buildings .....	119
County Lunatic Asylums.—XXXVIII.....	119
Classic Details and their Application .....	121
The Reapportionment of Rates and Taxes .....	121
Cast Iron in Builder's and Contractor's Work.—XIV.	122
Concert Halls and Assembly Rooms.—X.....	123
The Society of Architects .....	125
City of Coventry Public Baths .....	126
The Royal Institute of British Architects .....	126
Shoreditch Free Library and Baths Competition .....	126
Heating and Ventilation .....	127
Biscuit Factory, Hayle.....	127
Architectural and Archaeological Societies .....	127
Competitions .....	123
The Building News Directory .....	IX.
Our Illustrations .....	129
Building Intelligence .....	148
Engineering Notes.....	148
Correspondence .....	149
Intercommunication .....	151
Legal .....	152
Legal Intelligence.....	152
Our Office Table .....	153
Meetings for the Ensuing Week .....	153
Water Supply and Sanitary Matters .....	153
Statues, Memorials, &c. ....	154
Tenders .....	155

## ILLUSTRATIONS.

COLOGNE CATHEDRAL.—THE STEPHENSON LIBRARY, NEWCASTLE-ON-TYNE.—"BURT" MEMORIAL HALL AND OFFICES, NEWCASTLE-ON-TYNE.—ROYAL ACADEMY GOLD MEDAL COMPETITION DESIGN FOR A TOWN CHURCH.—OWEN JONES TRAVELLING STUDENTSHIP DRAWING OF TOMBS OF THE HALES FAMILY, CANTERBURY.—COVENTRY PUBLIC BATHS.—CLIFF PROTECTION AT SHERINGHAM, NORFOLK.—ST. PHILIP'S SCHOOLS, SOUTHPORT.—NEW BISCUIT FACTORY, HAYLE.

## Our Illustrations.

COLOGNE CATHEDRAL: DETAIL OF SOUTH-WEST TRANSEPT.

THE Photographic Society of Great Britain awarded their medal to Herr Anselm Schmitz, of Cologne, for his photographs of this splendid cathedral, and the detail print accompanying these notes forms one of the prize series of pictures referred to. A general view of the building was given, with some descriptive notes, in the BUILDING NEWS for Nov. 29, 1889, and at the same time the crowning stage of one of the western spires was represented. A further detail of the open-traceried work of these highly ornate and elaborated examples of modern Gothic stonework was published by us on October 31st, 1890. Our present plate illustrates the great portals to the south transept replete with their figure statuary, which forms so conspicuous a feature in the design of this great national work.

STEPHENSON LIBRARY, NEWCASTLE-ON-TYNE.

THIS building, which was recently opened by the Home Secretary, the Right Hon. Sir M. W. Ridley, Bart., is a gift to the city by the ex-mayor, Alderman W. H. Stephenson, during his third mayoralty. It stands on one corner of the Elswick Park, and comprises refreshment, reading, smoking, ladies', and committee rooms, and on the upper floor, the large hall, 70ft. by 36ft., to serve as the library and for meetings. The walls are faced with red Leicestershire brick, with dressings of stone and pink terracotta, and the roof is covered with red Ruabon tiles. The internal wood is of stained canary wood, except the roof of the large hall, which is of hammer-beam construction in pitch-pine. The windows throughout have lead glazing in clear glass, except the staircase, which has a fine stained-glass window. The carving on the principal front is the arms and crest of donor and the city arms. A special system of ventilation has been carried out to the architect's arrangements, the vitiated air being carried off in flues all over the building and discharged through a turret at the south-west angle. The heating is by radiators on a low-pressure steam system, and electric light is installed throughout. The general contractor was Mr. Walter Scott, the roof tiling was by Messrs. Beck and Sons, the plumbing by Messrs. Bland Bros., the painting and staining by Mr. John Gibson, the heating by Messrs. Emley and Sons, Ltd., the iron casements by Messrs. Ashwell and Nesbit, the lead glazing by Mr. G. J. Baguley,

the door and other fittings by Mr. N. F. Ramsey, the carving by Mr. Howson, and the electric lighting by Messrs. R. J. Charleton and Co. The whole of the works have been carried out from the designs, and under the superintendence of, Mr. John W. Dyson, M.S.A., architect, of Newcastle-on-Tyne.

## THE "BURT" HALL, NEWCASTLE-ON-TYNE.

THIS building is the headquarters of the North-umbrian Miners' Association, and has been named the "Burt" Hall, in recognition of valuable services rendered by Thomas Burt, M.P., as their general secretary for 27 years, and to commemorate his appointment to the Secretaryship of the Board of Trade in 1892. It comprises offices, hall for the meeting of delegates, committee-room, library, residences for the secretary and treasurer, &c. The walls are faced with red Leicestershire bricks, stone and terracotta dressings. The principal staircase is of oak, and there is an oak screen across the staircase hall. The meeting-hall on the upper floor, 48ft. by 26ft. and 18ft. high, has an oak dado round, and above the walls are finished in plaster, with pilasters, rich cornice, &c., and the ceiling, which is coved, of Minnesota yellow pine. The seating in the hall, somewhat on the plan of the House of Commons, is fixed, and entirely of oak, the seats and backs covered with green morocco. There is a raised dais at one end for the president and officials. The glazing to the oriel window is leaded glass, and six panels have medallions by symbolic designs. The general heating is by low-pressure steam, but in addition there are fireplaces in all rooms except the hall. The mantels are of Doulton faience and tile-work. Electric light is installed throughout. The gable on the principal front is surmounted by a miner in stone, taken from Ralph Hedley's "Going Home." The general contractor was Mr. S. B. Burton, the plumbing was by Mr. Stephen Percy, the slating (Westmoreland) by Mr. J. Hewitson, the plastering throughout is adamant, the window casements and heating by Messrs. Ashwell and Nesbit, the painting by Mr. J. Gibson, the terracotta, faience, and sanitary fittings by Messrs. Doulton and Co., the electric lighting by Messrs. R. J. Charleton and Co., the figure carving by Mr. R. Beall, the furnishings and seating by Messrs. Robson and Sons, and the door and other fittings by Mr. N. F. Ramsey. The whole of the works have been erected from the designs, and under the superintendence of, Mr. John W. Dyson, M.S.A., architect, of Newcastle-on-Tyne, and Councillor W. Flynn, of Gateshead, acted as clerk of works.

## ROYAL ACADEMY GOLD MEDAL COMPETITION: DESIGN FOR A BIG TOWN CHURCH.

WE published the interior perspective view of this design in the BUILDING NEWS for Jan. 3rd last, and to-day we give the plan and west front. The problem placed before the competitors provided that the plan should take the form of a Greek Cross, each arm of the cross to be about 60ft. between the walls, and the centre of the crossing to be covered by a dome or vault. In this plan, by Mr. Thomas Geoffrey Lucas, the requirements of a church are not overlooked nor ignored, provision being made for a morning chapel as well as a guild chapel, besides which there is a mortuary chapel near the west door, the baptistery chapel being located on the other side of the nave in a corresponding position. The planning of the sanctuary is well worked out, and the choir is brought forward into the body of the church. The presbytery is placed behind the high altar. We shall give a longitudinal section of the building shortly.

## THE HALES TOMB, CANTERBURY CATHEDRAL.

THIS monument was built into the wall of a chapel adjoining the south transept, from which it has lately been removed to the nave. The kneeling figure of a lady in the centre of the composition represents a member of the Hales family, whose son, having died at sea, is being lowered from the ship's side, in his armour, by the sailors. Behind this figure is painted a landscape with a river and castle, and several small figures representing the scene of the death of the youth kneeling below, who was the lady's grandson. The monument is of alabaster, painted and gilt, and dates from about 1594 A.D. The drawing is by Mr. J. J. Joass, then the holder of the Pugin Travelling Studentship, and it forms one of the series for which he was awarded the prize. His sketches made during his studentship are now on view at the R.I.B.A. in Conduit-street, W.

## CITY OF COVENTRY PUBLIC BATHS.

(See description on page 126.)

## CLIFF PROTECTION, SHERINGHAM.

THE cliff steps were erected in 1893, Messrs. North and Son, of Norwich, being the contractors. The timber groyne was built in 1894-5 without a contractor. The sea-wall now in course of construction is composed of Portland cement concrete, and the adjoining cliff is formed to an easier slope and flagged. These works have been carried out for the purpose of developing the Sheringham Building Estate—the property of Mr. H. M. Upcher, J.P., who is lord of the manor, and principal landowner—the work being carried out by Messrs. North and Son, of Norwich, from designs and under the superintendence of Messrs. Taylor and Grey, of the same city.

## ST. PHILIP'S SCHOOLS, SOUTHPORT.

THIS building is erected in Hampton-road, and comprises in the front portion of the building a central hall 61ft. 6in. by 24ft. 6in., with classrooms on either side. On the ground floor at the back portion of the building, cut off from the central hall by store-rooms and a passage, is the infants' room, 31ft. by 16ft. by 13ft. high. The remainder of this floor is occupied by two cloak-rooms and lavatories, one for girls and infants and one for boys. The basement is used for stores and chamber for heating apparatus, coal, &c. The first floor contains committee-room and lavatory and caretaker's house, which consists of kitchen and scullery, and in the attic are two bedrooms. The elevations are built in parpoints with Longridge stone dressings. The roofs are covered with Vellenheli slates 24in. by 12in., and the turrets with Edwards's red tiles. The total accommodation for children is 316. The cost of the entire building was £3,500. Mr. Goodwin S. Packer, Shaftesbury Buildings, Southport, was the architect.

## CHIPS.

The eleventh anniversary dinner of the Institution of Junior Engineers takes place to-morrow (Saturday), the president (Mr. Archibald Denny) in the chair.

The parish church of St. John the Baptist at Cirencester was on Sunday provided with a new organ, built at a cost of £1,615. The organ has been erected on the south side of the chancel, in the north-west angle of St. John's Chapel, instead of at the east end of the north aisle, as with the old instrument, and the choir has been removed inside instead of outside the chancel screen. The organ is a three-manual one.

Major-General H. Darley Crozier, R.E., Local Government Board inspector, held an inquiry at the district council offices, Radcliffe, Lancs, on the 16th inst., into the application of the district council to borrow £6,800 for the carrying out of works of sewerage, and £1,200 for the erection of stables, a mortuary, an ambulance-house, and storerooms. The surveyor, Mr. W. L. Rothwell, explained the plans.

Mr. Edw. W. Waite, C.E., the engineer to the Barry Urban District Council, has lodged his estimate that the cost of the additional waterworks proposed to be constructed under the powers contained in their deposited Bill will be £6,230, including the purchase of the necessary lands.

The Duke of Connaught will open the new wing of St. Thomas's Hospital on Feb. 11.

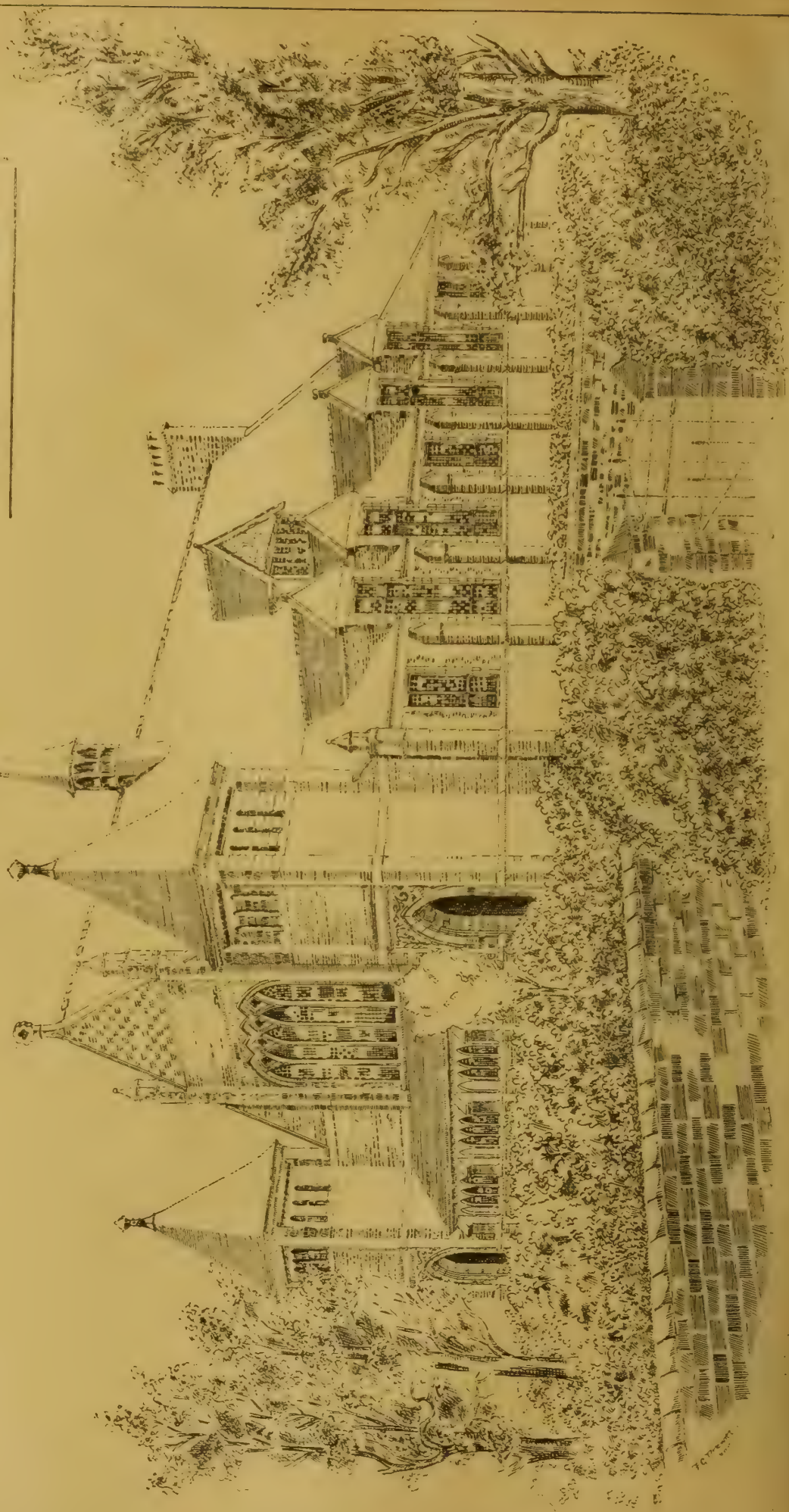
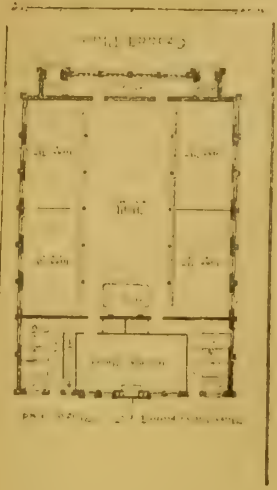
Mr. W. R. Light, the senior partner in a firm of builders and contractors at Portsmouth, died suddenly on Saturday morning. He was one of the magistrates of the borough, a member of some of the local boards, and a deacon at the largest Baptist church in the town.

The sixth annual social gathering and exhibition of the Northern Architectural Association Students' Sketching Club was held at the Grand Assembly Rooms, Barras Bridge, Newcastle, on Friday. Mr. Jos. Oswald, F.R.I.B.A., presided, and there was a large attendance of architects and students. Many sketches, the work of members of the club, were exhibited on the walls of the room, and music was provided by members and friends.

At the Kingston-on-Thames Brough Bench on Monday, Mr. Henry Clifford Holden, 44, a builder, was charged on a warrant with being concerned, with the two men Field and Clarke, now in custody, in obtaining by false pretences from George Willson £5 5s., with intent to defraud. The prisoner was alleged to have introduced Mr. Willson to the prisoners, who were prepared to advance £3,500 on a steamship. When arrested at Hampstead, prisoner said he had never heard of the man Willson. Prisoner was remanded in custody.



St Phillips School, Southampton.  
Goodwin & Pacher Architects

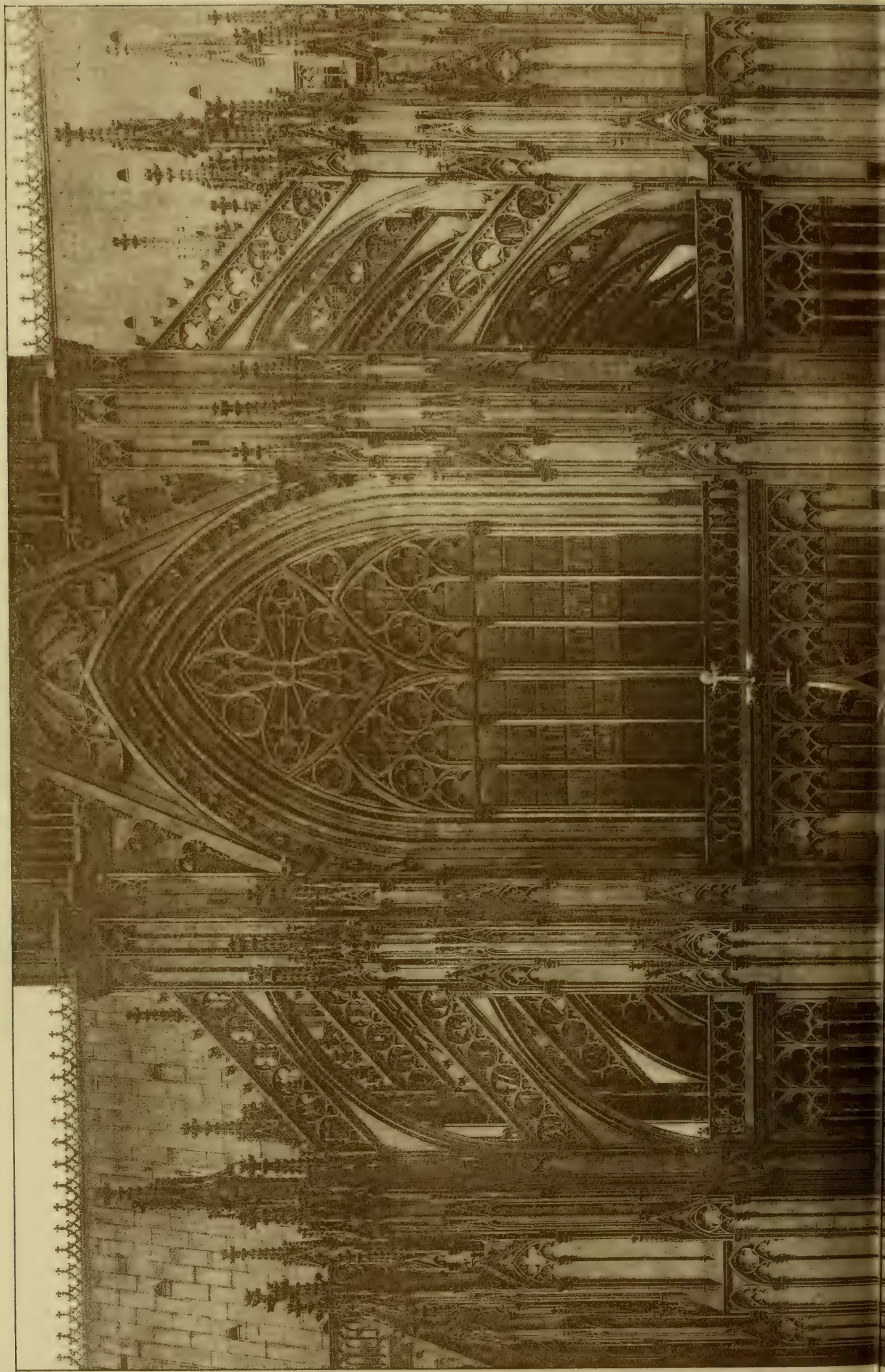




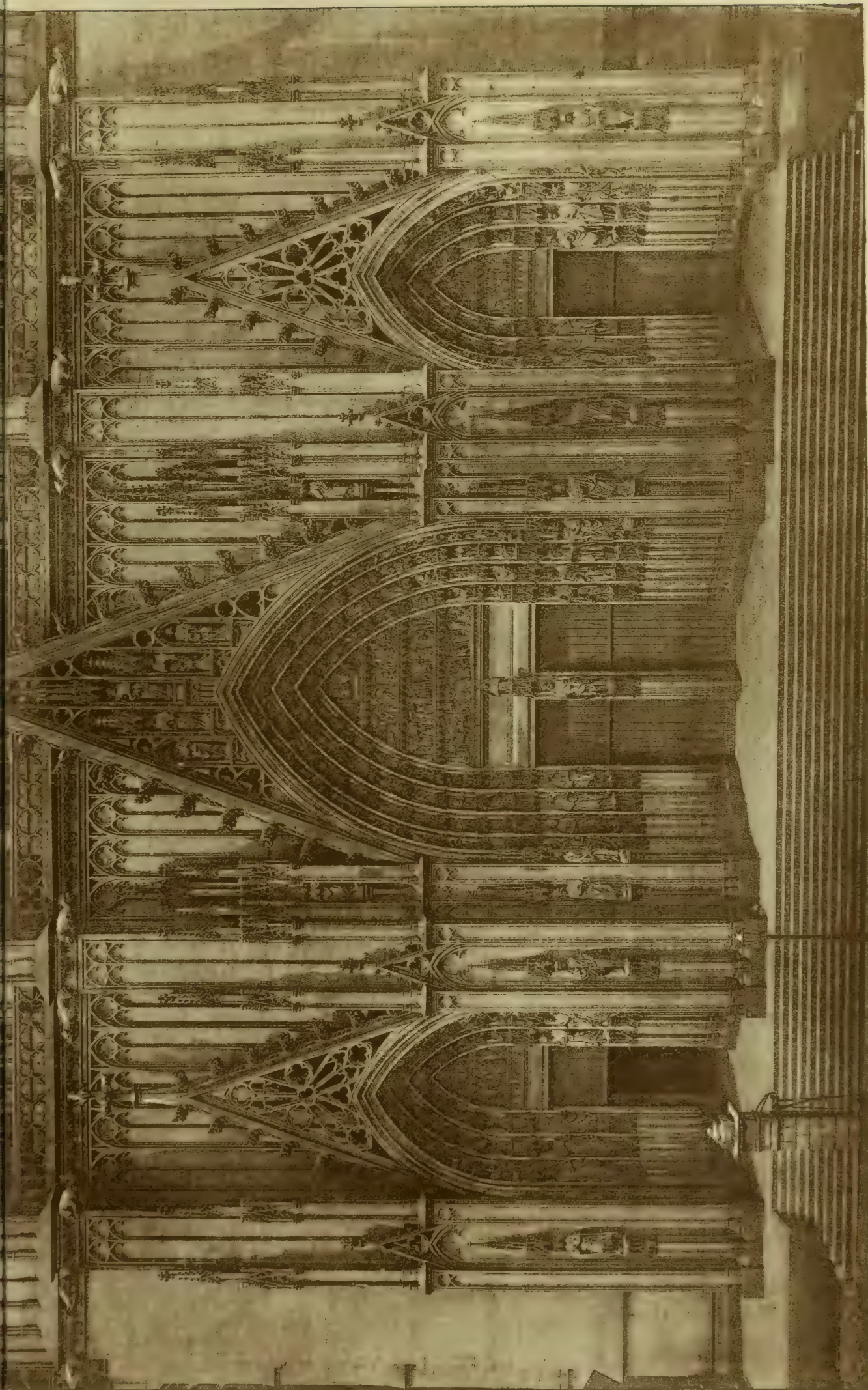




THE BUILDING DEWS, JAN. 24, 1896.







"PHOTO-TINT," by James Akerman & Queen, Square, London W.C.

COLOGNE - CATHEDRAL DETAIL OF SOUTH-TRANSEPT

FROM A PHOTO BY ANSELM SCIMITZ



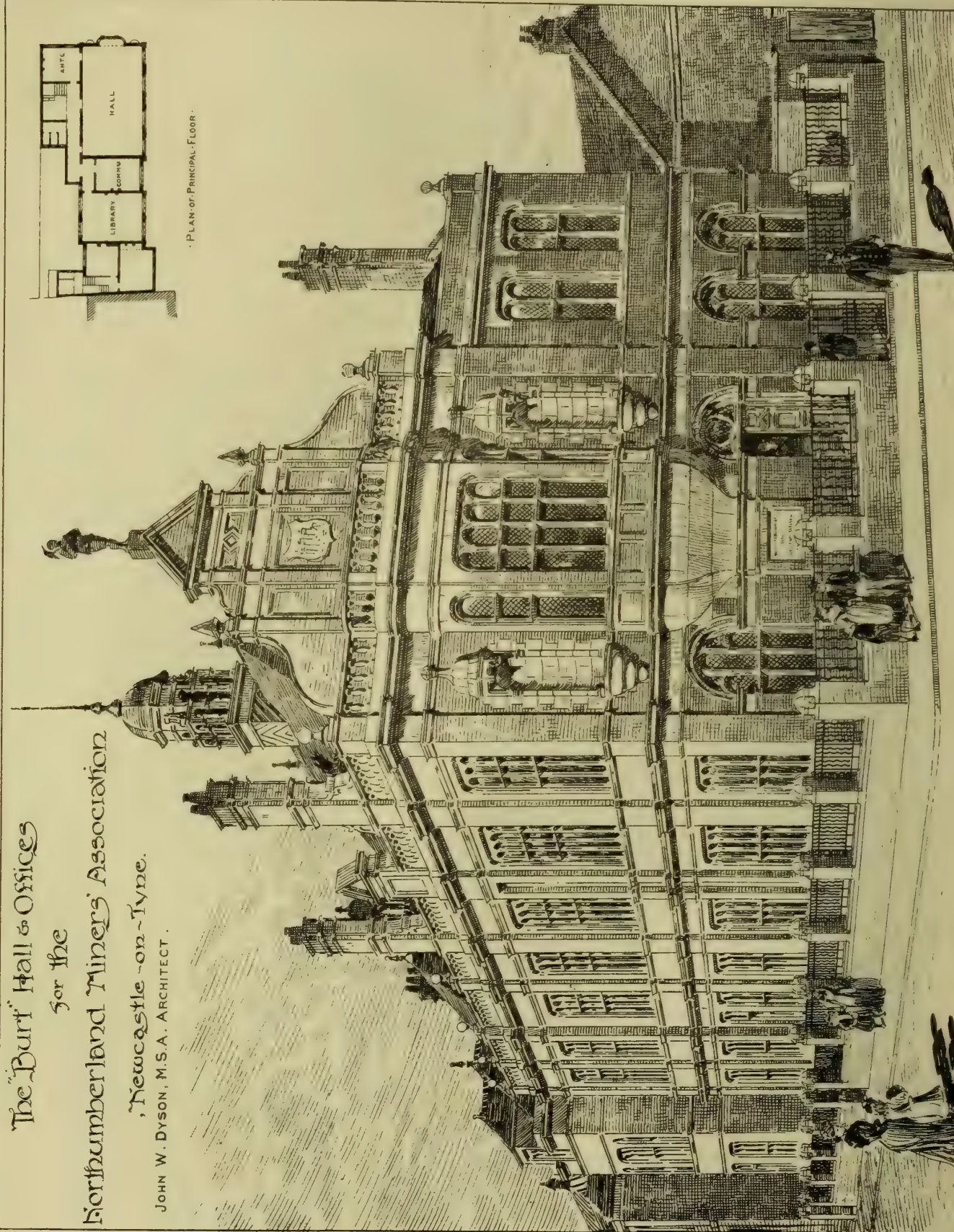








The "Burr" Hall & Offices  
for the  
Northumberland Miners' Association  
Newcastle-on-Tyne.  
JOHN W. DYSON, M.S.A. ARCHITECT.

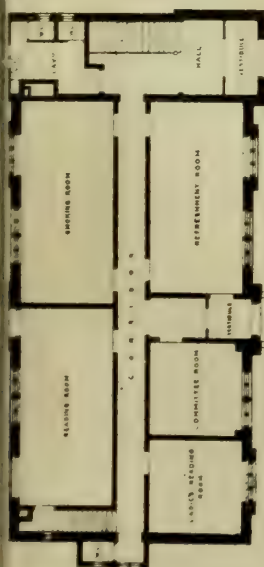


PLAN OF PRINCIPAL FLOOR.

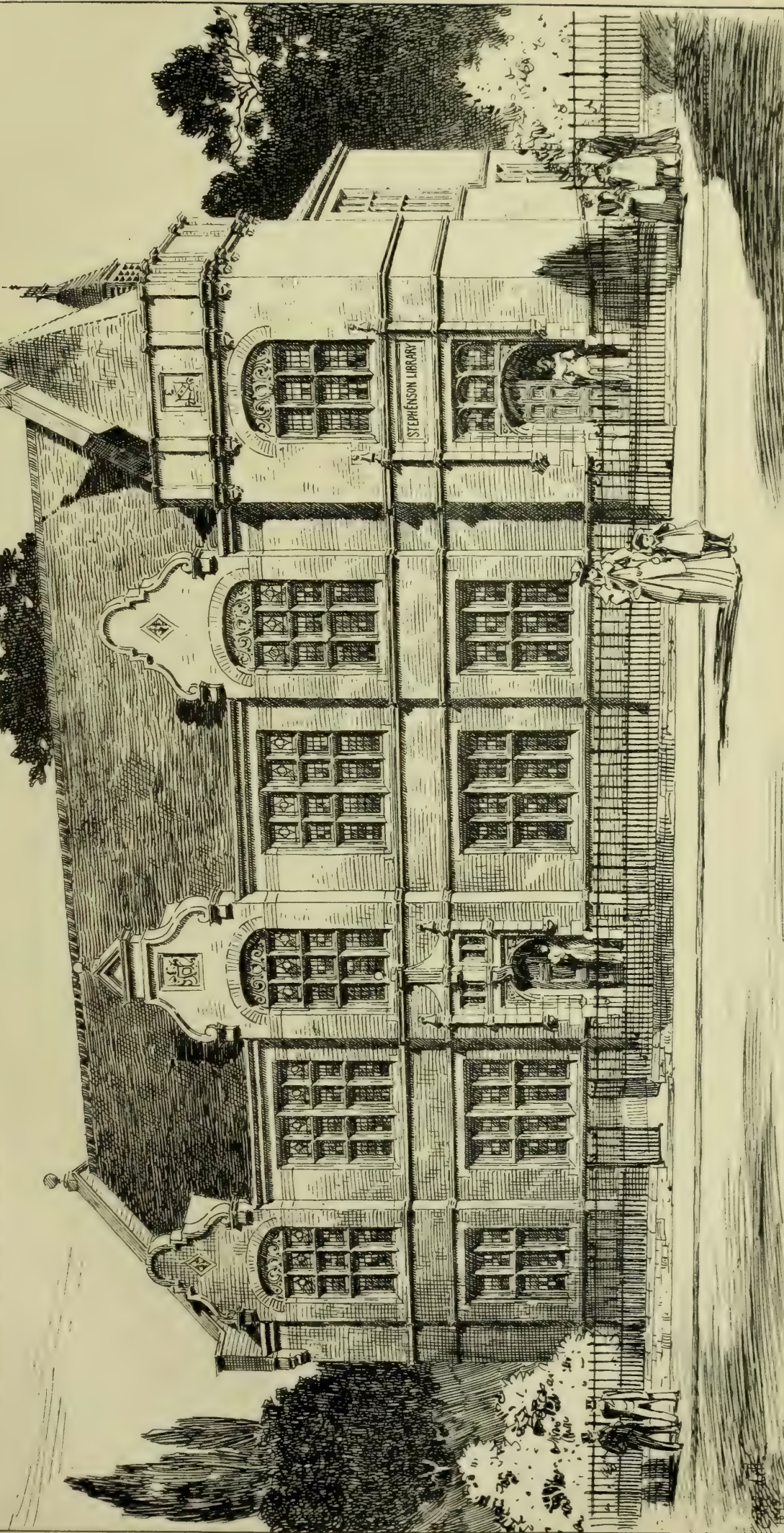




FIRST FLOOR PLAN



GROUND PLAN



—The "Stephenson" Library, Elswick Road, Newcastle on Tyne:—J.W. Dyson, M.S.A., Architect.



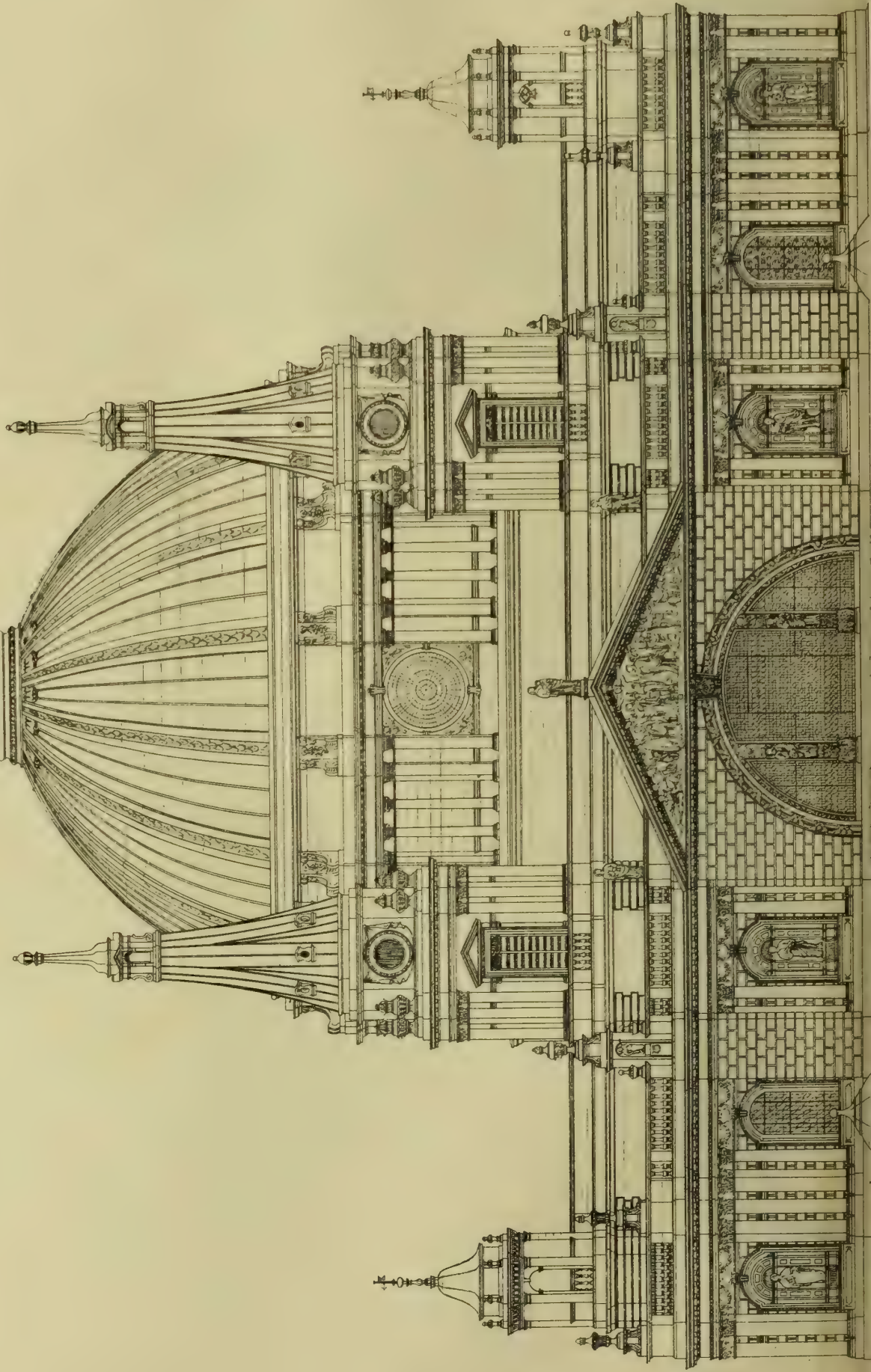








WEST FRONT.











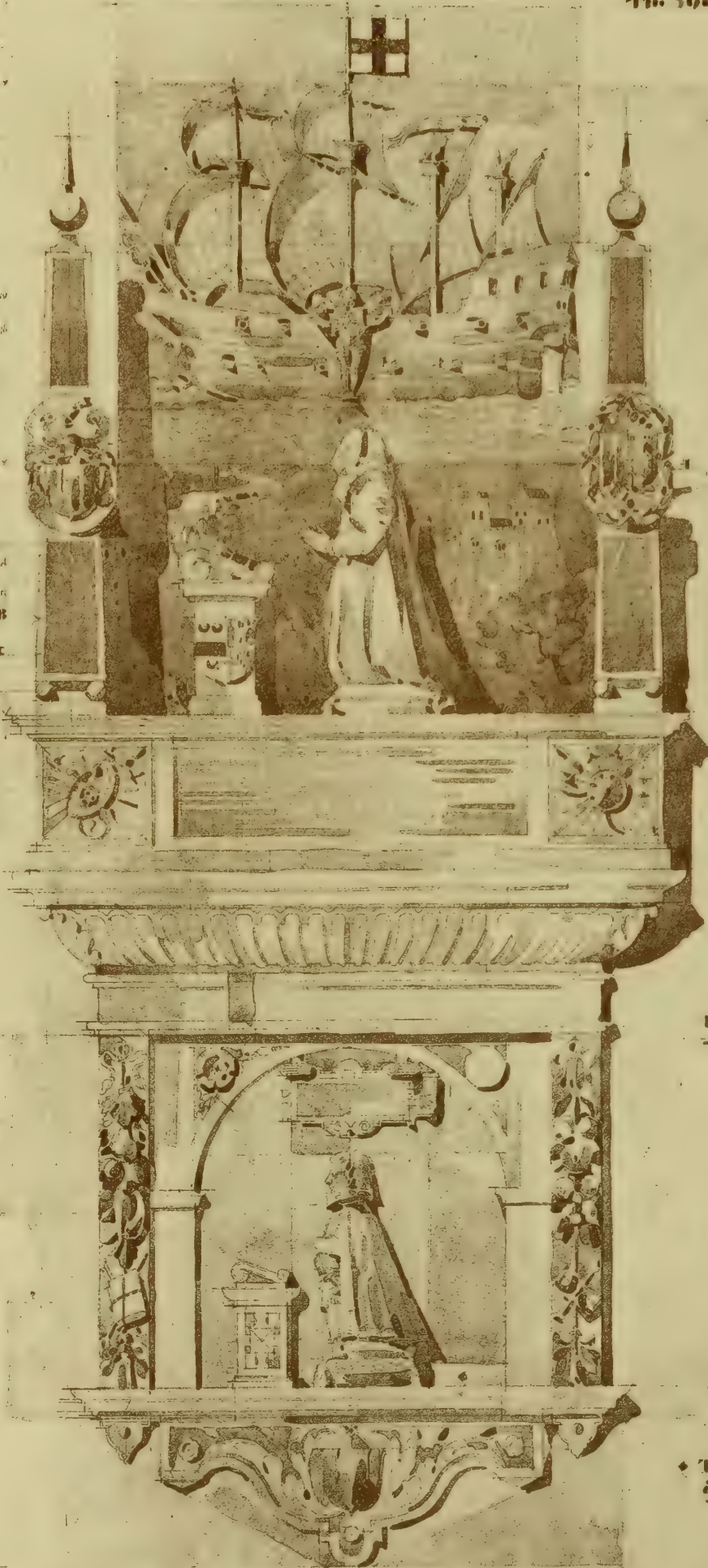






# CANTERBURY. TOMB OF THE TALEY FAMILY. 1591.

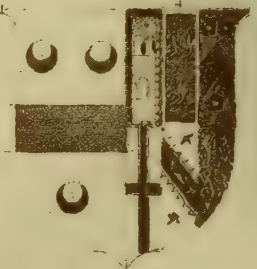
Note - The 'Tomb' is of  
alabaster painted red  
and the 'Landscape' under the ship painted  
'The Ship' which is



Shield of B. B. B. B. B.



Front of Crown B. B. B. B. B.



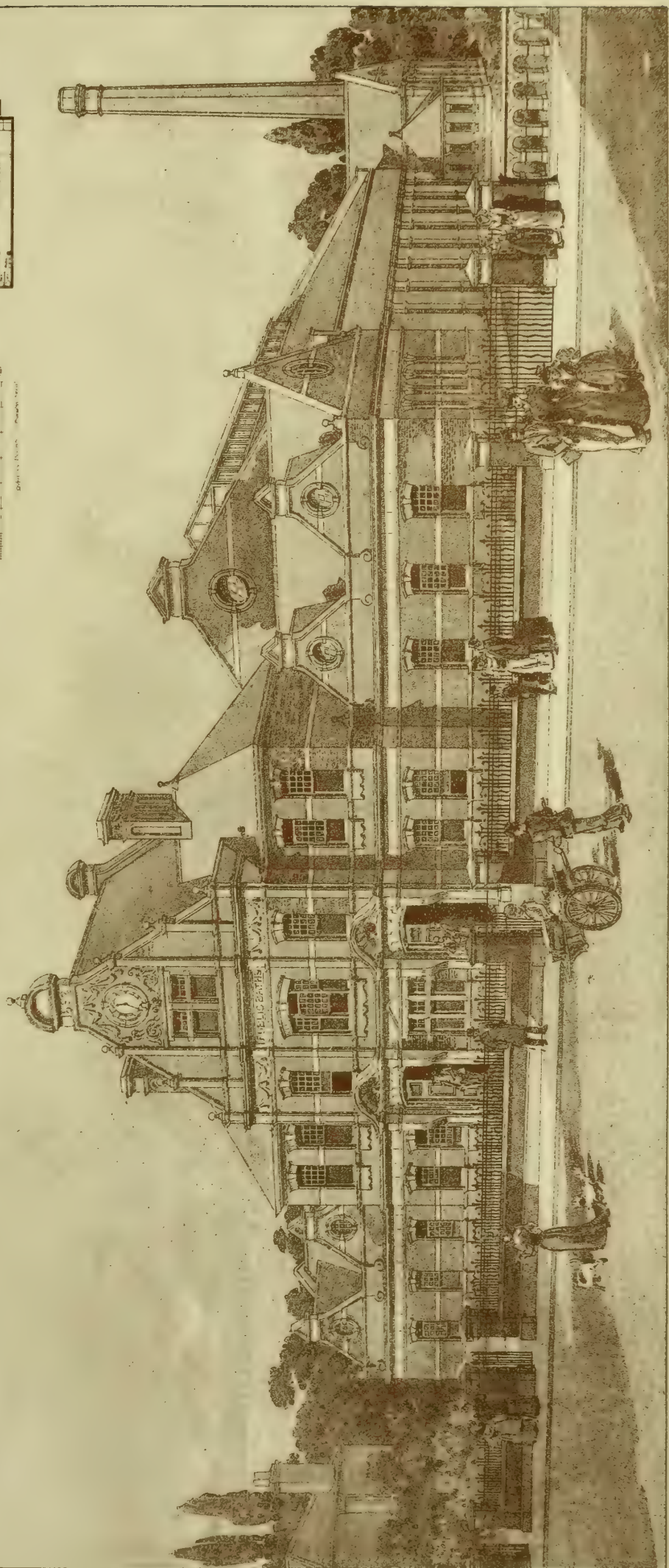
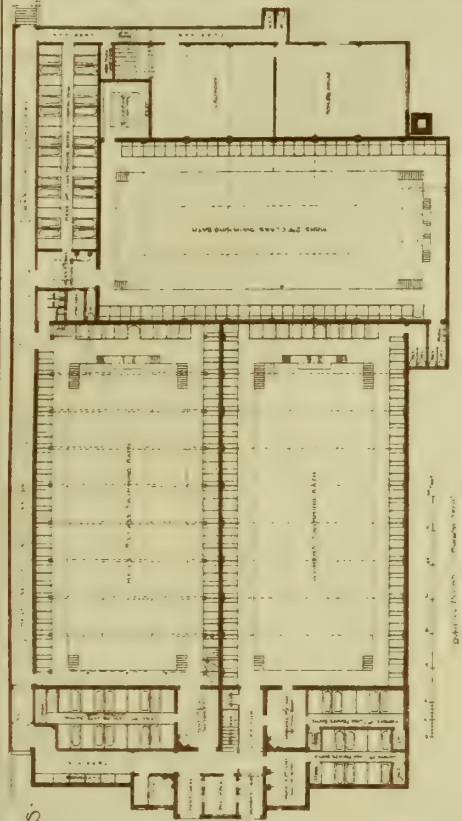
Shield of C. B. B. B. B.

The hands & feet are  
gone



THE BUILDING DEWS., JAN. 24, 1896.

COVENTRY PUBLIC BATHS HAROLD BURGESS & SPALDING & CROSS JOINT ARCHITECTS















CARPENTER

FROM THE WALL PAINTING IN

BY P. V. ...





E.V. GALLAND.  
1892

TRY.

THE HÔTEL DE VILLE, PARIS.

LAND.





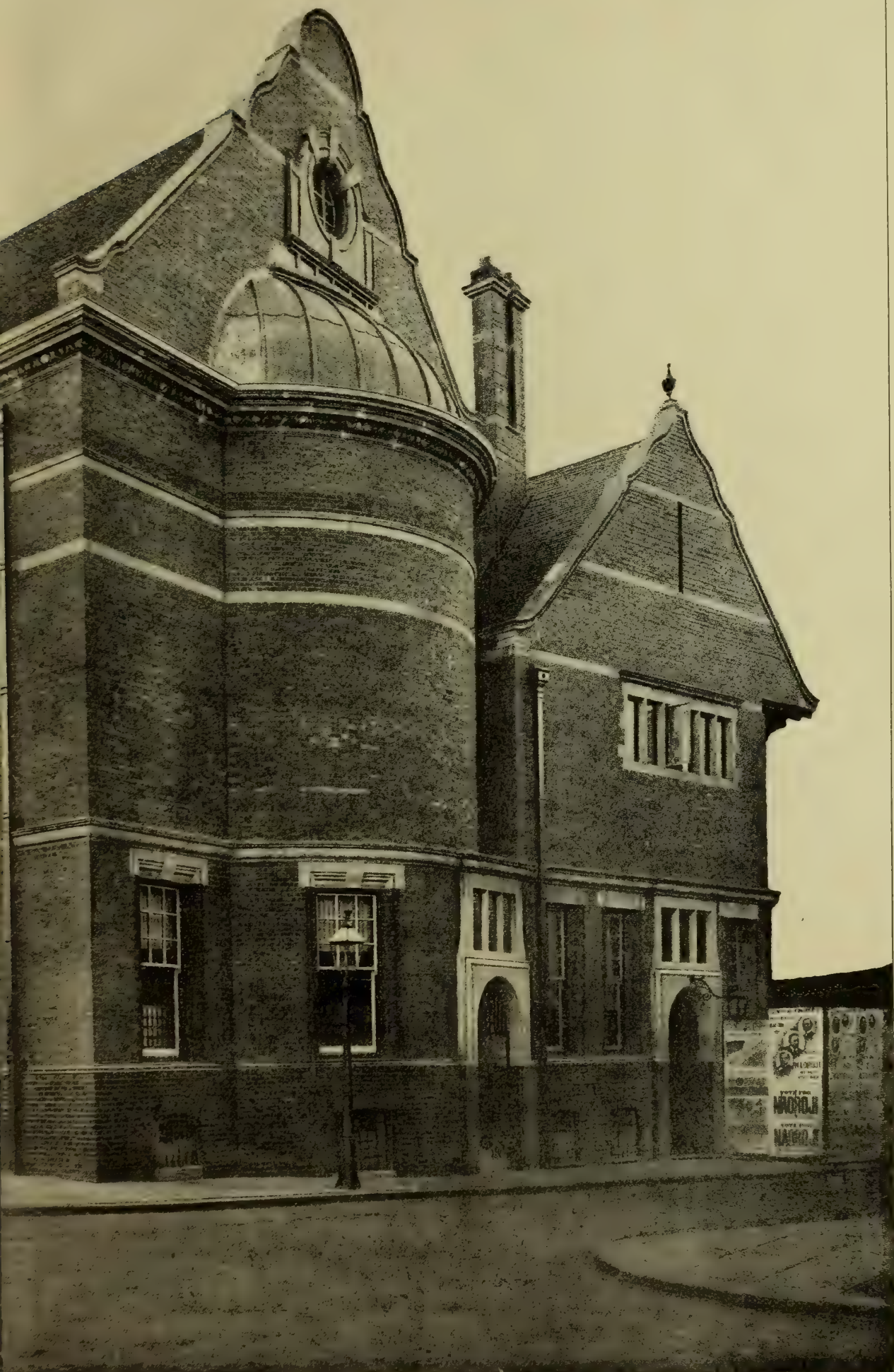














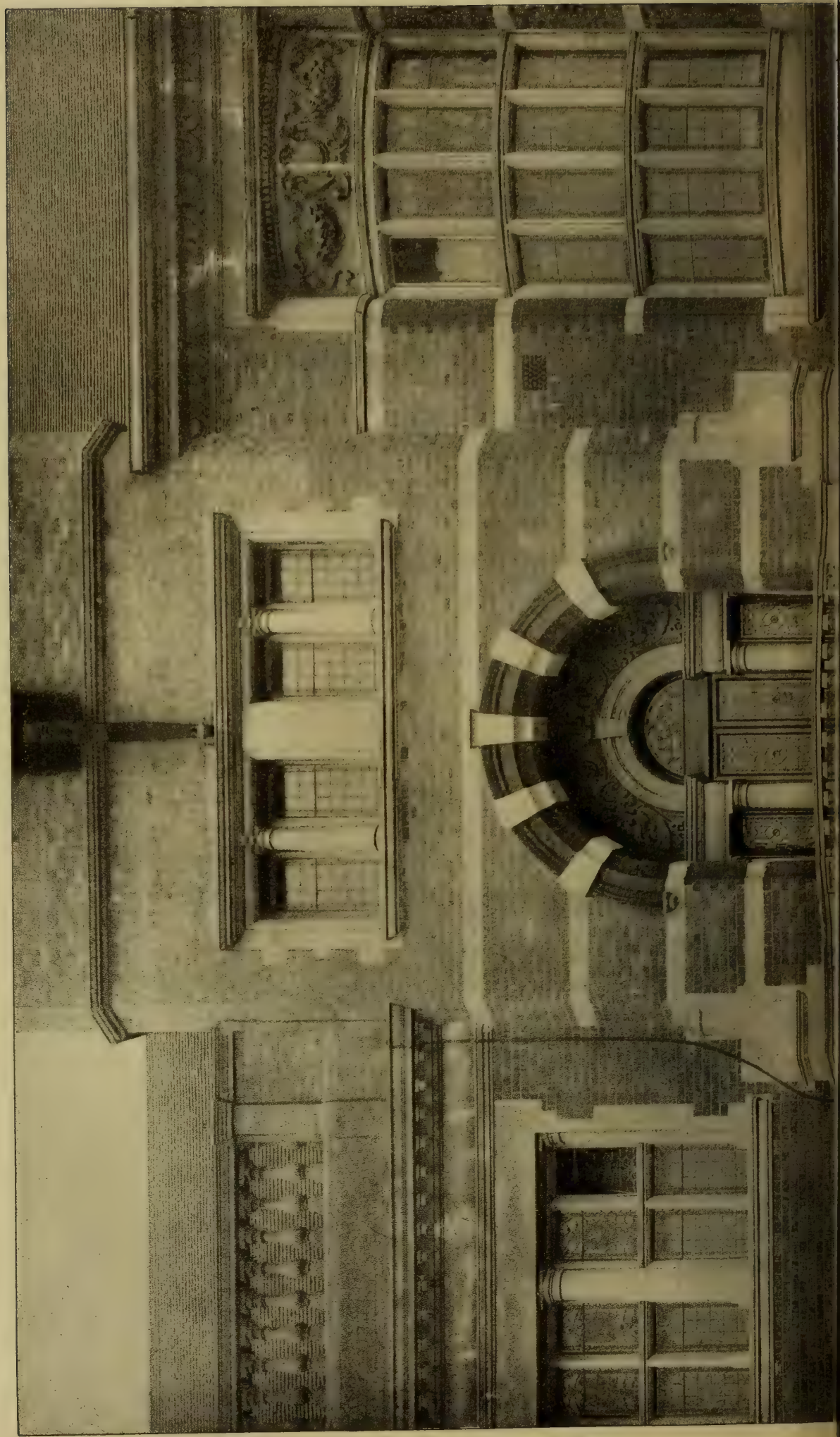




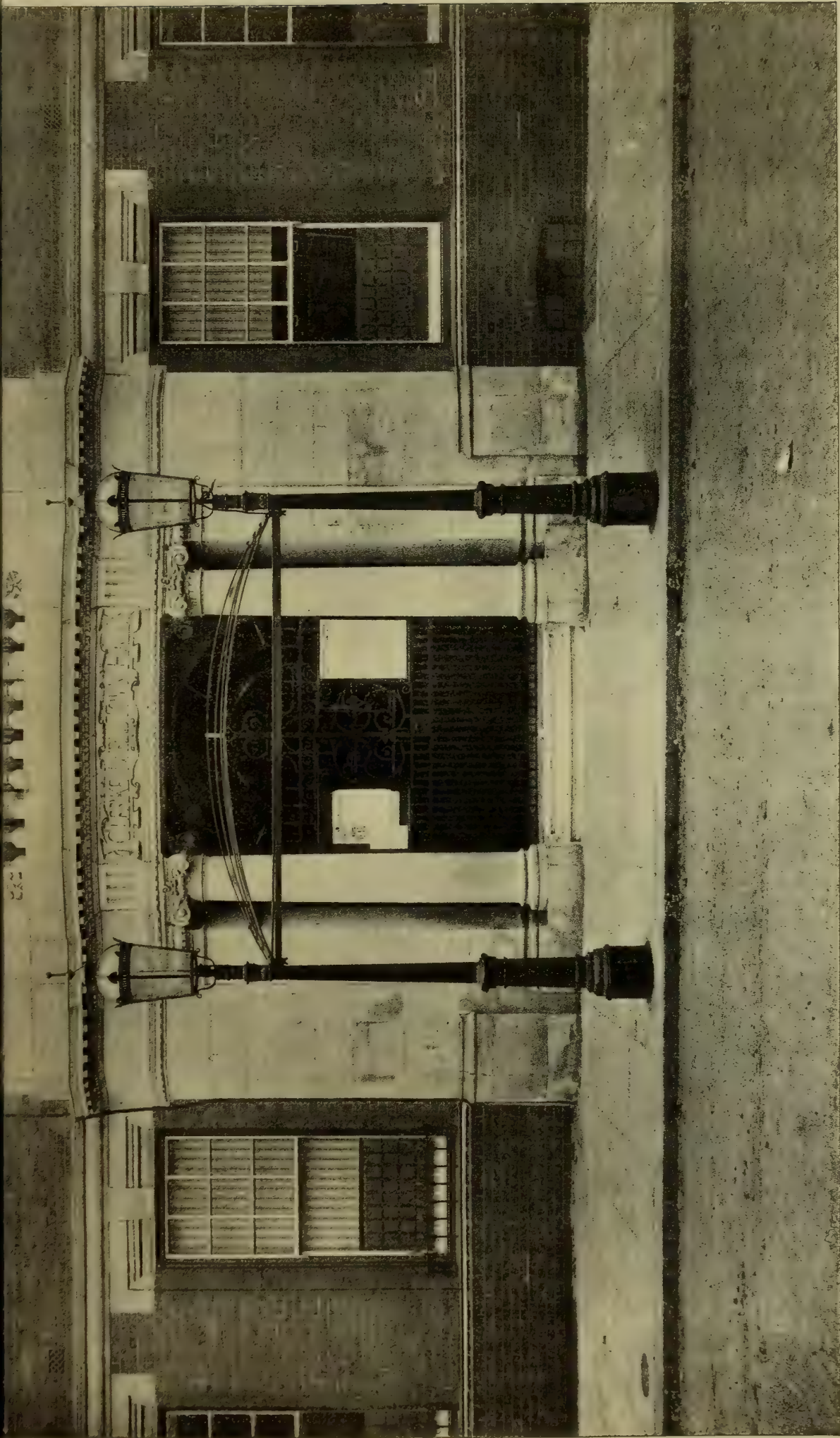




De Architect, Jan. 24<sup>th</sup> 1896.







PHOTOGRAPHED BY BEDFORD LEMERLE & CO.

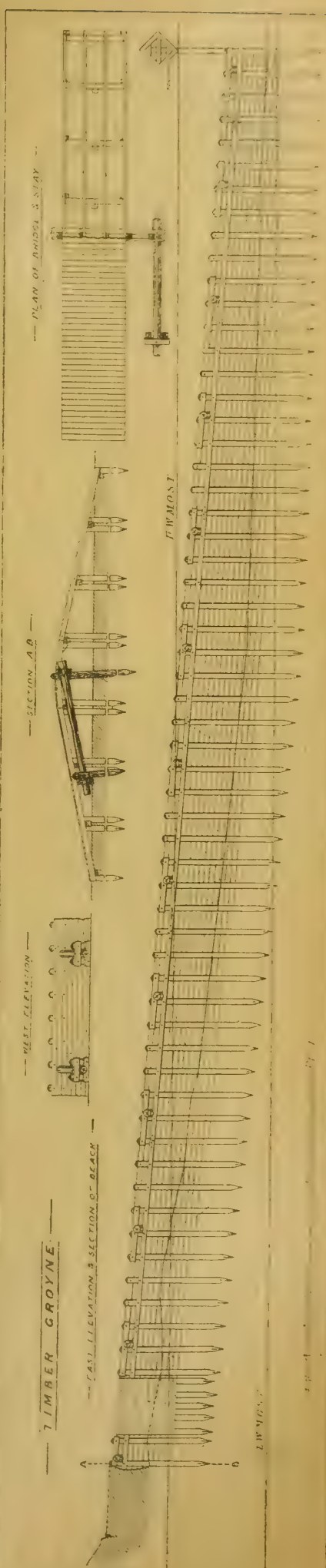
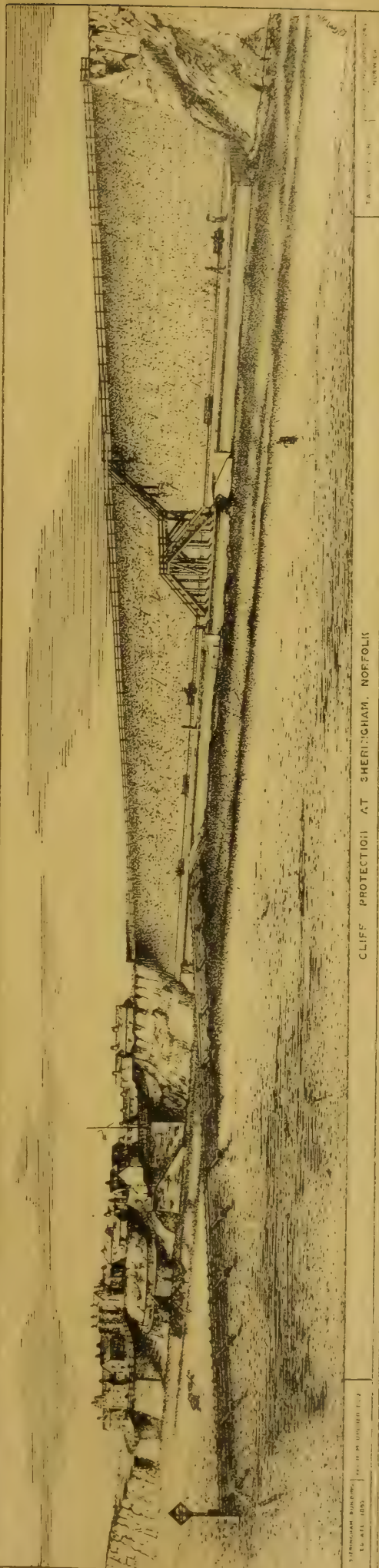
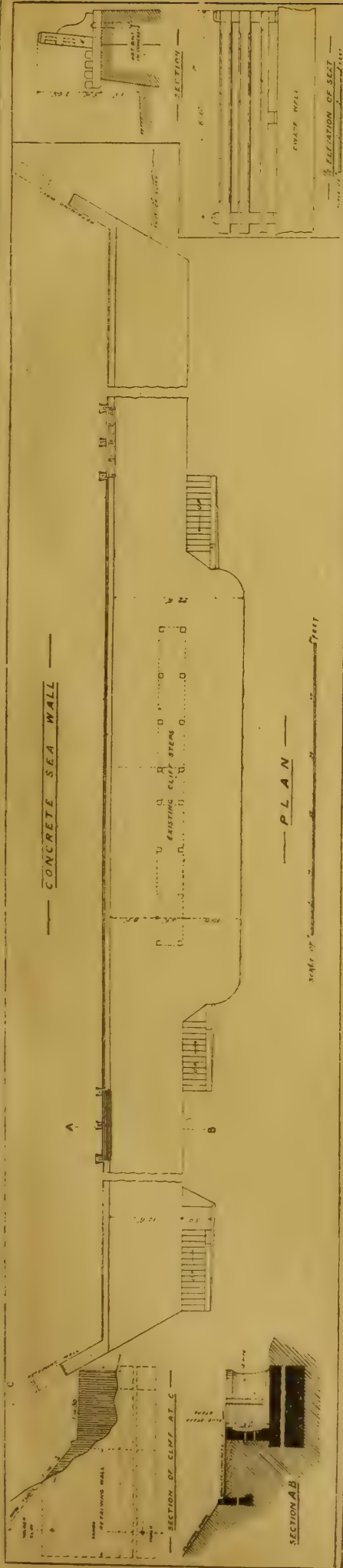
INK PHOTO SPRACUE & CO. 4 & 5 EAST HANOVER STREET LONDON E.C. 4

DETAIL OF DOOR: CLERKENWELL TOWN HALL.  
C. EVANS VAUGHAN, Architect.











## Building Intelligence.

**CAMBRIDGE.**—The new theatre, which has been constructed in the centre of the town, was opened on Monday night. There are nine exits, and there is seating capacity for 1,400 persons in orchestra and other stalls, pit, grand circle, gallery, and amphitheatre. There is considerable standing room in addition, without blocking the gangways. The proscenium opening is 27ft. 6in. wide, and 26ft. 9in. in height, and the full width of the stage is 56ft., and the depth 36ft. The height of the grid is 54ft. 3in. Ample space is, therefore, given for the manipulation of heavy sets. The flies are at a height of 22ft., with a spacious movable bridge, together with a painting frame for scenic work. The dressing-rooms form a separate block in the rear. The decoration of the theatre is in the character of the French Renaissance. The architect is Mr. Ernest Runtz, of Moorgate-street, E.C., and the contractors are Messrs. Colls and Sons, Coleman-street, E.C.

**COLCHESTER.**—The commencement of the restoration of the metropolitan parish church of St. Peter, Colchester, was begun on August 12, 1895, and the first portion taken in hand was the nave, by removing the old dilapidated roof with its plastered ceiling, and carrying up the north and south walls, increasing the height of the nave some 10ft. This has been executed in stone rubble, with septaria obtained from the coast of Brightlingsea. This has been carefully carried out, old Roman tiles being introduced so as to harmonise with the existing walls of the church, and has been approved on all hands, and pronounced to be a great success. The walls of clerestory are pierced with fourteen windows, of Perpendicular type, corresponding with the date of the church, executed in Bath stone, and glazed with tinted cathedral glass, each window having a hopper ventilator. A new open-timbered roof has been constructed of fir timber with moulded ribs supported on ornamental stone columns and corbels, covered with wrought V-jointed boarding and inodorous felt, and lead laid on rolls in narrow widths. The old chancel-arch, composed of wood, and of Tudor design, has been removed, and one executed in Bath stone, with label moulding and carved bosses. The gable over same is carried up in the same manner as the north and south walls, and surmounted by a stone-moulded coping. The whole of the plastering has been removed from the side walls of nave, and replastered to correspond with the new work, with moulded strings intersecting with the mouldings on the columns supporting the roof trusses. This adds another church to the thirty restored and rebuilt in this diocese by Mr. Joseph Grimes, contractor, of Colchester. The architects are Messrs. King and Lister, of Plymouth.

**LONDON COUNTY COUNCIL.**—At Tuesday's meeting of this body the following resolution was moved:—"That in any future scheme brought up by the Improvements Committee for improved street communication between Holborn and the Strand, it be an instruction to the Improvements Committee to consider and report fully as to the cost and convenience of a road through Great and Little Turnstiles to Lincoln's Inn-fields, and from Lincoln's Inn-fields to the Strand, either in a straight line or in a south-westerly direction." The motion was carried with an addition that the committee should consider an alternative scheme for a street across Clare-market, affecting Clare-street, White Hart-street, Stanhope-street, Blackmoor-street, and Catherine-street. It was referred to the Parliamentary and Highways Committees to consider and report without delay on the expediency of the Council applying to Parliament for power for the Council and the local authorities to construct subways under the streets of London, for the reception of the tubes and wires of the gas, water, electric, and other companies, and to charge rents for the same. The General Purposes Committee were asked to consider and report in the case of the contemplated destruction of any building of historic or architectural interest what course of action the Council should adopt.

**SHELTON, STAFFS.**—The parish church, which was built in 1834, has undergone extensive renovation, and was reopened by the Bishop of Lichfield yesterday (Thursday). In 1867 the old chancel was pulled down, and the present chancel erected at a cost of £1,558. At the

same time the nave was resetted throughout, the flooring rearranged, and the walls and ceilings redecorated, at a cost of £1,744. The church has now been restored in the interior, the present architects being Messrs. Scrivener and Sons, of Hanley. The electric light is being installed by Mr. Wm. Hodgkinson, of Hanley; and a high-pressure heating apparatus by Messrs. Bacon and Co., of London, is in working order. An oak reredos with terracotta panels is being provided. Mr. George Tinworth has designed the centre panel of the reredos; the panel will measure 10ft. in height by 5ft. in width, the central figure being about 4ft. in length. The subject is the Crucifixion. Mr. Tinworth is now at work upon the panel, and hopes to finish it in September. The six panels, with painted figure-subjects, which have been placed in the pulpit, are the work and gift of Mr. H. H. Hosband, of Shelton. The decorations have been designed in detail by Messrs. R. Scrivener and Sons, and have been executed by Mr. Thomas Bickley. The works have cost £1,100.

**ST. MARY WOOLNOTH.**—At the Mansion House on Wednesday, a public meeting was held to promote the objects of the City Church Preservation Society, "and specially to oppose the threatened destruction of St. Mary Woolnoth." Alderman Sir J. Savory, M.P., presided, and urged that it was both inexpedient and undesirable that the Church of St. Mary Woolnoth, which had been threatened to be removed first to give place to a post-office and now to a railway station, should be destroyed. The following resolution was carried: "That this meeting, while earnestly desirous of seeing further much-needed reforms carried out in the ecclesiastical arrangements of the City of London, is strongly opposed to the destruction of the City churches." Canon Newbolt proposed:—"That this meeting, while not opposed to the extension of the City and South London Railway, will resist by all means in its power the threatened destruction of the Church of St. Mary Woolnoth, for the purpose of making a railway station on the site; and that a copy of this resolution be forwarded to the promoters of the railway and their Parliamentary agents." This was seconded by Mr. F. C. Penrose, P.R.I.B.A., and carried.

The Local Government Board have sanctioned the amalgamation of the towns of Folkestone and Sandgate, which will now become one urban sanitary district under the Folkestone Town Council.

A new machine for street cleaning has been invented by Mr. Charles Jesson, of Hill-avenue, Victoria Park, Bristol. The machine is designed not only to sweep the streets, but at the same time to water and collect the refuse, and to deposit, by its own action, the refuse in ordinary collecting carts. The machine is designed so as to be easily attached to a low-built collecting cart, and when the cart is full it may be detached and placed at the back of another.

The will of Mr. Daniel Cubitt Nicholls, M.S.A., of the firm of D. Cubitt Nicholls and Sons, architects, 3, Howard-street, Strand, a member of the council of the Surveyors' Institution, and of the Tribunal of Appeal under the London Building Act, 1894, of 3, Upper Montagu-street, who died on October 17th, has been proved by Mr. Frank Cubitt Nicholls and Mr. Edward Cubitt Nicholls, the sons, and Mr. Alfred John Bingham, the executors, the value of the personal estate amounting to £10,257. The testator confirms the settlements made on, and subsequent to, his first and second marriages, and after a few bequests and legacies, the residue of his property is left upon trust for all his children. The deceased was for many years the adviser to the Home Office in relation to the Artisans' Dwellings Act.

The new Higher-Grade Schools for Stockton were formally opened on Saturday. The buildings are centrally situated in Nelson-terrace, and Mr. Bottomley, Middlesbrough and Leeds, has been the architect, and Mr. W. C. Atkinson, of Stockton, the builder. The structure is four stories high. The accommodation includes a gymnasium with balcony for spectators, a workshop, laundry and washhouse, and cookery-room with scullery. On the upper ground floor there is a central hall for the junior mixed classes and four classrooms, with a lecture-room for the senior classes. On the first floor is the senior mixed central hall, with five classrooms, a chemical laboratory, and preparation-rooms. The second floor contains two pupils' classrooms, a room for drawing-classes, and a room for modelling. The building is of red brick, and the style a free treatment of the Renaissance. Apart from the central halls, there is accommodation for 760 scholars, and for as many more in the technical department. The cost was £14,800, exclusive of land.

## Engineering Notes.

**CITY AND WATERLOO RAILWAY.**—The underground railway connecting Waterloo Station with the City is now complete, with the exception of a length between the terminal stations of 1,565 yards. As during the past six months a total length of 1,635 yards was driven, it is confidently estimated that the work of tunnelling will be finished before Midsummer Day. At present the tunnel City-wards has reached a point about midway between Benet's Hill and Lambeth Hill near the College of Arms. At the Waterloo end the tunnel has been driven about 150 yards eastward of the junction of the Waterloo Bridge-road with Stamford-street.

**THE BLACKWALL TUNNEL.**—The total approximate cost of the work executed in connection with the construction of the Blackwall Tunnel up to the end of December last is £573,560, of which £10,096 represents the value of the work done on the raised approach road. The cost of the operations during the past year was £106,703. On the south side of the river the cut and cover work was completed; and on the north side, out of a total length of 436ft., 398ft. had been executed. The caissons for all the shafts are now sunk to their final level. The work, as is now well known, has been carried out by Messrs. Pearson and Co., from plans by Mr. A. R. Binnie, prepared after consultation with Sir Benjamin Baker and Mr. Greathead. The resident superintending engineers are Mr. Hay and Mr. Fitzmaurice. The tunnel has an external diameter of 27ft., and will provide double lines of vehicular and pedestrian traffic.

### CHIPS.

The city council of Coventry (adopted, at their last meeting, plans by Messrs. G. and I. Steane, of that city, for additions to the fever hospital, including 32 additional beds for patients, and extra accommodation for the nursing staff. The estimated cost is £6,700.

On Thursday in last week, in the York Consistory Court, a faculty was decreed to take down the old church of Bessingby, near Bridlington, and to remove the font and the monumental stones, and refix and relay them in the newly-built church of St. Magnus, Bessingby.

Major-General H. D. Crozier, R.E., Local Government Board inspector, held an inquiry at the Town Hall, Ashbourn, on Tuesday week, respecting the application of the urban district council for sanction to borrow £10,000 for works of water supply.

The estate market sales at Tokenhouse-yard have been of an encouraging nature, the net total for the past week having been £31,315.

The annual general meeting of the Surrey Art Circle Society was held on Wednesday week, when it was announced that Mr. Alfred Gilbert, R.A., had accepted the position of President of the Society.

Some repairs are shortly to be undertaken in connection with the Monkwearmouth parish church, famed for its association with the Venerable Bede and its interesting history from antique times. To prevent destruction to the tower by vibration, the bells will not be rung in the future.

The Margate Town Council have decided that the market be pulled down and rebuilt, and nine stalls, facing outwards, together with offices for the borough officials, a retiring-room for the magistrates, and a public lavatory be provided, at a cost of £3,000.

The Greenock School Board have agreed to erect a new school at the corner of Nelson and Brisbane-streets, Greenock, at a cost of £10,000, and have instructed Mr. J. B. Stewart, architect, Greenock, to prepare schedules and carry out the work.

A stained-glass window has just been placed in the chancel of Garrans Church, Cornwall. The central light represents "The Good Shepherd," and in the lights on either side are demi-figures of St. John the Evangelist, St. John the Baptist, St. Peter, and St. Paul.

The Market Harborough Board of Guardians at their last meeting instructed Mr. Goodacre to prepare plans for a new board-room, to be built at the opposite end of the workhouse to the existing meeting-room.

The congregation of St. Mary's Established Church, Dunfriesshire, have resolved to spend £2,177 in the renovation and decoration of their place of worship. A memorial window is to be put in at the south end, in memory of the late Sir James Anderson.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

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## NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLI, XLVI, XLIX, LI, LIII, LIV, LVIII, LIX, LX, LXI, LXII, LXIII, LXIV, and LXV may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

W. C. W. (The Ashpitil Prize at the Institute was equally divided between Mr. G. J. T. Reavell and Mr. W. C. Waymouth, each competitor receiving £5 5s. The inconvenience of having to depend upon the not always articulate reading of the prize announcements at the Institute, for the names of the successful students is, of course, manifest; but facilities to the Press at Conduit-street are only partially afforded, and that in a way which is not conducive to the mutual advantage of all parties concerned. Information a week after date is of no use to us.)—A. G. BOND. (The word "opened" in the BUILDING NEWS Designing Club instructions respecting the secretaire is a misprint. It should have been "OPEN"—that is to say, the space below is to be left free for the knees of the person writing at the secretaire.)

RECEIVED.—Frederick M.—J. B.—W. W.—J. Bently.—A. Jones and Co.—Anxious.—R. N.

## Correspondence.

## SHOREDITCH BATHS COMPETITION.

To the Editor of the BUILDING NEWS

SIR,—Although I have probably lost and won as many competitions as any other architect, I have shown no disposition to air my private grievances in the public Press on the occasion of my failures. Mr. Rowland Plumble's letter to the Shoreditch Commissioners, replying to my letter of protest against his award of the first premium, is, however, so likely to lead to misapprehension in the minds of your readers, that I feel compelled to reply to it, and, with it, to some portions also of a second letter sent to the Commissioners by Mr. Plumble, and which I am greatly surprised was not published with the other, the subject-matter of both being almost entirely personal to myself.

To deal first with the letter you published in your last number, I do not think it quite fair for Mr. Plumble to express regret at the withdrawal of my plans, for on being asked by the Clerk if he should give up my drawings, he, in reply, said to Dr. Mansfield Robinson, in the presence of my routine clerk: "I do not blame Mr. Tiltman for taking his plans away before exhibition. I should do the same myself, were I in a similar position."

It is not true to say that I went to the public exhibition of the designs with the view of upsetting and casting a slur upon the award. My plans were withdrawn directly after the public announcement of the award had been made, and for the reason only that I could not afford to publish details of my practice in baths and washhouses; and this withdrawal was made before the exhibition of the drawings was opened, and after the drawings of another competitor—a well-known architect of high position—had also been withdrawn. As there appeared to me to be no impropriety in my going to see the plans, I did so, with the result that I at once entered my protest against the award of the arbitrator solely upon the one point of the failure of the accepted plans to meet the requirements of the London County Council as to their granting a license, and in no other way criticising the selected design. I, with the other competitors, had tacitly accepted Mr. Plumble as the assessor, and his choice of designs cannot now be very well discussed, in my opinion, by a competitor.

This license of the County Council is distinctly one of the primary conditions of the competition, and I repeat that I have observed it and every other practicable condition. The only point wherein my plans may need alteration was rendered necessary by Mr. Plumble's own conditions—i.e., that the gallery of the first-class bath should go round three sides only, whereas to give all the occupants of the gallery equal means of exit it should go round four sides. I prefer, however, in place of this counter-assertion, to suggest a reference to the superintending architect of the County Council for his opinion, and I am surprised that Mr. Plumble himself has not seen fit to carry his own condition on this point to its logical conclusion, by recommending that both Mr. Hare's plans and mine be submitted for the provisional sanction of the Council's architect. So far from my request to the commissioners upon this point having been acceded to, I am credibly informed that Mr. Hare has been asked to bring up a plan having its first-class swimming bath where his second-class bath now is, and overlooking Coronet-street. If it is true that this change is to be made, it will absolutely involve the replanning of the whole of the bath buildings, and would be most unfair to the other competitors as well as to myself. I still claim the reference practically promised by the terms of the conditions, and, if this is made and I fail to substantiate my contention on this point alone, I will undertake to pay to the Architects' Benevolent Society the sum of 25 guineas to prove my *bona fides*. Will Mr. Plumble consent to this reference, and do the same in the event of a similar result?

Upon this question of license I am not speaking without book, for I have had on several occasions before now to discuss these requirements with the superintending architect of the County Council in the case of some three or four of my establishments of baths and washhouses, and the general acceptable minimum of special arrangements necessary to meet these requirements, as stated by him, were in each case so reasonable and so manifestly necessary in the interests of public safety that they have been generally adopted by me in my subsequent plans for these buildings. This claim should surely justify me in respectfully pressing my claim upon the commissioners.

Baths Commissioners now universally recognise the fact that the letting of one or more of their swimming-baths during the winter months is a necessary and legitimate source of income, and, therefore, the adaptability of such swimming-baths for entertainment purposes has become one of the most important questions in the arrangement of these institutions; and at all of the public inquiries held by the Local Government Board upon the establishments erected, and about to be erected from my plans (some 15 inquiries in all), this question of adaptability for public entertainment has invariably been gone into; and I may mention, moreover, that upon the representation of the collective bodies of Baths Commissioners of London, the County Council have included in their new Bill, now before Parliament, one for the repeal of Section 5 of the Baths and Washhouses Amendment Act, 1878, which practically prohibits the commissioners from applying for such license; and it is, moreover, certain that this portion of the Council's Bill will pass and become operative within the next six months.

It is true that the County Council have discretionary powers as to how far the requirements in their regulations of February, 1892, should be

met in their adaptation to baths and washhouses; but I feel convinced that such powers will not be exercised in the direction of permitting any such arrangement of staircases and exits as shown (nor any slight rearrangement of the same). I feel confident that my plans would meet the acceptable proportion of these requirements as they stand; but I prefer, as I have already said, to do something better than simply to contradict an architect of Mr. Plumble's high repute and skill, and hence my respectful challenge.

Mr. Plumble states that neither I nor any of the competitors have absolutely complied with all the rules and regulations of the competition. It was simply impossible to do so! and consequently upon more than one point I and the other competitors are, no doubt, *technically disqualified*. For instance, the condition as to cost and accommodation absolutely in itself disqualified the competitors all round, for it is not possible to provide the accommodation asked for, finished and fitted in accordance with the conditions, for the sum of £30,000; and the persistence in a statement that it was practicable could have but one result in the mind of an honest competitor—viz., as the amount of accommodation could not be given for the sum to be expended, some of it must be cut out, and when the portion so deleted was in itself unnecessary, I submit this was the proper treatment of such conflicting conditions. For this reason I reduced the length of the first-class swimming-bath by 2ft., and that of the second-class bath by 1ft., at the same time omitting the end dressing-boxes in the case of the latter. I also omitted one or two items of accommodation that in my opinion were uncalled for, and introduced new ones that were required from the most recent experience of this class of work. I do not think it is quite right to say that a competitor is disqualified because he adopts the only possible course in such circumstances. Upon the question of cost of this description of building, I think I may fairly claim to know better than Mr. Plumble, considering that I have had some fifteen or more years' practical experience in their planning and erection, and that as arbitrator and consulting architect to corporate bodies, and as direct architect by appointment to many of these institutions, I have controlled the spending of something like \$254,000 upon Metropolitan and provincial baths and washhouses. Mr. Plumble, I know, has, in conjunction with two other architects, carried out so much of the Battersea Baths as is now erected, and has possibly some work of the same kind now in hand; but, with all due respect to him, I think that your readers will consider I am very probably the better judge upon the question of cost, and that I did not unnecessarily come to a conclusion that technically disqualified me, incurring by so doing some risk of losing my chances in the competition. I believe I am right, therefore, in saying I ought not to be disqualified in taking the spirit of the conditions rather than the letter, in such a case of impracticability of agreement between cost and accommodation as this. The commencement of the schedule was as follows:—

*Schedule of accommodation required as far as the space and proposed expenditure will allow.* By this clearly it was open to the competitor to cut his coat according to his cloth, and in my report I submitted my design in conformity with this condition. The conditions and schedule were issued in May, 1895, but in an addendum to these conditions issued on July 4, it is attempted to nullify this condition by stating that:—"It is believed that an ample sum has been provided for the buildings with the accommodation required in the schedules. The head note does not qualify Section 7 as regards minimum areas. A design not giving the minimum areas will be disqualified. The areas may, of course, be increased if cost is not exceeded."

I thought then, and think now, that it was not open to the promoters of this competition to change such a vital condition at such a late date, and I felt bound to ignore it myself. Mr. Plumble has not disqualified me under this last clause, or why have I two premiums awarded to me? It, therefore, appears to me that I am not disqualified in such a manner as to preclude my right to appeal from a sentence against the weight of evidence, especially upon a strictly legal point, and that I am entitled to claim the reference I ask for.

The quadrangle arrangement appears to be simply indispensable for baths abutting on to such crowded streets as the proposed buildings and with so small a direct frontage: it enabled



me to solve the question of cost (with other means already stated) by the avoidance of long and devious corridors, with the additional advantage of great simplification of the plan, and effecting considerable saving in the cubical contents of the buildings; and, moreover, enabled me to provide other and absolutely necessary items of accommodation that are quite new and unknown to many, and were certainly not indicated in the schedule of accommodation, which was very full. This quadrangular treatment also reserved to the commissioners the opportunity of providing at some future time a separate women's swimming-bath, which I felt ought not to be lost sight of, and it appears very doubtful to me if the Local Government Board will favourably entertain the purchase of the corner public-house for this purpose, either under the Michael Angelo Taylor's Act or otherwise.

I ought, in justice to myself, to say that really the abnormally great amount of details called for by the conditions determined me in my own mind that I could not afford to publicly show so much, and I stated in the first lines of my descriptive report, that my plans were submitted for the first premium in each case, meaning thereby that I did not desire, in the event of qualifying for a minor premium, of being awarded it, and so have to exhibit my drawings. I think it is to be greatly regretted that the assessor did not have regard to this request by leaving me out of the competition altogether. Clearly, too, someone else of more importance also declined to exhibit his plans, and in order to carry out the resolution of the vestry at their last meeting, they will have to be sent in again for reconsideration, although I feel I am entirely at the mercy of the sense of justice of the commissioners for a similar opportunity, as I believe they have rather resented the withdrawal of my plans.

I do not know if I have justified my action in this matter to the competitors generally; but it has appeared to me, after reflection, that a competitor should reserve the right to himself to withdraw from an exhibition of his designs, more especially as no mention is made in the conditions that he will be expected to exhibit his work as in this case. Had I thought that a public exhibition of designs had been intended, I should certainly have avoided showing so much of the details of my work in both drawings and description, even although it was absolutely required by the conditions. I should be glad, now, to have some expression of opinion from you in this matter.

I very greatly regret the necessity of entering into a correspondence in this form with Mr. Plumbe, who has been to me one of the best friends a young architect ever had; but I feel that the somewhat ungenerous insinuations contained in his two letters to the commissioners, more especially in the second one (which I now ask to be published), is undeserved, and is, moreover, unworthy of the high esteem and regard we have had for each other for nearly twenty years. Mr. Plumbe has on frequent occasions most generously borne testimony to my pretensions as an expert in this class of work, and I think his reference to them, in the second letter to the Shoreditch Commissioners, is unjust.—I am, &c.,

A. HESSELL TILTMAN.

#### MUNICIPAL BUILDINGS.

SIR,—In the paper on this subject, read to the Architectural Association, Mr. H. T. Hare's remarks on the plan submitted by us for the Sheffield Municipal Buildings, though flattering to us, and for which recognition we have to thank him, are in some respects not accurate.

His statement that "to adopt it strictly would usually involve increasing the number of stories to an undesirable extent, as was the case in question," can be seen to be not correct by reference to the specification for our patent, wherein is shown a plan for no less than six departments on one floor; and, as a matter of fact, we had designed several plans for the Sheffield Municipal Buildings with three departments on each floor, and with consequently one story less in height than the one submitted, and our chief reason for submitting the plan with two departments on each floor, and with the additional story, was to keep strictly within the condition as to cost, by the saving of about one-third of the extent of foundations and of roofing.

We have read with interest the other remarks of Mr. Hare, and agree with him in many respects; but neither he nor the other gentlemen present at the meeting appear to have touched upon one

point which we have thought of great importance—namely, the desirability of not making the offices of a greater depth than 21ft. from the front windows, if they are of an ordinary height and are to be sufficiently lighted. It is remarkable that this point is so generally neglected in municipal buildings, when it is so well known a requirement in school planning.

If you will permit us the remark, we may say that since the publication of our plan, in examining several designs for other municipal buildings published in the professional papers, we have been flattered and somewhat amused to see the efforts which have been made to arrive at the same results without directly copying our plan.—We are, &c., FLOCKTON, GIBBS, AND FLOCKTON. Sheffield.

#### HIGH ART WHEN ADAPTED TO ARCHITECTURE.

SIR,—We hear from time to time what a grand thing it would be for architects and architecture generally if Royal Academicians and people of that ilk would for the nonce come down from their high estate, and work, shoulder to shoulder, with the profession in decorating our public buildings and churches. But is it not probable that the lamentable ignorance of these bigwigs in ordinary matters of everyday detail would often mar more than otherwise that which their talent is expected to beautify? Apt illustrations, and to the point, are the wall paintings in the Hôtel de Ville at Paris, by P. V. Galland. They represent operatives at work at various building trades. The pictures in question are at present being reproduced by one of your contemporaries, and this week the cartoon is supposed to represent the bricklaying craft. The chief operative in the group is, however, shown building a brick wall with his finger-tips, quite innocent of either mortar or trowel. Nor is the presence of either such necessary accessories to the craft even suggested by the artist upon the scaffold. A rope, that runs down from around a pulley-wheel (the latter placed in an impossible position at the end of a ledger), goes nowhere, and where it should be seen below the crouching figure of a ladder-ascending labourer (who has evidently got the sack!), no such line is shown.

Give us "high art" by all manner of means, should it be worthy of the term; but if it is to go happily hand and hand with architecture, its votaries must not show by their drawing that all their observation has not taught them the proper way to tie a scaffold rope!—I am, &c., January 17. AN ART WORKER.

#### WASTE HEAPS.

SIR,—Wherever one travels, the eye is met with waste heaps of one sort and another. These heaps not only detract from the beauty of the landscape, but are a national loss in being allowed to cover land, often acquired at a ruinous cost when in or near towns, and carrying nothing but dead weight in the form of unproductive capital and interest of money, to say nothing of inconvenience caused by occupying so much space.

It was under circumstances similar to these that the writer was obliged some years since to face the matter, and "do something" to cope with two large heaps at Weston, near Bath—one composed of small lime, the other of engine ashes. Carting these small hills meant a great expense, and the writer was fortunate in coming across a concrete brick, which he had made as an experiment some eighteen years before by compressing some rough underground lime and clinker through a brick machine.

After further trials with the waste, the manufacture of bricks and blocks was adopted with the following satisfactory results:—

1. The waste has been utilised.
2. A considerable profit made by the manufactured materials.
3. Plenty of space reclaimed for business development.

So far for the history of the useful adaptation of the principle by the writer.

The writer's method for the utilisation of waste heaps generally consists in the formation of a concrete made with blue lias or other hydraulic lime, mixed in certain proportions with either of the following refuse—namely, destructor ashes, clinkers, chippings and dust from stone, hard sand, colliery tipplings, scavenging refuse, &c. The mixture is shovelled into troughs divided into sections, and afterwards passed through a

brick press. The blocks are made of the same materials in moulds or jackets, the unbinding of which prevents the setting from being jarred, and preserves the corners of the blocks from injury. The manufacture is completed by stacking and drying the products in the open air, and the costly parts of ordinary brickmaking—viz., setting, burning, and drawing—are entirely dispensed with. The size of the bricks is the ordinary one—the "blocks" are 9in. by 9in. by 12in., and, for the purpose of breaking the joints in masonry, some are made 9in. by 9in. by 6in. The blocks are very economical in use, not requiring to be pressed, and much more quickly put together than bricks. The proportions differ according to the quality of the lime used. Ashes, large and small, are added, and water; care should be taken not to use too much water, so as to prevent the hydrate of lime from being washed off, and to insure the lime crystallising. The use of a machine mortar-mill is far preferable to hand work, the result being the more thorough mixing and grinding. The time necessary for hardening is usually two months, when products may safely be removed and used.

The writer is frequently asked as to the crushing and breaking resistance of these bricks, &c. They are on an exact parallel with "very energetic mortar"—described by Vicat as capable of setting from the first to the third day, and acquiring after twelve months a degree of hardness equal to that of a good brick. By colliery "tipplings" is meant the shale known in different districts as "bind," "waste," &c.; but that which has been fired, either by hot ashes thrown on the shale or ignited by spontaneous combustion, is to be preferred. It will be seen from this description that the bricks and blocks contain no deleterious matter, and, therefore, are thoroughly sanitary. No germs of disease can possibly thrive in a mixture of destructor ashes or burnt colliery "bind" and lime, and it may be justly claimed to be a building material complying with all known health requirements. The very fact of lime hardening by the absorption of carbonic acid proves its tendency to improve the surrounding atmosphere.

A word upon the subject of new *versus* old lime may perhaps not be out of place. The practice of using lime hot from the kilns cannot be too strongly condemned, as the mortar made therefrom is very liable to crack and perish. The writer would be very sorry to suggest a revival of the old Roman law which, according to Pliny, made it a penal offence for anyone to use lime which had not been slaked three years; but, judging from a considerable experience, he unhesitatingly asserts that the older the lime is, the better is the work, and the sooner the notion that fresh lime makes the best work is dispelled the better for all concerned.

Touching upon the point of durability, the old proverb, "Lime is but a child at 100 years," remains unshaken, as proved by the amazing strength of the mortar, made by the Romans, to be seen at the old baths in the city of Bath. The writer would like, in conclusion, to throw out a suggestion to those having the management of collieries as to the suitability or otherwise of making props of this material, to take the place of pitwood to some extent. If the process be successful for building houses, why not for concrete pillars for mines? Any damp arising would strengthen concrete props—the nature of hydraulic lime lending itself to hardening. Some blocks now before me are not three months old, and yet, even at this early stage, they will together bear up 30 tons weight in a building.

To those who desire—

- (1) Further development of their resources.
- (2) The accomplishment of true economy in using up waste.
- (3) The employment of home labour.
- (4) The saving of railway carriage.
- (5) Supplying workmen with substantial and healthy homes.

(6) Restoring fields to their former verdure. (7 and lastly) A gold mine above ground and close at home—the writer most respectfully recommends the process he has described.—I am, &c., JOHN T. FRYER. Locksbrook Mills, Bath.

#### FIREPROOF FLOORS.

SIR,—In his paper on "Municipal Buildings," read before the Architectural Association on January 10th, and reported in the BUILDING NEWS, Mr. Hare stated that "the number of



rival systems of fireproofing now in the market are rather bewildering; but the cheapest, simplest, and oldest is the best—i.e., rolled iron or steel joists from 3ft. to 6ft. apart, with cement concrete filling covering the ironwork above and below at least 1in. It would have been more satisfactory if Mr. Hare had given his reason for forming this conclusion. It would undoubtedly have elicited some interesting correspondence and useful information. As a matter of fact, the question of what system of fireproofing floor is the best is as undecided in most persons' minds now as it was twenty years since.

We have sometimes been told that iron and steel beams should be avoided, because, when a fire occurs, their expansion from heat is so great that the walls are pushed out, and a collapse of the building is the result; and that, instead thereof, we should use concrete only, as the Romans did for many of their floors. But the Romans built their walls so thick that the amount and weight of concrete employed for floors was of but little consequence, so that almost any span was practicable.

This, however, is impossible with modern buildings, and as iron or steel beams appear to be almost a necessity for floors of considerable span, it becomes a question as to what are the requirements of fire-resisting, or so-called fire-proof, floors, and how far the plate or slab system which Mr. Hare recommends meets these requirements.

In the first place, the beams or joists should be protected as much as practicable, more especially the bottom flanges, because they have to bear by far the greatest strain; the top flanges, being under a compressive strain, have but little to do in comparison. When a fire takes place, the joists maintain their normal strength, until a temperature of 500° Fahr. is reached, after which the strength begins to decrease very rapidly. In the plate system, with, say, an inch of concrete below the bottom flange, there is practically no guarantee of any protection whatever; for, as concrete expands with heat (as well as the joists), rupture in case of a fire occurs sooner or later at its weakest part, and in this case it is the inch in thickness below the bottom flanges, which is merely a fragment held in place by the greater mass on either side, for there is little or no adhesion to the iron itself. True, there is the plastering mortar on the concrete; but as the concrete possesses no key, the usual hacking of the latter as a substitute affords but little hold when a fire occurs, and the plastering mortar soon succumbs and falls away. The suggestion is therefore that the bottom flanges of all beams and joists should be protected from the effects of fire in as safe a way as possible, even at the cost of some increase of floor depth if necessary, and this the slab system does not admit.

The next important point is to obtain a maximum of strength with a minimum of materials, that the walls and foundations may not be unnecessarily loaded. Assuming that a floor of 18ft. to 20ft. span, where no main beams are permissible, has to be constructed as Mr. Hare suggests, and a safe live load of only 1cwt. per foot is specified, steel joists at 5ft. apart would require to be at least 9in. or 10in. deep, and with the concrete (allowing an inch in thickness over and under) there would be a dead weight on the walls of at least 8cwt. for every superficial yard of flooring. Surely a floor which requires 8cwt. of materials in construction to support an estimated load of 9cwt. cannot be the best system yet devised? As a matter of fact, one-third of the same concrete, if distributed in a suitable form, would safely carry double the weight assumed to be necessary. Experiments have conclusively proved that a flat slab or floor of concrete is its weakest form, and that the portion below the neutral axis, being in tension when the floor is loaded, gives practically no increase of strength whatever. Practically, what it amounts to is, that the concrete of a slab-floor has to be 2in. more in depth than the joists which support it, and the depth of the joist has to be regulated by the span. Whether required for strength or otherwise, there is, therefore, with a slab floor, the great disadvantage that a larger amount of concrete has to be used than is often necessary—not for strength, but simply as a filling-up material.

Then sound is another important factor in connection with concrete floors, and the better the concrete the better conductor of sound it becomes. The thickness of a concrete floor has but little to do with checking the passage of sound; a 12in. wall seems to pass it almost as well as a 6in., and

trials in that direction have proved that ordinary conversation carried on in a room divided from another by a 6in. concrete wall could be repeated in the latter. As a matter of fact, unless there is an uninterrupted air space between a concrete floor and a suspended ceiling beneath, it is impossible to prevent ordinary sounds from passing from the room below to the room above.

On the other hand, what are the advantages of a plate or slab floor? So far as I know, only the cost, and this is so little now that practically it does not stand in the way of any better system. It has been said that the large amount of concrete used in slab floors brings about one advantage—viz., that the excess of strength gained in this way renders them absolutely safe from collapse. Singularly enough the reverse is the case. All serious accidents that I can call to mind have occurred with slab floors or roofs of considerable thickness, and none from the numerous patented systems. Mr. Hare refers to a floor which fell at Portsmouth in 1876, killing four persons, and which was 12in. thick; and the floors and roof which collapsed at the Anatomy School, Cambridge, in 1878, were of slab form and of considerable thickness.

Mr. Baldwin Latham, C.E., in his report on this accident, said:—"Concrete floors between girders should be cambered or curved, so that the strain may be in compression, and not in tension."

As showing the widely diverse opinions held with regard to the construction of fireproof walls, it may be noted that Mr. Hare says, "A floor of this kind (slab floor) forms an immensely strong tie to the building at each floor level." Mr. Latham says, "It is undesirable that concrete floors should be made to adhere to the walls, but as far as possible the concrete should be independent thereof," and he gives reasons for this.

It was reported not very long since that the American Government were about to make a series of experiments to determine the kind of floor that was the best; the Royal Police Fire Brigade of Berlin did so in 1893, with some remarkable results. If our own Government were to set apart some portion of existing buildings about to be demolished for a similar object, more might be learnt about the fireproof floors in one day than has been possible for years. But trials should be made of floors not less than 400 superficial feet. The trials we read of occasionally, where some new kind of floor, say 8ft. square, was severely tested, are no criterion whatever.

It is not the resistance to fire of certain materials alone which has to settle the question, but the expansion and contraction in areas of considerable size.—I am, &c.,

39, Victoria-street.

THOMAS POTTER.

The memorial stones of a new Baptist church for Bootle were laid on Monday. The main entrance will be in Stanley-road, and the building will embrace a nave, aisles, and north and south transepts. The total length will be 68ft., and accommodation will be provided for 340 worshippers in the body and 120 in an end gallery. Romanesque is the style adopted, and the cost will be £2,708. Mr. W. Hall, Christian-street, Liverpool, is the contractor for the whole works, which will be carried out from plans by Messrs. R. Owens and Son, architects, of Liverpool.

Mr. Thomas Howard, M.I.C.E., who was for many years engineer to the Bristol Docks Committee, died on Sunday at Weston-super-Mare, in his 80th year. Mr. Howard was formerly associated with Mr. Blackwell, who had been the adviser of the corporation in dock matters, and when Mr. Blackwell left, to take up an appointment in Canada, it was decided to appoint a docks engineer, and Mr. Howard received the appointment, which he held until about 12 years ago. His valuable reports on the dockification of the river and the prevention of floods have been frequently referred to by engineering experts, who have since been called in to advise the corporation. When Mr. Howard resigned his position as engineer to the docks committee his services were retained for some time for purposes of consultation.

In the parish church, Pendlebury, a reredos has recently been erected to the memory of the late Mr. and Mrs. John Knowles, of Westwood. It is in the form of a triptych, constructed of oak, from a design by Mr. W. D. Carö, M.A., architect to the Ecclesiastical Commissioners, and President of the Architectural Association. Mr. Lees Knowles, M.P. (who has borne the cost of the memorial), has also embellished the church by new marble steps to the sacristy and by new altar hangings, besides providing the design by Mr. Carö for the decoration of the ceiling, recently executed.

## Intercommunication.

### QUESTIONS.

[11474].—Cheapside Cross.—Where did this cross (an Eleanor one, I believe), stand? Was it at the St. Paul's or Royal Exchange end of Cheapside?—READER.

[11475].—St. Machar.—What is distinctly known about this (Scott's?) saint?—READER.

[11476].—Furniture Warehouse.—Will any correspondent give useful information for preparing plans and specification for a furniture warehouse? I purpose putting 7in. by 3in. deals laid flat on sleepers about 6ft. apart to ground floor, as a good substantial floor; steel stanchions, girders, wood joists; first floor, 4ft. span.—FURNITURE.

### CHIPS.

A quaint block of half-timbered buildings which has stood at the bottom of Digbeth, Walsall, for something like four centuries, and which has been reproduced in photographs, etchings, engravings, drawings, and paintings many times and oft, has during the last few days been entirely swept away to make room for an arcade which is to run from Digbeth into the bottom part of Bradford-street.

Creditors of Jas. Julian, contractor, Truro, met on Monday last in that city. The deficiency was authoritatively stated to be a little over £4,000.

A new east window has been erected in All Saints' Church, Micklethurst, Cheshire. The subject is "Our Saviour being led away to be Crucified." A feature of the window, which has been executed by Messrs. Jones and Willis, of Birmingham, London, and Liverpool, consists of the number of figures introduced. The tracery portion is filled with representations of SS. Peter and Paul, Augustine of Canterbury, and Wilfrid of York, with SS. Alban and Chad.

New public baths are about to be built in Holbeck-lane, Leeds, at a cost of about £3,000. Mr. W. Hanstock, of Batley, who was also the architect of the other groups of baths in the same city, has prepared the plans.

Mr. Pordage has been appointed fire-master (*Anglicus*, superintendent of the city fire brigade) under the Edinburgh corporation, in succession to Mr. Wilkins, resigned.

The trustees are carrying out some minor alterations at New-place, Stratford-on-Avon, the last home of William Shakespeare, which will improve the appearance of the gardens. The estate, now in the ownership of the trustees, was originally divided, and, although it has long been thrown together, the disposition of the shrubs, greenhouse, &c., has always given it a conspicuously divided appearance. These are now being removed, and the famous grounds will present for the future an open sweep throughout.

The Okehampton Board of Guardians have adopted plans by Mr. H. Geen for a new work-house infirmary, to be built at an estimated cost of £3,000.

The will of Mr. Thomas Cundy, F.R.I.B.A., of 8, Chichester-terrace, Brighton, has been proved, the value of the personal estate amounting to £54,317.

As part of the national harbour scheme at Dover, the surveys for which are now advancing towards completion, the War Office authorities have decided to further strengthen the military fortifications by the construction of two or three forts on the heights to the eastward of the town. Two forts are to be commenced at an early date on the cliffs, near the site of the convict prison, from which position they would command the narrowest parts of the Straits of Dover.

New board schools are being erected at Ponty-mister, Mon., and special attention has been paid to the ventilation, which will be carried out on the Boyle system.

The new schools, Craven Arms, Shropshire, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The engineer to the scheme for bringing sea-water from Lancing to London has prepared, for the information of Parliament, an estimate of the entire cost of this scheme. He states that the works contained in the Bill can be carried out for £450,000, which includes the acquisition of all the necessary lands for the distribution of sea-water throughout London.

St. George's new schools, Wigan, which have been erected at a cost of £6,000, were formally opened by Lady Powell on Friday.

Mr. H. H. Collins, district surveyor for the eastern division of the City, has been elected the president of the District Surveyors' Association, in succession to Mr. J. Douglass Mathews.



## Legal.

### HOUSE-DUTY AGAIN.

WHERE any house shall be divided into and let in different tenements, and any of those tenements are occupied solely for the purpose of trade, they are exempt from the inhabited house duty. But this exemption only applies when the landlord so divides and separates the house into different tenements and lets them as such, and it does not include the case of a subletting, even though there is a similar separation. This point was laid down in a recent case arising out of a house and shop in the Stroud-green-road, leased to the Home and Colonial Stores, Ltd. (*Times*, Jan. 16). The company paid £80 a year, and the whole premises were assessed to the Queen's Taxes at £100. As the company only wanted the shop, they screwed up the door communicating from thence to the passage and sub-let the floors over, and, in fact, the whole of the rest of the house, with side entrance included, to a tenant at 15s. a week, including rates and taxes. The point now at issue was whether the company, as tenants of the whole house and shop, should be rated at the full value of the premises—i.e., £100 a year—or at £32 a year, the assessed value of all except the shop, and so at 3d. in the £ instead of 6d. The Commissioners reduced the amount to the lower sum; but the surveyor now appealed, and was successful.

The judges of the Divisional Court held that as the whole house was let to the company as one tenant, the exemption could not apply, because it only affected cases where houses were divided and let by landlords in separate tenements. The company took the premises, and wanting only the shop, they sub-let the rest, which, by division, they had made a separate tenement. If the landlord had done this, then the shop would have been exempt, and the rooms above alone rateable; but this result could not, under the present Act, be brought about by subletting. The Court admitted that they would have held the screwing up and non-usage of the door from shop to passage to be a sufficient separation of the premises, and they intimated that a structural division was not essential. But the result is, that if a shop or a separate tenement is to be exempt from House Duty, it must be separately let as such by the landlord.

FRED. WETHERFIELD, Solicitor.

### 1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

**U. D. C.—TOWNS.—BUILDING ACTS.**—I really cannot say what local or special Acts have been passed in relation to building. Perhaps the Local Government Board could help you.

### CHIPS.

New fortifications are being constructed at Calshot Castle, on the Solent. Messrs. Playfair and Toole are the contractors.

Mr. Pittendreich Macgillivray, A.R.A., Elinburgh, has just completed a mural tablet with three-quarter profile bust, to be placed over the grave of the late William Alexander, LL.D., in Nellfield Cemetery.

The Old Farm House public-house at Southampton, a hostelry built in 1611, is about to be demolished and rebuilt.

The Royal Institution of Painters in Water Colours have reduced the number of works allowed to be submitted by outsiders to two each.

The theatre at West Bromwich, which was lately destroyed by fire, is about to be rebuilt from plans by Messrs. Owen and Ward. The contract has been let for £5,000, and the building will accommodate some 2,000 persons. The pit will be brought to the level of the ground floor, and there will be two tiers only, instead of three. There will be a separate bar for each floor, but persons sitting in the bars would not be able to see the performance.

The organ of Totnes parish church having been rebuilt and renovated by Messrs. Hele and Co., of Plymouth, special dedication services were held yesterday (Thursday).

At the general meeting of the District Surveyors' Association, held on the 16th inst., Mr. H. H. Collins, F.R.I.B.A., F.I.S., district surveyor for the eastern division of the City of London, was elected president, Mr. J. D. Matthews retiring.

## LEGAL INTELLIGENCE.

**SUCCESSFUL APPEAL AGAINST A MAGISTRATE'S DECISION.**—The case of the Metropolitan Industrial Dwellings Company, Limited (appellants), v. Mr. W. Slade (respondent), heard at the County of London Sessions on Friday, was an appeal against an order made by Mr. Wyndham Slade, the senior magistrate at the Southwark Police-court, at the instance of the St. Saviour's Board of Works, requiring the appellants, who are the owners of blocks of industrial dwellings known as Mowbray-buildings, Rsdcross-street, Borough, under the Public Health Act, 1891, to make certain alterations to render the premises fit for habitation, so as not to be injurious and dangerous to health. The contention of the appellants was that the magistrate was induced to make the order under a misapprehension of the facts and the actual requirements of the Act of 1891, and they called Mr. Banister Fletcher and Mr. Philip Edward Pidditch, architects, who stated that the order was unnecessary from a sanitary point of view. Professor W. H. Corfield traversed the evidence of Dr. Heron, the medical officer of the St. Saviour's District Board of Works, that the buildings were in an insanitary condition, and also supported the views of the architects called by the appellants, that the orders made in respect of the structural alterations and the necessity for another class of sanitary appliances were not required to make the dwellings more healthy. Sir Peter Edlin said the Bench had come to the conclusion that the order must be annulled. He thought if the learned magistrate had heard the exhaustive and positive evidence given on behalf of the appellants, he would not have made that order. The order of the Court below was, therefore, annulled, the appeal being allowed, with costs, to be taxed by the Clerk of the Peace.

**ARCHITECTS' FEES FOR PARTY-WALL.**—**Selby v. Briggs.**—At the Shoreditch County-court on Tuesday, before Judge French, Q.C., Mr. Selby, an architect and surveyor, sued Messrs. J. C. Briggs and Son, tobaccoists, of High-street, Shoreditch, for £51 2s. 6d., due to them under a contract. The plaintiff was an architect and surveyor, and the defendants were owners of 201, High-street, Shoreditch. Some time ago their next-door neighbour, a Mr. Simmonds, had, under the Dangerous Structures Act, to rebuild a certain party-wall. Plaintiff was consulted by Mr. Simmonds with regard to carrying out the alterations, and he pointed out that the wall, which would require to be rebuilt, was a party-wall. He accordingly informed defendants that it would be necessary for them to share in the rebuilding of the wall. They agreed to bear their share in the rebuilding, and later on the defendants promised to pay half the amount of Messrs. Keble and Co.'s tender in carrying out the work, and pay half of the plaintiffs fees, £7 7s. for superintending. The defence was that the plaintiff had no right to sue; the proper party to do so being the building owner under the Act—that is, Mr. Simmonds. Defendants also alleged that the wall was not built in accordance with the provisions of the Building Act. His Honour pointed out that defendants agreed to waive the Building Act to save expense. If there was any injustice likely to be done he should use his authority, and add Mr. Simmonds as a party to the action. After hearing further evidence, his Honour pointed out that as plaintiff had paid Keble, he was an agent of Simmonds's, with a pecuniary interest, and he was entitled to sue the defendants. There was no necessity to amend the claim by adding Simmonds's name. Professor T. Roger Smith, F.R.I.B.A., having corroborated plaintiff, the judge gave judgment for the full amount claimed, with costs.

**SOUTHGATE V. HUNT.**—At Shoreditch County-court, on Tuesday, Jan. 21, before his Honour Judge French, Q.C., a Hoxton builder named Southgate sued Henry Hunt, the tenant of a house at Fairbank-street, New North-road, for £10 4s. 6d. for work done and materials supplied. Mr. Grosor appeared for the plaintiff; defendant was unrepresented. Defendant paid £2 15s. into court, and disputed giving any order for the remainder of the work. Plaintiff's case was that defendant called on him and asked him to give an estimate for certain repairs to a drain on his premises. Plaintiff said the work would cost £2 15s., and was told to start upon it. He did so on a Monday. The same day a sanitary inspector of the Shoreditch Vestry called, and said a lot more work required to be done. This work was executed with defendant's sanction, and plaintiff now sued for the cost. Defendant denied that this extra work was done with his sanction. It was not till the following Wednesday he knew that this extra work was wanted. Plaintiff was only 63 hours on the job altogether; therefore he must have done nearly all of it before communicating with him. When told of the inspector's orders, he said he would have to come to terms with his landlord before agreeing to have it done. After hearing the evidence, Judge French said it seemed to him the case was very clear. The inspector had ordered certain additional work to be done, and plaintiff had carried this out without consulting defendant, thinking that the inspector's

orders were sufficient. They were not. The inspector could serve a notice on a tenant to do certain work, but could not tell a builder to do it. If the notice was not complied with, then the proper steps at law would have to be taken. Plaintiff had made a mistake in accepting the inspector's order, and would have to put up with it. Judgment would be given for the plaintiff for £2 15s., paid into court, and he would have to bear the costs of the action.

**CUBITT V. DICKEE.**—This case, of some importance to members of the profession of architects and surveyors, was heard at the City of London Court on the 16th January inst., before the Assistant Judge and a jury. It was a claim by Messrs. Cubitt and Collinson, of 2, Broad-street Buildings, E.C., architects and surveyors, for £37 rendered for professional services rendered in connection with the alteration and rebuilding of the public-house known as the Rose and Crown, Dorset-street, Whitefriars, there having been two contracts, which together did not reach £500, and the question was, whether the plaintiffs were accordingly entitled to commission at the rate of 7½ or 5 per cent. The scale of the Royal Institute of Surveyors was quoted in support of the plaintiffs' claim. The plaintiffs proved that they had prepared several extra plans, and had measured up the premises, which were old buildings, without any extra charge. Mr. Henry Kisch (instructed by Messrs. Richardson and Carn, of 2, Broad-street Buildings, E.C.) appeared for the plaintiffs, and Mr. Forbes Lancaster for the defendant. Mr. Albert E. Pridmore, M.S.A., F.S.I., surveyor to the parish of St. Botolph, Bishopsgate, and Mr. Alfred Frampton, A.R.I.B., F.S.I., supported plaintiffs' evidence, and explained that where the alterations are effected whilst the business is being carried on, the work and responsibility of the builder and architect are much increased. In their opinion as experts, in view of the difficult nature of the work, the commission claimed was very moderate, and they stated that, according to the custom of the profession, where the cost of the works was under £500 the commission increased up to 10 per cent. when the cost reached £100, and that the medium charge of 7½ per cent. was, under the circumstances, fair, reasonable, and usual. The defendant, moreover, alleged that the plaintiffs specifically agreed to accept commission at the rate of 5 per cent. only. She paid into Court the amount of commission on this scale. The jury ultimately found for the plaintiffs, and judgment for the amount claimed, with costs, was pronounced accordingly.

**AN "ARCHITECT" SENT TO PRISON.**—At the Central Criminal Court on Wednesday, before Mr. Justice Hawkins, Kent Pinchbeck, architect, was indicted for obtaining from Charles Eames and other persons large quantities of building materials by false pretences, and also for obtaining credit from those persons by false pretences. The case was begun last week, and was adjourned. In December, 1894, Mr. Charles Eames, a builder, received a letter from the prisoner, who was an architect having an office in Adelphi, asking whether he was prepared to tender for the erection of some houses which were to be built at Northwood, Middlesex. In consequence of that letter Mr. Eames had an interview with the prisoner, who represented that the houses were to be erected for a Mr. Miles Atkinson, and that he himself was Mr. Atkinson's agent. Mr. Eames entered into a contract for the building of two houses at Northwood for £1,030, and began to build them. When the first instalment under the contract was due, Mr. Eames applied to the prisoner for the money. The prisoner at first made excuses, but subsequently sent some money. Mr. Eames did work to the amount of £350 on the land; but as he could not get the money due to him under the contract, he refused to complete the work. Three other builders also received letters from the prisoner, and were similarly treated. It was stated that the prisoner had purchased the land at Northwood upon which the work was done, and that he granted leases of the houses and sold the ground-rents. There was an entry in his ledger, showing that he had received £3,280 in respect of the property and paid away £1,596. Technical objections to the counts in the indictment, made by defendant's counsel, were upheld by Mr. Justice Hawkins as to the first four counts, charging the prisoner with obtaining the building materials by false pretences. The prisoner said that Atkinson told him that he would buy the houses after they had been built. The jury found the prisoner guilty on the last four counts, which charged him with obtaining credit by false pretences, and Not Guilty on the first four counts. The prisoner was sentenced to 18 months' imprisonment, with hard labour.

Estate duty has been paid on £291,963 as the net value, the gross value being £312,078, of the personal estate of Mr. Charles Thomas Lucas, of the firm of Lucas Brothers, Great George-street and Belvedere-road, Lambeth, builder and contractor, who died on December 4, aged 75.



## Our Office Table.

A SEVERE indictment of "Defective Drains and Sewer Air as Causes of Disease" was made by Professor W. H. Corfield, Medical Officer of Health, St. George's, Hanover-square, in an address delivered before the National Health Society on Tuesday afternoon. The lecturer described instances in his own experience of outbreaks of disease caused in houses by an escape of foul air from the drains or sewers into them. Persons living in houses in which air was contaminated in that way suffered from general malaise. Sore throats were the most common result of breathing foul air, and examples were given, not only of families in which outbreaks of sore throat were caused by escapes of drain air into the house, but also of cases where the workmen employed in removing defective drains had suffered from sore throat. Incidentally it was also mentioned that sore throats were frequently caused by escapes of coal-gas. In many instances diphtheria had been attributed to similar defects, and it was so usual to find drain air escaping into houses where there were cases of diphtheria that the lecturer had come to the conclusion that, even if the diphtheria poison was not actually contained in such foul air, persons were, at any rate, predisposed to take the disease by sore throat being first produced. There was no doubt that diphtheria was largely spread directly from one person to another by contagion; but that was no reason why foul air should not be a vehicle for the dissemination of the poison of this disease. Blood poisoning was frequently caused in a similar manner. Pneumonia was also no doubt occasionally caused by breathing foul air, and diarrhoea was sometimes caused in the same way, especially in infants. Typhoid fever, although most generally caused by the drinking of contaminated water, was no doubt also frequently spread by means of foul air.

A MEETING of the committee of the National Association of Master House-Painters of England and Wales was held at the Colonnade Hotel, Birmingham, on Friday. Mr. J. Taylor (Birmingham) presided, and members were present from Newcastle, Bolton, Burnley, Liverpool, Manchester, Preston, Hereford, Nelson, Blackpool, Leicester, Nottingham, Huddersfield, Bradford, Hull, and Derby, the attendance numbering about 30. It was resolved to hold a large exhibition in Birmingham in October, in connection with the prize scheme for the promotion of technical education amongst painters, and a committee was appointed to carry out the necessary arrangements. A committee was also appointed to deal with the question of the more efficient training of painters, and the meeting adopted a form of indenture for apprentices, the revival of which it is desired to promote. The prize competition will be divided into two parts—examinatory (the examinations being conducted at the various local centres), on a common form of questions to be issued by the committee; and the exhibition of practical work in connection with the annual convention.

UNDER the auspices of the District Council for Edinburgh and the East of Scotland of the National Society of Plumbers, a lecture was given on "The Storage of Water for Domestic Purposes, Kitchen Boiler Safety-Valves, and Frozen Pipes," on Friday, by Mr. T. M. Ross, of Haddington, in the Philosophical Institution, Edinburgh. Mr. A. Allan, vice-president, was in the chair. The lecturer described the proceedings taken for getting in a pure and plentiful supply of water to town or village, and also the state of that water when it was brought to the consumers. It was delivered in a pure state, and contaminated in some of the cisterns. In many houses people thought they were secure when they got a draw-off tap from the main for drinking and such-like purposes; but then servants sometimes drew water from the cistern taps and put it on the table. To remedy this state of affairs, he advocated proper cistern rooms, where the cisterns could be seen to be dirty, and cleaned. As to kitchen boiler safety-valves, a great deal had been said about some as providing safety from kitchen-boiler explosions, which were really useless for that purpose. Such valves were advocated by engineers who had to do with steam fittings only, and who had no experience with kitchen ranges. Pipes in connection with kitchen-range boilers should be constructed in such a manner that they would escape frost. Those pipes ought to be, as far as possible,

in the same condition in the winter months as in summer, and if that were accomplished there would be no doubt about the safety-valve. Referring to the freezing of pipes, he denied that allowing taps to dribble would always prevent freezing, and said that if the pipes, instead of being cased, as they usually were in houses, were exposed on the outside of the plaster, they would be kept at the same temperature as the atmosphere of the room, and have less chance of being frozen.

FROM what we gather it is the practice of some municipalities in the United States to ignore engineers, and let contracts on plans prepared by contractors. Professor A. E. Phillips, of the University of Wisconsin, in a letter to the *Engineering Record*, gives an instance where a firm of contractors undertook to do all the engineering work necessary to carry out a system of water supply which was accepted by the authorities. Plans were even prepared, and contractors invited, but the contract was let to the firm that submitted the plans. Of course! The making of the plans secured the contract, though the price was some 10,000dols. in excess of what the system should have cost. Of course the superintendence was a mere matter of form—what else could it be? The *Engineering Record* comments on the case, and says truly the fitness of the plans and the efficiency of the work are matters left out as remote contingencies which another generation must pay for.

DESCRIPTIONS are published of the artesian wells which have practically created new provinces in Queensland. The first bore was begun in 1885, and after sinking to a depth of 663ft. a jet of water yielding 300,000 gallons daily shot up. Only nineteen bores have been made at the public cost, and private enterprise is responsible for 295, the total depth of these perforations amounting to about 83 miles. The water supply thus tapped is enormous. One bore alone yields 4,000,000 gallons daily, while the total annual flow of these bores is equal to seven and a half times the capacity of the water system which supplies Melbourne.

MR. A. S. COOPER, U.S. Asst. Engineer, in a letter to the *Engineering Record* controverting a statement made by a writer in that paper, states that, in the report of the chief engineer of the U.S.A. of 1894, the tables given of the cement tests "clearly show that dry mortars give better results than wet ones on short-time tests, and that the reverse is true on long-time tests up to a certain limit, which in the experiments referred to approximates an amount of water equal to about 45 or 50 per cent. of the cement used. The amount of water required for the water of crystallisation is from 25 to 30 per cent.—not of sand and cement, but of cement alone." Authorities have differed much on this question; experience has, however, generally shown that the stiffer the cement is gauged, the better.

THE proposed supply of sea-water for London was the subject of a paper read by Mr. F. Grierson before the Society of Arts on Wednesday night. Mr. Grierson described the scheme which will come before Parliament in the ensuing session, by which it is contemplated to construct conduits for the conveyance of sea-water to London from South Lancing, in Sussex. This scheme was not a new one; but somewhat similar but more limited powers were obtained a few years ago, though they were allowed to lapse. The present intention was to supply nine or ten million gallons a day. One of the main purposes for which sea-water could be usefully employed in London was for street-watering. As nearly as could be ascertained, about 40 million gallons in London of fresh water were now daily consumed for non-domestic purposes. This water had been filtered for drinking, but was nearly all consumed in requirements which might be satisfied by the use of sea-water. The cost of the complete carrying out of the project would be £450,000, and the works could be completed in about two years. He summarised the advantages of a constant supply of sea-water to London as follows:—(1) There would be less dust and smell and more cleanliness in the streets; (2) watering would be less frequent and more efficient; (3) the road surface would be more durable, requiring fewer repairs; (4) the sewers would be less offensive; (5) the cost to the ratepayers would be probably a quarter, or even a third, less than the present cost of water for public purposes; (6) hospitals and schools would be provided with additional aids to health; (7) every house could be furnished with its own sea-bath; (8) the saving of fresh water would be very great, practically adding

25 per cent. to the present supply. A discussion followed.

### MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—London and Provincial Builders' Foremen's Association. Discussion on "The General Foreman—from what branch of the Building Trade should he be selected?" Memorial Hall, Farringdon-street, E.C. 7.30 p.m.  
MONDAY.—Society of Arts. "Alternate Current Transformers," Cantor Lecture No. 2, by Dr. A. Fleming, F.R.S. 8 p.m.  
TUESDAY.—Society of Arts. "Stamboul, Old and New," by Richard Davey. 8 p.m.  
Institution of Civil Engineers. "Recent Developments in Gas-Engines," by Dugald Clerk. 8 p.m.  
Auctioneers' Institute. "Law and Practice of Compensation in the City of London," by H. C. Richards, M.P. 8 p.m.  
WEDNESDAY.—Society of Arts. "Standards of Light," by W. J. Dibdin, F.C.S. 8 p.m.

### WATER SUPPLY AND SANITARY MATTERS.

METROPOLITAN WATER SUPPLY.—The Water Committee of the London County Council, in a report presented to the Council on Tuesday, stated that the Bills of the different water companies had been reported on by the engineer; but the committee saw no reason to depart from the resolutions arrived at by the Council in February, 1896. They therefore recommended that the Parliamentary Committee, in conjunction with the Water Committee, be instructed to place before Parliament the views of the Council in favour of purer sources of supply, and, in doing so, to indicate the various sources of supply in Wales which had been under consideration. The proposed Welsh sources of supply were calculated to yield a daily quantity of 415 million gallons, and they naturally divided themselves into two nearly equal portions—one portion deriving its supply from the upper parts of the Wye and its tributaries the Ithon, Yrion, and Edw, together with the Towy, and the other from the Usk Valley and its neighbourhood. The amount of water that could be obtained from the four Wye sources would be about 200 million gallons a day (about equal to the present supply of all the companies). The Usk sources would yield 182 million gallons, the remaining portion of the 415,000,000 gallons mentioned being obtainable from the River Towy. As regards cost, the engineer's estimate worked out a little under £19,400,000 for the Wye portion of the scheme, and £17,500,000 for the Usk portion. The committee were of opinion that it was desirable to adopt the Usk portion of the scheme as a first instalment, leaving the Wye and Towy portions to be dealt with at a future date. Consequently they ask to be allowed to continue the surveys of the whole of the Welsh scheme which they were carrying out under the instructions of the Council, and to prepare forthwith for Parliamentary deposit in November next that portion of the project deriving its supply from the Usk areas with the necessary conduit to London. Whilst recommending the Council at the present moment to adopt a scheme only capable of providing 182 million gallons a day, the committee thought that provision should be made for purchasing such lands and rights as would insure to the Council the power of obtaining the additional water from the other areas mentioned, should it be required. Consideration of the report was adjourned for a week, as Sir Arthur Arnold, the chairman of the Council, has been asked to act as negotiator between the water companies and the Council, and he has accepted the invitation.

The Stamford Board of Guardians have decided to build a new workhouse, at an estimated cost of £12,000.

The engineers to the authorised Baker-street and Waterloo Electric Railway have deposited at the House of Commons an estimate of the cost of the proposed extension of this railway to the St. John's Wood terminus of the Manchester, Sheffield, and Lincolnshire Railway. They estimate that the further length of line required will be one furlong seven chains, and that the costs of construction will be £99,045. Of this sum, £62,563 will be expended in tunnelling, £15,000 upon the construction of a terminal station at Melcombe-place, and £12,000 upon the acquisition of the necessary lands and buildings.

New board schools have been built in Wattville-street, Handsworth, from plans by Messrs. Wood and Kendrick. Mr. J. Webb was the builder, and Messrs. Fisher and Son supplied the furniture.

At Friday's meeting of the Aberdeen Town Council, it was reported that the total valuation of tramway system, as assessed by Mr. Y. uog, Glasgow, Mr. Dyack, the burgh surveyor, and Mr. Wilson, architect, was £62,329. The sum is £14,000 less than the Tramway Company's own valuation.



**STATUES, MEMORIALS, &c.**

**EAST BRENT.**—The restored churchyard cross of St. Mary the Virgin, East Brent, was unveiled and dedicated on Saturday by the Bishop of Bath and Wells, as a memento of the jubilee of the venerable Archdeacon Denison's association with the parish. Up to the top of the die, beneath the main shaft itself, the whole of the masonry is ancient 15th century work. These medieval remains, which stand 6ft. out of the ground, are illustrated in the late Dr. Pooley's "Old Stone Crosses of Somerset" (1877). Mr. Edmund Buckle, the diocesan architect, prepared the designs, and the work was entrusted to Messrs. Harry Hems and Sons, of Exeter. The entire structure is fully 25ft. in height. The new work is entirely of Douling stone. The shaft is an octagonal monolith. Above projects a groined capital, traceried and ornamented at intervals by the Glastonbury Tudor rose, which in turn supports a canopy composed of eight groined and carved niches, each filled by a statue, representative of the following:—St. Andrew, the patron of the diocese; St. Peter and St. Paul, the tutelaries of Bath Abbey; St. Benedict, the founder of the Order responsible for the building of the church; St. Joseph of Arimathea, a sprig of whose miraculous thorn flourishes close by; St. Dunstan, Abbot of Glastonbury; the present Archbishop of Canterbury, and the Venerable Archdeacon Denison. The sculpture and masonry are carved out of one large block, none of the figures being put into their respective niches separately. The whole is surmounted by an effectively-carved cresting of 15th century West-country type. Above all is a lofty, plain, Calvary cross, upon which is a figure of the Saviour.

Plans of the Imperial Opera House, which it is proposed to erect at the corner of the Haymarket and Charles-street, on the site formerly occupied by Her Majesty's Theatre, have been under consideration by the Theatres Committee of the London County Council. The building will have a frontage of 198ft. to the Haymarket, 145ft. to Charles-street, and 198ft. to the Opera-arcade, while seating accommodation will be provided for 2,232 persons. The committee recommend the approval of the plans when altered as desired.

**CHIPS.**

A branch free library was opened on Monday night in Wandsworth Bridge-road, Fulham.

The Swindon District Council have raised the salary of Mr. W. E. Morris, their surveyor, by £26 per annum.

The district council of Hayland adopted plans by Mr. T. W. Cubbon, of Birkenhead, for public offices and a meeting-hall. The estimated cost is £3,500.

A new board school was opened at Friston, East Suffolk, on Friday. It accommodates 100 children, and cost £725. Mr. Edward Rope was the architect, and Mr. Pooley, of Leiston, the builder.

The mining districts of Western Australia are proving a happy hunting ground for typewriter companies. We understand from the Yost Typewriter Co., Ltd., that their late energetic representative, Mr. W. T. Harding, is shortly to open a depot at Perth, with agents at Coolgardie and other mining stations in Western Australia. Mr. Harding, we believe, is doing a large business in the sale of typewriters.

An inquiry was held on Friday at the offices of the Moss Side District Council by Major-General H. D. Crozier, R.E., an inspector of the Local Government Board, with reference to an application by the board for sanction to borrow £2,500 for the erection of a public free library, and £400 for the purchase of stables and for street improvements.

The town council of Leith have decided to erect a suite of public baths in Henderson-street, at a cost of about £12,000. The swimming-tank is to measure 100ft. by 40ft.

The oil painting, "The First Communion," by Miss Flora Reid, has been presented to the Art Gallery of Birmingham.

The Leeds School Board have decided to build a new school for blind and deaf children, at a cost of £18,000, in Blenheim-walk, Blackman-lane. The buildings, which have been designed by Mr. W. S. Braithwaite, of Leeds, will accommodate 108 boarders and 100 day scholars, the cost per child being £87 15s. 2d., exclusive of excavating and heating.

At Kingston-on-Thames, on Monday, Henry Clifford Holden, builder, of 10, Cheapside, and West Hampstead, was remanded, in custody, for obtaining money and goods by false pretences. It was alleged that he traded under the style of the Castle Engineering Company, with offices in Queen Victoria-street, and that no such company existed.

The tender of Messrs. D. J. Ranken, Limited, for erecting the Durham county buildings, has been accepted by the finance committee, the amount being £13,875 10s.

Estimates for the principal schedules of work in connection with the Paisley New Infirmary are at present being considered by the directors. They do not see their way meantime to proceed with the complete scheme, but will provide accommodation for 108 patients (100 ward beds and 8 beds for special cases), the total cost of which, including site, will be £63,457. Of that sum £55,000 has already been subscribed.

In the Queen's Bench Division on Friday, before Mr. Justice Wright and Mr. Justice Kennedy, an appeal by the governing body of Charterhouse School against an assessment of £3,000 on the school for inhabited house duty was allowed, on the ground that, so far as the masters' houses were concerned, the masters themselves should be assessed, and that the other buildings were not inhabited in any sense which would render them liable to assessment.

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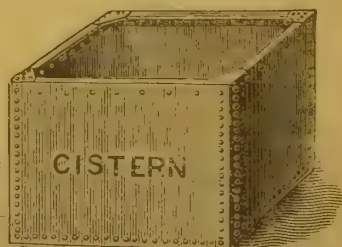
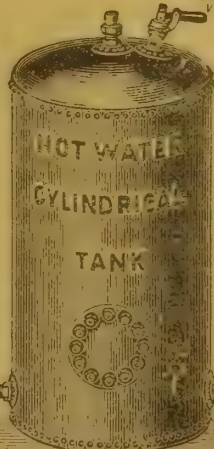
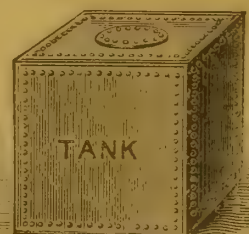
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## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2143.

FRIDAY, JANUARY 31, 1896.

## "FIREPROOF" BUILDINGS.

"FIREPROOF construction," there is reason to believe, originally signified construction which was proof against fire. At present, as we all know, it is a conventional phrase for an expensive mode of building in which iron or steel and concrete are among the chief materials. It is this mode of building, rather than real protection against fire, which boards and committees look for, when, for instance, they insist on fireproof flooring. If they are to be burnt, they wish to be burnt in the manner of the period, with concrete and cement, and rolled or riveted joists about them. There are cheaper ways of fireproofing which, perhaps, were they only in fashion, might save them from being burnt at all. In certain towns of the Midland Counties, the burning down of a house used to be a decided rarity, simply because there were plaster floors instead of boarded ones; because the spaces between the joists were filled in, just above the ceilings, with coarse mortar 3in. or 4in. thick, and because, instead of framed partitions, the rooms on the upper floors, as well as the lower ones, had brick walls to divide them. But this was a shockingly antiquated way of proceeding, and what was worse, nobody could take out a patent for it. Moreover, it was so simple and so obvious, that it did not impress the public. They wanted something more clever, and more advanced. They knew, themselves, that bricks would not burn, nor mortar either, and if that was all their architects could tell them—why, they might as well do without architects.

The demand for novelties created a supply. All sorts of ingenious devices were invented, and clients accepted them with enthusiasm. Cast-iron columns and girders came first. The girders did not always wait for a fire to test them, but sometimes cracked and fell at quiet times for no visible reason. When fires did happen, they broke, as a matter of course, as soon as a little water touched them while they were warm, and equally, of course, they collapsed by bending, if they were left long enough to get red-hot. "Fireproof" buildings became a standing joke, though rather a grim one from the loss of life they led to. Then wrought iron superseded cast metal. It was a more trustworthy substance, and could be relied on up to a certain temperature. When this temperature was exceeded, it gave way, but slowly, gradually, and in a decorous manner. Then, and since then, the fireproofers' main purpose has been so to cover it up, as to keep it below the temperature at which it fails, and the covering material most in favour has hitherto been concrete.

An interesting discussion, mainly on iron and concrete fireproofing, took place at the Society of Architects last week. It was started by Mr. Walter Emden, who has had large experience of it in theatres, and was continued by other members whose remarks were equally suggestive. One curious point, which only has to do with buildings containing large audiences, and which does not affect stores and warehouses, was clearly brought out. It is this: that to make such a place fireproof is not enough. That, even if we could thoroughly accomplish it, would only be half the battle; the other half is to make the public believe it so. Here, if anywhere, is an excuse for keeping up the conventional iron and concrete system. So long as the public fancy it will save them from fire, it does actually save them from panic

and panic, probably, is the more to be dreaded of the two. The idea has got a firm lodgment in the popular mind, that because iron and steel will not burn, therefore, of course, they must be fireproof; and while this idea remains there, it saves men from suicidal terrors to know that the place in which they are is built with iron and steel. Another point is equally important. As Mr. Edgar Farman pointed out, the fireproofing of the auditorium would not be enough, even when supplemented by the absence of panic. When audiences have unhappily suffered from theatre fires, it has generally been before the flames reached the parts in which they were. It was the smoke and flame from the stage, from stage-fittings, scenery, and stage properties, and not from the burning of the building itself, that were fatal to them. Over these architects have very little control. But county councils can, and should, take them in hand. They might all be made far less combustible than they are, though this would need close and unremitting supervision. Mr. Emden pointed out that fireproof paints only delay fire for a little while, and that fireproof solutions soon scale off—that is, as they are at present made. But it certainly is not beyond the power of chemistry to discover the means of making wood, canvas, and the like, if not incombustible, at least unflammable; not by mere surface coatings, which are sure to fail, but by solutions which will penetrate and protect its whole thickness. The man who invents a cheap protection of this sort, which will neither weaken fir timber nor make it less durable, will deserve to be remembered as a benefactor to his country. In town houses the use of such an invention would deserve to be universal, and even in larger buildings it would reduce expense by causing wood to be used for the shorter bearings instead of iron.

Mr. Ellis Marsland mentioned a modern kind of wood-and-concrete fireproof floor which has some affinity with the old-fashioned Midland Counties one. This consists in nailing a fillet on to each side of every joist, and inserting between the joists coke-breeze and cement concrete, 4in. deep, with its lower face flush, or nearly so, with the ceiling. When the concrete sets, the fillets hold it in position, and it is found to be a great protection to the woodwork. Other modes of retaining it might, of course, be devised, and perhaps cheaper ones; but here we come to the question of what is the best protecting material. Silicate wool is tempting; it is light and clean, and does not harbour insects. But, since it is only a sort of glass in fine threads, we can hardly expect it to stand great heat without melting. It is only natural, therefore—as Mr. Gritton pointed out—that under the influence of fire it should soon separate from the metal which it is intended to guard. Furnace slag of a less vitreous nature, used in small fragments instead of fibres, is much better, and it has the merit of not cracking and flying when it gets red hot, as the small pebbles in ballast do. But, at the Society of Architects' meeting, coke-breeze concrete was evidently the favourite. It is light, strong, and easily managed, and it hangs to the objects against which it is applied, far more tenaciously than concrete of some other kinds. But very much depends on the proportions of the coke to the cement. If the latter ingredient is economised, the composition may be a source of danger, instead of a safeguard against it.

A gentleman in one of the northern suburbs of London, not long ago, bought new stoves for his dining and drawing-room, and directed a local builder to set them. All went well on the day when they were first lighted, and at bedtime the fires were put out in due course. In the morning, the housemaid came round, as usual, to clean the grates. Not a spark was visible; but to her amazement and consternation, the mantelpiece,

when she touched it, was hot enough to burn her hand. This was found to be the case in both rooms. A bricklayer was sent for, and two roaring fires were discovered in the hollow spaces behind the ironwork. The setter had filled these, or parts of them, with coke-breeze concrete instead of brickwork, and this having taken fire in the day, had gone on burning away, out of sight. Seeing this is liable to happen, it clearly will not do to specify coke-breeze concrete without also specifying its precise composition, and without seeing that the specification is strictly adhered to. Mr. Emden, who is doubtless quite alive to the importance of these points, is also accustomed to face it with other concrete containing chipped granite and sand. In practice, one finds a certain difficulty in getting one sort of concrete satisfactorily faced, in this way, with another sort. It does not make such sound work as if all the concrete were alike, and were put in at one time, as one mass. The first portion gets partially set before the facing is added, and then, in case of fire, there would seem to be some risk that the latter may peel off just where it is most needed.

Can we think of any other material as light, porous, and adhesive as coke-breeze, which would be quite safe from the risk of taking fire? Powdered pumice-stone might do, but its cost puts it out of the question. There is often something to be learned from failures, and a failure of some thirty years back may, perhaps, suggest a possible success in the future. A farmer who owned land on the Essex marshes was ambitious of becoming a brickmaker. He had plenty of clay, which seemed suitable for the purpose—or, at least, looked suitable to him. He hired an experienced foreman, who, if he foresaw what was coming, knew his own immediate interest better than to predict it, and he set about making stocks. In due time a clamp was built and fired. There was rather more smoke than usual, which, the farmer thought, was better than not having enough, and every day he congratulated himself that his bricks, at any rate, would not be under-burnt. One thing, however, did rather dishearten him: the clamp seemed to be growing smaller and smaller. Not in length or width, perhaps; but certainly in height it was slowly vanishing before his eyes, though how this could happen was more than he could tell. At last the bricks were complete; the smoke ceased, and they were left to cool. The clamp was pulled to pieces, and then it turned out that the lower part of it had made a great hole in the peaty clay on which it stood, so that the whole mass had sunk into the ground several feet. The bricks which had disappeared were brought back to light by digging. But neither they nor those which had remained above ground could be called "stocks." Neither were they "grizzles," nor "place-bricks," nor "shuffs," and in spite of all the smoke, they were not even "clinkers." They were too unlike anything which the English builder is accustomed to use, or the English architect to specify, ever to find a buyer, and they had one peculiarity which struck the farmer as decidedly "uncanny." Like St. Cuthbert's stone coffin, they floated in water, and if the maker could only have found a bidder for them in London he might have tied them into a raft, and have sent them up the river like so much timber. So at least it seemed, though whether they would have got waterlogged and sunk on the way he did not too curiously inquire. The fact is, his clay was intimately mixed up with peat. Of course, this, as well as the breeze, had been removed in the course of burning, and the result was as good an imitation of pumice-stone as need be desired for the purpose of making concrete. It is a question whether such bricks as these, coarsely powdered and mixed with cement, would not have all the good qualities of coke-breeze concrete without its risks. There is



plenty of peaty clay left on the Essex coast. Will another farmer, or another brickmaker, try?

Coke-breeze concrete is so light and strong, that one is always being tempted to use it—perhaps with a core of the stronger sort of expanded metal—in place of wood partitions. At the worst, probably, it would be more fireproof than they are; in any case, it would hardly be less so. Yet, with flames on both sides of it, it would be very severely tried in such a position, and so one doubts whether the advantage would be worth the expense. Suppose, however, that something equally light and strong could be found which would really resist the flames, and which would have cohesion enough to carry its own weight, in short spans, from wall to wall without bearing heavily on the joist or girder, which, as a precaution, would naturally be put below it, it would surely come into general use. It need not be dearer than the present system of quarterings with lath and plaster; and if so, these last might be prohibited in London and other large towns as dangerous. With fireproof partitions instead of flame-carrying ones, and with some such floors as Mr. Ellis Marsland referred to, town houses would at once become comparatively safe. The construction, it is true, would not be absolutely fireproof. No construction is so, or is likely to be so, since, with heat enough, all known substances melt, or burn, or volatilise; but it would be fireproof enough for practical purposes. At the very worst, it would burn slowly. The occupants would have plenty of time to get away; and even when the fire got to its height, it would be far less fierce than such fires are now. There would be no partitions to add their fuel to the flames, or to conduct them, as if by a purposely-prepared scheme, from story to story. For a long time, each story would remain shut in both above and below, and for want of draught, combustion would be comparatively smothered. If the stairs were constructed in the same way as the floors, a large proportion of fires would be confined to the apartment they originated in, and those which went further would lose half their present intensity. Instead of a house on fire, it would, till the roof was finally reached, be simply the furniture and fittings on fire—a much less serious thing.

This, it may be said, is a "counsel of perfection." But it is a perfection which would be quite within reach if we could get some cheap material as light and porous and cohesive as coke-breeze concrete which would really resist the flames. Ballast concrete is neither light enough nor cohesive enough for thin partitions, and its pebbles "fly" when heated. Furnace-slag concrete is free from this fault, but it is not as light, and perhaps not as cohesive as would be desirable. We have suggested a concrete in which the cement would be mixed with coarsely-powdered brick of a specially light and porous kind. Probably no such brick is now being made; but where peaty clay exists there would be no difficulty in manufacturing it, or in burning such a clay into ballast, to be afterwards pounded up small. There is the chance of a fortune in it, and we present the idea, to be experimented with, to enterprising people in Essex or elsewhere who may have peaty-clay lands at their own disposal. Still better materials, at present unthought of, may suggest themselves to inventive minds; but the introduction of some such material seems to be the thing on which further progress in fireproofing just now depends.

of Haussmannism in our towns and streets. We have no more the "delight for the eye in archway or ogive, in lintel and casement, in winding-stair and leaning eave." The modern street with its "cleanly monotony," its blank spaces and even surfaces, where not a seed can cling or a bird build, what does it say to our eyes or heart? He goes on to say that the people suffer unconsciously, as the artist does consciously, by the fatigue, heaviness, and gloom of the modern street. An article last week in another journal takes an opposite view, and shows there are compensations of ugliness, that the "Baal of modern vulgarity" has its good side; although our forefathers enjoyed their picturesque surrounding they had much to contend against which the modern citizen is exempt from.

The modern spoiler of our time is found in that composite individual known as the "builder-decorator-architect." His work is to be seen in the fussy, blatant villadom which is springing up mushroom-like all around us, and destroying every vestige of true country life, as well as honest building for living in. His only idea is to build as a speculation, shops, offices, commercial warehouses, suburban houses, with as much exterior show as possible, with the latest of modern fittings and up-to-date contrivances. In this class of business the genuine architect is not a match with him. We see his work in long streets of East-End warehouses and in high residential "flats" and suburban residences at the West-end, disregarding variety or separate studies, which mean expense; his schemes are extensive, for he has found that the secret of cheap building is repetition, and if the buildings vary in elevation the changes are rung by alternating certain features which can be multiplied indefinitely. Combining in himself contractor, builder, and architect, this impersonation of business and "art" can cover twice as much area at the same cost as his more honest *confrère*. But the "builder-decorator-architect" may be merely the head of a firm of art-tradesmen, his work may be done by others—one may undertake the contractor-builder's part, the other the artistic portion of the work, such as it is. It is a convenient name, representing a modern compact between business and modern Philistinism in art of to-day. No doubt it is an unholy alliance; but, for all that, the British public prefer it to anything more exacting on their taste and pocket. We have often heard of the "builder-architect" alliance in which the design and plans are accompanied with a tender to carry out the work at a given price, saving all further trouble to the building owner. And we have only recently heard of the instances of municipal bodies in the United States accepting the plans for water supplies and sewerage works of contractors who also submit plans free of charge. These offers from single individuals to do the work and undertake the responsibilities of architect and contractor are in keeping with the tendency of the day to supply the public with everything from tea and coffee to the complete furnishing of a building at the lowest remunerative rates on the so-called "co-operative store system." Many people believe in this wholesale system—it saves labour, separate profits, and no end of worry; but are they so sure that what they get is the best? When to the dual arrangement of contractor-architect a third person is thrown in in the shape of the "decorator," the most fastidious can have little cause for grumbling. This triple-union is what is really "catching on," and is ousting the legitimate professor of the art of building from his place. The "all-or-nothing" policy is asserting itself in many directions, but in few things more than in architecture. It is the "all-round" practitioner—or one who will undertake to survey, design, build, and decorate—who seems to be making the most

headway in certain quarters. Let us look a little into the actual work fostered by this alliance. The "composite" member of the profession—if we may so call him—has learned that it is easier to ally himself to the builder on one hand and a decorator on the other than to make himself a master of his business. He can undertake to make the necessary designs with the aid of a draughtsman, who is generally a paid assistant in his office; he can undertake the contract by sub-letting the trades, for that appears to be his real business if he has any, and he can manage to turn out a presentable building on the principle of the man who "builds to sell." His motto is certainly not "Design with beauty, build in truth," it is rather "Make a show, build to sell." Whether the "builder-decorator-architect" is a real development of our modern teaching and demands, or an unreal name to conjure up the *mésalliance* between art and trade, it is as well that we see clearly that this kind of embodiment of the profession is one that the public favour. When we say that the builder and the decorator—two useful and harmless trades when they are employed in their proper relationship, but intensely repugnant to true art instincts when united to captivate the unwary—are the main factors of this alliance, it will be understood what the real character of the work of the composite architect is. A building designed on the scantiest and poorest lines, and then decorated cheaply, represents the result. If we analyse more in detail the kind of work which this pseudo-architect does, we shall be able to gauge more accurately the difference to be found between his and the real architect's work. The "composite" architect accepts without inquiry. He copies or repeats the plan of a building which has been found to answer fairly well its use, whether it be a residence or a shop. Why should he trouble to make a special design? It would never pay. The stereotyped villa or suburban dwelling is repeated for a whole estate with but trifling variations. Like the "slop" tailor, he is too astute to wait and receive instructions from intending tenants or purchasers; his customers must be made to fit the house, not the house the customer. Here, then, we see one main departure from the principle of all honest architecture. So also the shop: it is built to a plan, and if any alterations are required they are done at the risk of the tenant. This wholesale principle of building to a set pattern for the largest number is adopted much to the sacrifice of that diversity and character which distinguish the old cities from the new, and have produced in our modern towns the fatigue and dreariness of miles of our city and West-End streets. Appeals to the popular eye have generally been a favourite trick in the hands of the builder-decorator; the elevation appeals more directly to popular taste than plan, and by making it obtrusive by a superfluity of detail by using a mixture of red brick and some light material like stone he makes another bid. "Make it attractive," says the builder, "at any cost." A few pounds spent in obtaining an elevation from an architect or a draughtsman is all that is needed. Red brick, tuck-pointed, with stone dressings that may be of the thinnest and flimsiest, is a favourite material. At all costs, the front must be attractive; it is the best poster, and beats the most "artistic" placard that the advertising agent can put up. And it hides construction that barely passes the requirements of the law. Having made the shell, the work of the decorator begins. Every plain wall must be covered, and what the design wants in interest of plan or idea, the decorator must conceal. And what may be incidentally remarked at this stage, the work is no longer necessarily confined to the sterner sex. The forthcoming "woman-architect" may pos-

#### THE "BUILDER-DECORATOR-ARCHITECT."

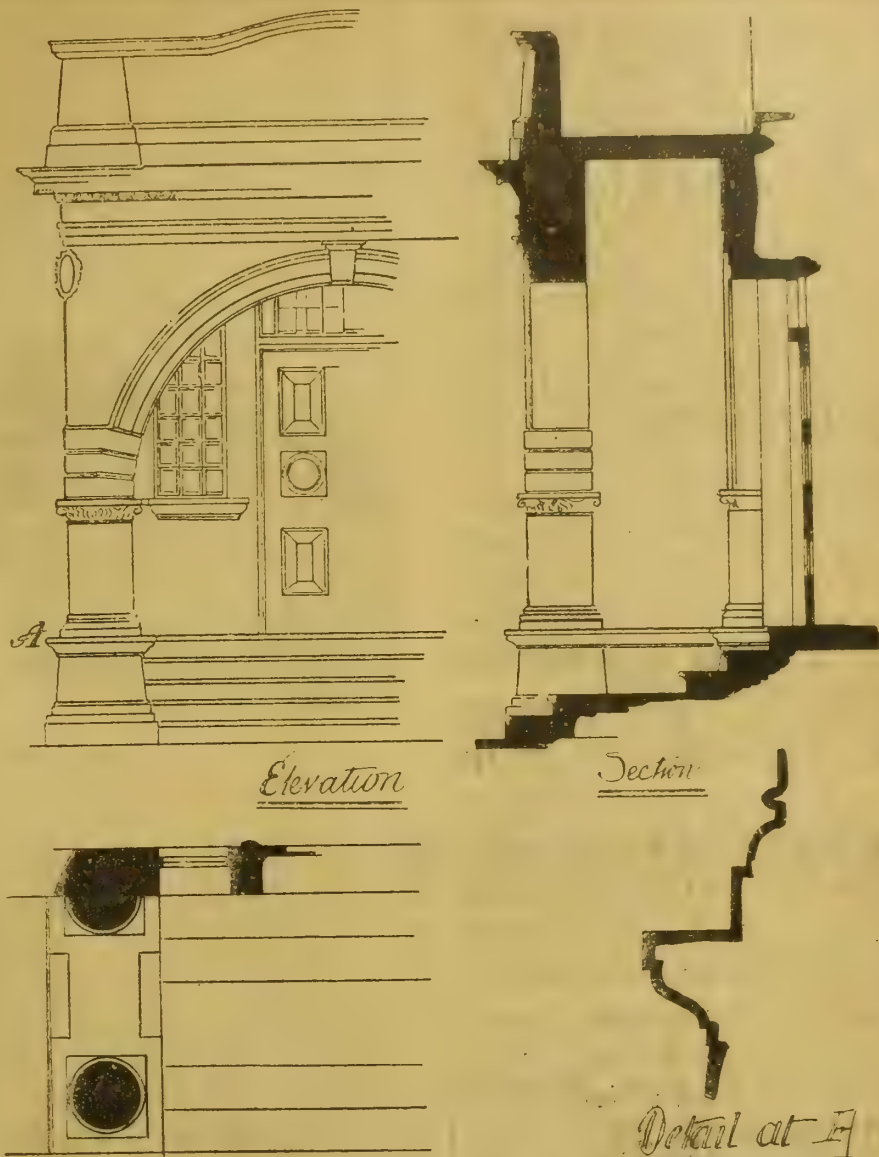
A WRITER in the *Nineteenth Century*, speaking of the deformity of 19th-century life, laments the pitiful destruction of our great gardens, and the development



sibly have an opening in this field; the woman has made a bid for many employments, why not architecture? Indeed, a journal devoted to the fair sex has actually hinted how the "fascinating game of bricks and mortar" can be played by women, and refers to the fact that two architects of repute have taken women pupils into their offices who will perhaps one day pass the examination tests of the R.I.B.A. In the domain of house-building and decoration, under the new architectural régime, the lady architect may do much. She knows more about domestic arrangements than the ordinary speculative builder. The thousand-and-one details which make up a family home are more in a woman's sphere than a man's. If she can do nothing else, she can possibly be taught to arrange a comfortable house, and she can certainly turn her artistic abilities to account. Decoration is a name which covers a great deal of the work of the pseudo-composite architect; it is always the superficial substitute for art. Of course, there is a wide distinction between a decorative artist and a decorator. The first is a man who has studied design, natural and applied ornament and colour and their application to design. He is an artist, or should be, in every true sense; the second is one who carries out the designs of the decorative artist—he is an executive painter who understands the practical methods of painting and colouring. The "builder-decorator" is generally a man who has picked up the practical methods of the latter, and has a capital notion of making such methods of surface adornment as stencilling, gilding, and paper-hanging go a long way. His designs are not always very artistic; seldom the most correct as to style, rarely appropriate in colour. But that matters little. The tenant or the buyer of a suburban residence does not much trouble about the correctness or the real art displayed, so long as it is assertive. In these degenerate days decoration has become more and more mechanical; even the panelled ceilings of our villa residences look thin and superficial, the fittings and furniture of the interiors of our latest block of shops and residences are designed upon the principle of making the most of the material, and of turning out the largest number from the same pattern. According to some, if our picturesqueness and old-world simplicity have had to yield to the demands of science and Philistinism, we have, in return, compensating advantages of life and immunities from disease. But can we take hope or encouragement from this? The time-worn aphorism, "Man cannot live by bread alone," has a certain place in our regards. We do not expect to go back to halcyon days, when "folk moved in picturesque surroundings, wore bright clothes, and danced on village greens"; but we believe still that something can be done to arrest hideousness in every form; that if we cannot have the unspoilt beauty of nature, we can do something towards checking the growth of that monster of blatant commercialism which is spoiling our ancient cities and our fairest landscapes.

#### "ROWTON HOUSE."

FOR the accommodation of the working class in the crowded district of King's Cross-road, and near the terminal stations and goods yards of the Great Northern, Midland, and North-Western Companies, the directors of Rowton House, Ltd., have erected a large and commodious building under the above name, situated at the junction of King's Cross-road and Calthorpe-street. Towards the latter road the building has a frontage of 200ft., and in the former road 125ft. Externally the block, which is of irregular shape, is built of pressed red Leicester facing bricks, relieved by bands and strings of pink Fletton bricks and red terracotta dressings, and the interior is largely lined with cream-colour glazed bricks. The ground floor contains a superintendent's office to



A MODERN ENGLISH PORCH.—(Designed by Mr. C. F. INNOCENT.)

the right of entrance, a large dining-room of L shaped form, and smoking and reading-rooms. The dining-room covers an area of 4,000sq. ft., mainly lighted from Calthorpe-street. It has a dado of cream and chocolate-coloured glazed bricks, plastered above, the dado being built to a chequered pattern. The floors are of oak blocks, set herring-bonewise, and tables and seats are provided for 376 men. Four cooking stoves, with seven hot plates and grills, are disposed round the interior, and a lodgers' scullery is conveniently placed near, and also a crockery and service room.

One feature of importance to notice is the shop, situated between the dining and smoking-rooms, the windows of which open into both rooms; it is lined with glazed tiles, and is fitted up with every necessary convenience, hot plates and boil-itg-water apparatus, with lift to kitchen. The smoking-room facing mainly King's Cross-road is also L-shaped, and occupies the acute angle of building, where a circular bay or alcove is placed. It accommodates 128 lodgers, and is fitted up with chairs and seats of teak. The reading-room occupies the rear side, and is similarly fitted up, the walls hung with engravings, and there are three fireplaces. The basement, faced with cream-tinted glazed brickwork, relieved by jambs and plinths of chocolate and grey tint, has a large lavatory, 56ft. by 36ft., fitted with 80 basins of white enamelled fireclay, with slate slab tops, brass taps for hot and cold water to each, towel- and hat-rails. The floor is laid with falls to an earthenware channel under the basins. A portion screened off from the lavatory for feet-washing room is an excellent provision for lodgers, having a row of troughs 12in. deep, with teak boards between, and hot and cold water-supply. There are also an excellent range of bath and dressing-rooms, having ivory-glazed fireclay baths, with teak tops, and hot and cold supply to each.

Dwarf walls of white glazed bricks separate the rooms. A shoemaker's and barber's shop, lodgers' washhouse, locker-rooms with ranges of lockers on each side of corridors, w.c.'s, urinals, &c., are also provided. The upper floors, six in number, are fitted with cubicles arranged on each side of the centre corridors, and approached by two fireproof staircases lined with glazed brick at each end of the building. The sleeping accommodation thus provided is for 677 men; each bed is in a separate cubicle about 7ft. 6in. by 5ft. each, and is divided from the adjoining ones by wooden partitions about 7ft. 6in. high, so that the cubicles are separated from each other by partitions which do not go up to the ceiling, allowing plenty of ventilation and light; each cubicle has a narrow window, an iron bed on one side, a chair, hat-rail and shelf. The charge for a cubicle, with use of dayrooms, lavatories, &c., is 6d. per night. Mr. Harry B. Measures is the architect of the building, which has been well carried out, without the aid of a contractor, by the company. A building of similar description is to be built at Newington Butts. Externally, the architecture is extremely plain, the fronts slightly broken, and the angle at King's Cross-road emphasised by a turret with conical roof.

#### CLASSIC DETAILS AND THEIR APPLICATION.\*

By G. A. T. MIDDLETON.

XXVI.—MODERN RENAISSANCE: ENGLISH WORK.

IF it be difficult to speak without bias of the work of contemporary foreigners, it is still more difficult to deal with that of one's own living countrymen. General remarks only can be ventured upon, and even these with diffidence.

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Few will deny, of those who are watching the signs of the times at any rate, that the predominant style of the present moment is a Transitional Renaissance. What the transition is to lead to we cannot tell. We are groping in the dark, as all previous transitional workers have done, hoping to develop something good, and meanwhile producing buildings instinct with vigour, picturesque and beautiful, and with features and small details called from all available sources, and often combined in most harmonious manner. It is, too, an architecture of little things. Residences, shops, and the smaller type of public buildings it suits admirably, with its picturesque outlines and fine detail; but the larger works are mainly failures, in so far as they are but magnified examples of smaller edifices, devoid of the expression of grandeur which they ought to bear. In fact, it looks as if the English system of architectural education in dissociated offices, with a one or two days' examination test of powers of design as the ultimate aim of every student, tends as greatly and unfortunately to exclusive littleness as does the academical teaching of the Continent, with equally unfortunate results, to exclusive magnificence. Still, there is more promise of good things to come in the English than in the Continental work, inasmuch as it is much more the natural outcome of the needs of the day. It is, at least, vigorous and energetic, and if it does lack the greater qualification of settled strength, it is only because of its youth as an architectural development.

The illustrations are of necessity taken from buildings which must be well known to all readers, as an unpublished building of any importance is difficult to find; and they may be taken as typical of a whole host of others of lesser magnitude. The Orders are not employed in either the Imperial Institute nor at Scotland-yard; yet they are purely Renaissance buildings, and if inspired by the former work of different countries, both are still instinct with the modern English spirit, while the more reposeful (Scotland Yard), and so the more truly Classic in feeling and effect, is, strangely enough, the more evidently but a pair of villa residences drawn to a larger scale.

For playful, original, and artistic treatment of the Orders and their parts, and of all the other features of Classic work, there has scarcely been any period better than our own. The variety is wonderful, particularly in the smaller gems; and while the porch illustrated is an excellent example of what is being done, it is only one of numberless others which are published week by week in the professional Press. The general tendency is towards broad and low proportions and variety of line, with well-carved ornament sparingly introduced, and it is quite doubtful whether some of the enrichments to be found are not as much of Gothic as of Classic origin.

The reredos in St. Paul's Cathedral is necessarily exceptional, as it had to be designed to harmonise with the existing building; and although the twisted columns provoked much criticism when first erected, there can be little doubt now that they catch and reflect the light satisfactorily, as plain or fluted columns would not have done.

The Institute of Chartered Accountants is also exceptional, for the general tendency of the age is not towards such strength and purity as it exhibits; but it is far too notable a building to pass by. Even the generally admitted defect of the heavy banding of the columns in the lower Order adds to its appearance of strength, while the extreme beauty of its sculptured band is well known, and is a feature only too rarely found. Of cast terracotta ornament and cheap carved brickwork we have ample nowadays, and even low-relief Arabesque carving in stone, with figures and masks introduced, is not rare, and some of it exceedingly beautiful alike in form and execution; but the application of the highest type of sculpture which the land produces to its noblest buildings is rare indeed. It were to be desired that the signs might point more definitely towards the erection of many buildings in the coming time to equal this of the Accountants' Institute in its mastery of all the principles that truly pertain to Classic architecture.



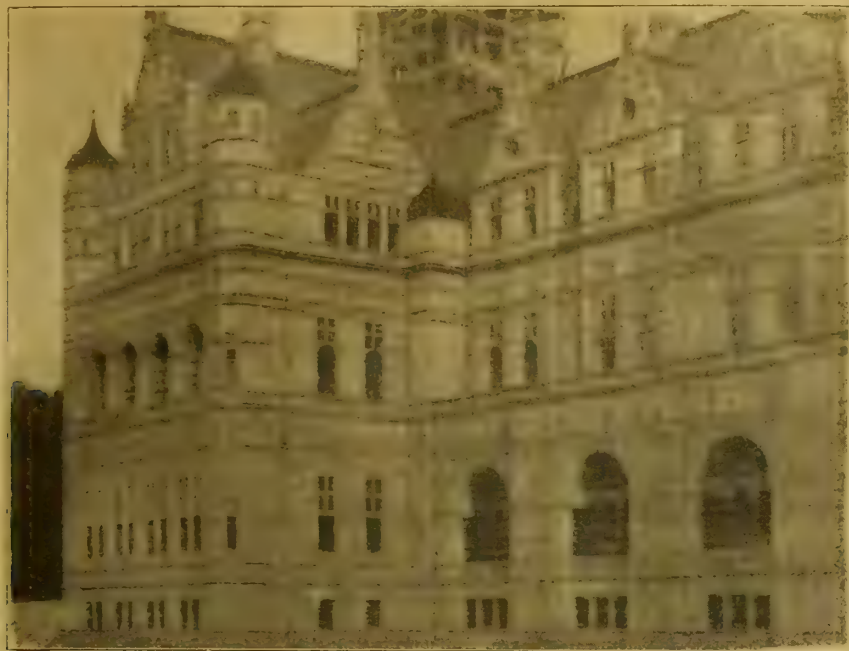
NEW SCOTLAND YARD.



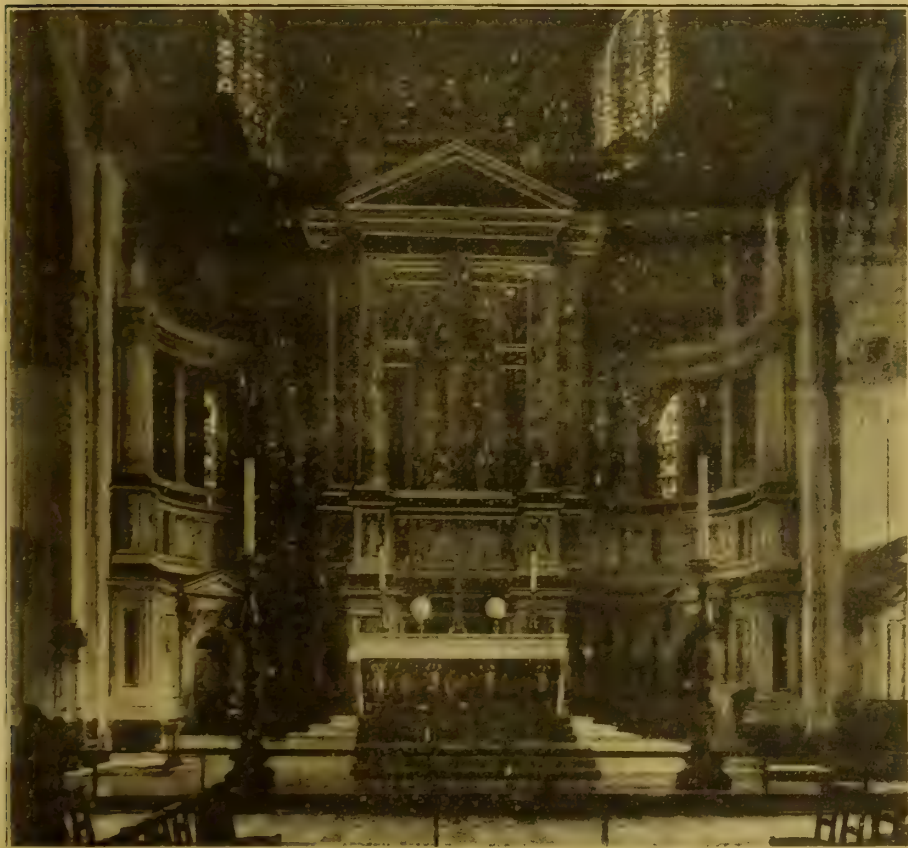
THE INSTITUTE OF CHARTERED ACCOUNTANTS.

Dr. John S. Billings, the well-known writer on ventilation, hygiene, and medical topics, and now Director of the Department of Hygiene in the University of Pennsylvania, has been appointed superintendent-in-Chief of the Consolidated Library of New York, and has accepted the appointment.





THE IMPERIAL INSTITUTE.



THE REREDOS IN ST. PAUL'S CATHEDRAL.

**"BUILDING NEWS" DESIGNING CLUB.****SMALL PUBLIC BATHS.**

THE plans sent in for this subject cannot be considered satisfactory, and possibly it would have been too much to expect that a problem of this character, which, no doubt, is of a special kind, could be handled with knowledge which can come only of experience. Those members of our Club who, at any rate, made an attempt to work out the little scheme for a small public bath cannot have completed their essays without acquiring some advantage, notwithstanding that their productions, for the greater part, display ignorance on many essential requirements. On the other hand, some of the designs are considerably more interesting and admirable than not a few of the wretched blocks of bath

buildings erected by small local bodies, who employ their road and highway surveyors to design and supervise the buildings which are put up with the ratepayers' money. Schemes often devoid of convenience, cramped in idea, and positively hideous in design are foisted upon the public on the penny-wise-and-pound-foolish policy. The surveyor, anxious to keep local architects at as far a distance as possible from the official work of the district, will in some cases undertake to "do" the parish buildings free of extra payment sooner than permit a regular architect to be employed, and then have to farm out the drawings, owing to his own personal inability to make designs. It is not a matter of surprise that the buildings, when built, are nearly always utterly below contempt; they are generally very dear, and by no

means worthy of the occasion. The conditions for our competition were as follows:—B.—A small public bath, adapted also for use as a public hall, with four first-class and six second-class slipper-baths, the bath to be used on alternate days by men and women. The bath hall to have a distinct entrance from the bath proper, with emergency exits for use only when the bath hall is used for public meetings, for which purpose a separate staircase from the gallery will be required. The swimming-pond is to be 80ft. long by 28ft. wide in the clear; w.c.'s, &c., to be provided for each of the sexes. A small office and a pay-office to be provided. The site is in a street with a frontage of 55ft. and a depth of 130ft., having a back right-of-way 10ft. wide leading to the next thoroughfare. The bath proper to be towards the main frontage. Accommodation required for the caretaker's rooms, and a small board-room to be provided. A simple treatment for the façades to be adopted, suitable for brick and stone, and slate roofs. The position of boiler place and fuel store to be clearly shown. Elevation, and two sections, and necessary plans with a perspective view. Scale of elevations and sections  $\frac{1}{4}$  in. to the foot, plans  $\frac{1}{8}$  in. to the foot. Plans of roofs optional. Skylights to be dotted on ground plan.

"The Owl" is the best, and we illustrate his drawing herewith. The second design is by "Thistle," and the third place is awarded to "Country Cousin." We do not say that "Owl's" plan would be a good solution of the problem; but he has merits undoubtedly, and he has endeavoured to adopt externally a more pleasing style of façade. To find fault where so much is wrong is not easy without seeming severe; an attitude which ill becomes an assessor, no matter how firm a conviction he may entertain concerning his own abilities, a remark which is justified by recent experience. The turnstile at the entrance, as here placed, is not of much practical use as a register beyond the gross total of entries, seeing that for each of the three departments a different price is paid. The waiting-room, common to both first and second-class slipper-baths, is an inconvenient arrangement, neither one thing or the other, and in itself the place would be stuffy and dark. The rear compartments also of the slipper-baths themselves would be deficient in light, particularly in the second-class series, where the urinal has no external window. The attendant in either case has no box or location, and only in one department is a towel-place provided, however inadequately. The side corridor serves the hall as a separate entrance; but as an exit it is not improved by the staircase, necessitating the gallery people mixing so inconveniently with those on the ground floor. Indeed, there is no proper exit from the gallery, and no emergency door communicating with the right of way to the rear of the site, as there undoubtedly should be. The double series of w.c.'s for the two sexes is not wanted, as these conveniences are never wanted simultaneously. When the bath is used as a hall these places would be closed to the public. The absence of retiring-rooms is also an oversight; but the author has done well to provide an establishment laundry, though no means of reaching the subway from the forepart of the premises is shown. The width of the gangway along the deep end of the bath is too narrow, and, moreover, the steps are contrived very inconveniently. "Thistle," in some ways, is better than "The Owl," and we commend his ingenuity in more points than one, though economy of cubical contents is not a strong feature. The w.c.'s should have been placed against external walls, and have had windows of their own. The gallery has no direct connection with the street when used for a hall, and as a bath gallery its shape is inadmissible. No subways are shown; but the establishment laundry is well placed, with the boiler-house under. Externally the design is not effective. "Country Cousin's" first-class slipper-baths are not nice, and no waiting-rooms are provided. His w.c.'s are worked in adroitly, and the gallery extends round three sides of the bath, though four sides for a public hall is better. The laundry is too cramped. The elevation would look quaint, but it is not an effective composition. The emergency exit at the rear should have been connected with the ground floor of the hall as well as with the gallery. "Once More" has a still further quaint façade, well adapted to a bath; but the author has not fairly met the real difficulty fully in the face, seeing that he presumes upon having a side frontage, by which means he secures light, and a hall entrance or two not really obtainable. "E." sticks to the



problem, and overcomes it by locating his slipper-baths on the first floor; they are badly lighted, and there is no need for such ample lavatories for both sexes in the basement, with separate stairs and all to match. The elevation is but poor. "Mandalay" wastes space terribly on the boiler-house and laundry, and by bringing his bath right on to the street gives no room for a proper hall entry. The hydraulic floor rising from the sloping floor of the swimming pond to a level position for the ball floor might be managed, but it is not clear quite how the author would accomplish the contrivance effectively. His elevation is an attempt at something removed from the ordinary, though it hardly escapes the commonplace. "Moor" has taken some pains, but he wastes his inclosures, and places his w.c.'s here, there, and everywhere. His staircases ramble about also in a wonderfully odd fashion, while his roofs vary beyond compare without much method. We cannot with advantage particularise the other designs, which rank in the following order of merit:—"B" in a circle, "Tadpole," "Red Lion," "Sanitas," "Canary," "Veller," "La Cigale," "Dessinateur," "Tee Square," "Cygnette," "Puff-Puff," "Caffir," "Dunelm," "Black Beetle," "Ilex," and "Venus."

#### THE ARCHITECTURAL ASSOCIATION.

THE sixth ordinary meeting of the Architectural Association for the present session was held on Friday evening, the chair being occupied by the president, Mr. W. D. Caröe, M.A., F.S.A.

Mr. V. Steadman was elected as a member.

#### COPPER.

A paper on the capabilities of this metal was read by Mr. NELSON DAWSON, who illustrated his address by exhibitions of large bowls, electroliers, hinges, and other specimens of his design and craftsmanship in copper. In his introductory remarks the lecturer referred to the fact that the metal was originally found in (and derived its name from) the Island of Cyprus. Having mildly ridiculed the widespread tradition that at some early period the metal was used for cutting and chiselling stone and other metals, the author laid stress on the point that while heat softens copper, hammering or any equivalent pressure, such as rolling, hardens it; and that no other processes than these are now known or used. It seems strange, he continued, that the Greek metalworker, who used sheet metal largely, and often in cases where hardness was no object, such as plates for covering doors and walls, the metal hammered into shape and pinned on to wood of which he made statues before the art of casting was invented, should not have beaten the sheet out of these lumps of the softer copper instead of the harder bronze. At present, in cases where sheet metal is required to be ornamented with repoussé or beaten work, copper would, if possible, be always employed, and bronze, as the Greeks used it, never; in fact, sheet bronze is not now procurable for some reason. The nearest we have to it in the present day is an alloy that is used by silversmiths, and called gilding metal. The constitution of this alloy varies with each worker; but it is not a true bronze. Where used at all it is only used to beat up and chase a pattern in from which silver would be cast; it is never used for the beauty of itself, as the bronze of old was. Neither this gilding metal, or any other metal, silver or brass, is so pleasant to work in as copper; and that is, perhaps, why it is such a favourite. As specimens of the very high point the Greeks reached with their beaten work in sheet bronze, one has only to recall the mirror-cases ornamented with mythological subjects in relief. The greaves, helmets, and armour generally were treated in the same way, hammered up out of flat sheet bronze; and though everything they touched became, as if by magic, a work of art of importance, the mirror-cases take precedence. The famous shoulder-straps of Siris are worked in this method, and those who do not know them should study them carefully at the British Museum. Where cast-metal was concerned, there is no doubt the ancients soon found out that copper was much inferior to bronze; and when the art of hollow casting was introduced, or discovered about 800 B.C., the Greeks were so pleased at being able to multiply their works of art, that some of their cities were crowded with bronze statues, and the alloy took as much hold of them as brass has of ourselves in these times. It is said that copper cannot be used for casting—either

that it will not pour satisfactorily, or cracks in cooling, gets air-holes in it, or some other reason; but if one orders anything, such as a door-handle, to be cast in copper, the foundry men manage it somehow, after a little protesting, probably by adding so little tin as would make the metal run sweetly into the mould, but not enough to alter the colour. It is not, however, worth much when done, for it is so soft that under the file it seems very like lead; and unless a casting in copper were particularly required for the colour, it would be more satisfactory to have it done in some other metal. The small amount of tin used to make the bronze run would not affect it much, but as more is added and the proportions of tin and copper vary, the alloy hardens up rapidly until the gunmetal stage is reached—which is about 33 per cent. tin to 67 copper—and this, as we know from experience, is a most valuable and useful metal. The colour that the copper and tin alloys take is very interesting, the red of the first named soon disappearing; and in the gunmetal alloy where there is two-thirds copper to one-third tin, there is certainly not two-thirds of the copper-red remaining. When about 40 per cent. of copper remains to 60 per cent. of tin, a lovely lilac colour is produced; and after this, as the tin still further increases, the colour varies but little from the pale silvery quality of the pure tin itself. To artists this range of colour ought to be of considerable value—the mingling of them in one work would be so effective. The only objection would be that, as the colour varies, so their granulation and malleability vary too; and some alloys are so brittle that under the hammer they break into fragments like common cast iron. So that in choosing the colours of alloys it would also be necessary to ascertain their conditions in other respects. But several, at least, would be capable of being used in some other form; and if we single out pure copper, gunmetal, the lilac and tin, we should have four colours to deal with, out of which a charming effect might be made. In talking about metal, its uses and design, the metal-worker, unconsciously perhaps, divides the subject in his own mind into three parts—cast, forged, and sheet. Here are the three different treatments to which nearly every metal can be subjected, and the three processes that the designer can take advantage of in thinking out his design. These practically are also the three different trades into which metal workmen are divided. It is not until we come to look closely into the thing that we see how widely apart these three branches lie. One may not realise at the first glance that under the heading *cast* nearly all statuesque and sculptors' metal-work must be done; and if we do not admit that it "must" be cast, at least we know that it always has been so up to the present, except in very early days. For *wrought* work we may take, as an example, the Eleanor grille in Westminster Abbey, that monument of twelfth-century skill in ironwork. For treatment of metal in *sheet*, we might instance the elaborate figure-compositions of Cellini's time, that have since then been used to cover shields with, or to beat up a dish for an altar, or to put some *repoussé* ornament on a cup or other plane surface. Here, indeed, are three very different crafts so widely apart that we should not wonder that they have become so much split up and separated, or that all metals are not capable of receiving all three treatments satisfactorily. Thus, with copper, we find it is practically useless for casting, while in forged work we can with difficulty recall anything in this metal, so we are left with sheet, and here really lies the strong point of copper. The kindliness of copper under the hammer in practice is a constant surprise. With care, one is able to do almost anything with it—to bump it up into relief, and then, if it is wrong, to hammer it all flat and begin again; to take a flat piece, and hammer it first into a cup shape, afterwards drawing in the top and lengthening it upwards until the original piece of sheet-copper is a vase with oval body and long narrow neck. A metal-spinner of much experience said that in their trade the most difficult thing to do was the ordinary stethoscope that doctors use. But a good coppersmith would not make any difficulty about such a shape if he had a good bit of copper to do it with. Formerly the common jelly-mould was the triumph of the craft; it is easy to understand that to make a shape with many pinnacles and castellations from flat sheet, keeping a fairly even thickness and never tearing open the metal, took some skill (one uses the past tense because, probably, being such a very fine sort of craft, it is by this time obsolete, and put aside in favour

of a mechanical process, such as stamping). Repoussé has come to be the general term for all ornamental work raised on sheet-copper by the hammer. It really hardly matters if, to gain the relief, one beats up the design from the back, or beats back the background in front—pretty much the same end is reached. If you see a new pattern in a silversmith's shop in Regent-street—a brush-back, mirror-case, or whatnot, in relief—that pattern has been bought by the shop from some chaser who has designed it and beaten it up in copper. The business man buys it, has it either cast or, perhaps, a stamp made to turn it out by the hundred, each impression being slightly worked on to give an air of reality, or still more likely nowadays, would have a mould taken from the chaser's copper pattern, and take electros from this. Besides these patterns, silversmiths have some of their large vase and bowl shapes beaten up in copper and finished with all the ornament complete and then silvered. When the old Georgian tea-urns passed away with our grandparents, a great and interesting phase of the copperworker's craft went. There was a considerable variety of design in them, and, being used by the richer sort of folk the standard of design was kept up, and in all of them there was a refinement which, if not of the highest sort, shows an interest on the part of those who produced them. We do not think much of a globe shape in metal to-day when spinning can quickly give us almost any shape we require, but in the days when such a form was raised by laborious hand-work only, it demanded admiration and respect. The only equivalent we have to these old urns to-day, are the brewers' utensils, which seem to have altered but little in style or form for a long period. There are one or two firms who still make these old-fashioned measures, and for those who love good craftsmanship, these things are quite fascinating. It is a fearful sort of joy, however, for one always fancies that the work is too honest and straightforward for these days, and that the ancient shapes and methods must soon give way to some cheaper and quicker process, and this good craft be left behind in the ghostly past with such old friends as the pattern-makers, the horners, and others. Indeed, the hand-made sets are even now going out of use, and are being replaced by forms of an easier shape to stamp by machinery. In beating up small ornamental work in copper, especially when it is as small as silversmiths require, it is put down on a cement made of pitch and other ingredients. This is melted every time the copper is put down, and, besides holding the metal tightly, offers a slightly yielding material against which to hammer. If, when the copper is on the pitch, we take a punch and make a straight line—indented of course—that line will come out on the face of the metal as a clean sharp line. If, however, we do not put the copper on to any cement at all, but make the indented line on it, as it lies on the wooden bench, it produces a very different effect on the face side. Now the line shows indefinitely, and, instead of the metal being raised just where it was struck, the surrounding part is dragged up too. If an effect were desired between these two extremes, one should place the copper on a half-way material, such as stiff clay or modelling wax. The result of the beating would also be half-way—neither too precise a line nor too blurred. These three courses give a considerable range, especially where the metal-worker has some artistic capabilities; but the usual way, which is generally the worse way, is to first trace on the face side of the copper the whole design, with what is practically an incised line, and then slightly bump it up here and there from the back. This is the cheapest and readiest way of getting an effect. But to get the best quality out of copper or any other metal with the repoussé treatment, let the face-side have the least possible amount of work—none at all, if it can be helped. The point is an all-important one architecturally, for this reason: That where ornamental copper would be used in a building as a decorative panel—a tablet with lettering or otherwise—it should "carry," as the sculptor says—that is, the design should look clearer at a distance off than it does close to. A design which is clearly and sharply cut and looks very well close to will not show to advantage at a distance, will not "carry," in other words, while a design that looks somewhat blurred and indistinct close to becomes quite sharp and clear ten yards off—it "carries" exceedingly well. This is one very good reason for putting all the work possible on the back of the metal, leaving it somewhat



blurred in front, and not "finishing" it, as they say, by chasing and putting a clean hard line around everything. One objection that is made regarding copper, when used for decoration in a house, is that it requires cleaning, or it loses its chief beauty. Well, there is some truth in this, but it is not altogether correct. In the first place, if it be required to keep its own colour, it can be lacquered; and this, if judiciously done, will last a very long time, and is both easy and cheap to renew when necessary. But copper that is not lacquered—simply left and dusted in the ordinary way by the housemaid when the rest of the house is dusted—will take a most delightful colour in time. When the word "bronze" is used most of us think of a dark, almost black, material, while its real colour is a pale gold, paler than the copper that so largely composes it. If, then, we are content to let bronze assume a patina—nay, hasten it chemically—let us be content to let copper do so too, and we shall get a colour that is as rich as chemically-coloured bronzes. One of the most beautifully coloured pieces of copper I have ever seen, and no Japanese work ever approached its patina, was a large brewer's copper vessel, that between constant rubbing with a cloth and fresh spillings of liquid, had assumed a wonderful olive-green patina, hopeless to reach artificially. If, then, you have a copper in a house, and are not minded to have it cleaned or lacquered, let it be dusted with a soft cloth and it will require no more. Yet another means of preserving copper, and by the way that the Japanese use. The most familiar example is the so-called liver colour that was produced on our old-fashioned tea-urns—a dark-brown chocolate colour that took a high polish. This is produced artificially and with little difficulty by means of chemicals of different mixtures, called "pickle" in the workshop. Different pickles give different colours, from a pale saffron gold, a whole range of brown, occasionally a rare olive green, to Indian red, but never in England reaching the beautiful lobster red that the Japs have found out. There is a whole range of colours that, once produced on the copper, are not only themselves permanent, but act as a varnish in preventing an action of the atmosphere. The importance of this fact showed out recently in the case of a memorial-tablet in a church which was desired to be of copper, the objection being that when the immediate friends had passed away, it would become uncared for and soon reach the dingy stage, a condition that the more familiar marble never reaches. It seemed difficult to find a metal that would do any better than copper, which was wanted, but with the aid of such an artificially-produced patina, the difficulty is removed, and there is no reason why copper should not be used. For any other case where an inscription or lettering in any form is wanted, it may be said that no other metal opens out such chances as copper, especially if treated in an artistic manner, provided, of course, the design and execution is not left to the tender mercies of the usual commercial person. One can only refer to the lamentable state that mural brasses have reached in our time, and suggest that the artistically-treated copper offers an escape from such terrors, especially if the tablet be within reach of an occasional duster, giving the slight amount of polish that makes the use of lacquer or other preservatives unnecessary. One other treatment of copper must be noticed before finishing, and as artists we shall feel it to be treading on unholy ground—electrotyping. A clever mechanic will turn out in electro a copy of a repoussé dish that an expert could not tell from the original, unless he looked at the back. This is a thing to be thankful for, this tell-tale back of the electrotype, otherwise there would be no distinguishing it, so faithfully does it reproduce every mark, every touch of the hammer or chisel. One may say, if an electrotype has exactly the appearance of the correct thing, it must be as good. Most plausible, but most weak! The fact that you can mechanically reproduce a good thing a hundred times, makes it a hundred times worse. A good piece of copper or any other metal work, on which an artist has spent time and care, will always be valuable; and equally the most exact reproduction of it, especially by any mechanical means, will always be valueless. This form of copper-work is the only one that may be called unlawful, and if we do not leave it altogether alone, it should only be used for the commonest purposes. We have now considered some of the good points and some of the bad points of copper, and the question naturally arises, To what use can this

metal be put with advantage to-day? Well, externally, and excepting in the case of roofing, copper is not much used. There has been a mild desire to cover the door of a church or mansion with it occasionally—in the case of the former with repoussé work, which is capable of having a very rich effect. Sometimes one sees the name of a tradesman in high-relief letters in copper or a name-plate by a door, in both of which positions they seem to get well rubbed, and invariably catch the eye as we pass. In one or two cases sheet copper has been largely used, in conjunction with wood-work, in the decoration of big West-end public-houses; and although here it looks *appliqué* and cheap, that is not the fault of the copper. It is very difficult, but most important, so to use sheet copper, or any other metal, that it does not look thin and papyry, and as if cut out with scissors. Of course, sheet-metal, unless of some thickness, is frequently cut into shape with shears; but if this is apparent when the work is finished, the effect is disastrous. All the durable and hard qualities of the metal seem to disappear, and the thin, fragile, undurable character asserts itself unpleasantly. For a glaring instance of this misuse of the material, though in iron, we have only to turn to the sheet-metal portions of the much-vaunted iron railing from Hampton Court Palace, in the South Kensington Museum, reputedly by Huntingdon Shaw. One would not be understood to mean that sheet-metal must be made to look like cast, or any other form of metal, only equally it must not be made to look like paper. If any metal-work looks thin and poor, not solid, strong, and metallic, then the designer is no artist, and the workman no craftsman: both have wasted their time and chance. Beyond these one or two things, then, one does not see copper used externally—though, at least, wherever sheet brass is used, there also certainly sheet copper may be used. Indoors, it is different, especially in domestic work. For a good, comfortable, home-like, and cheerful appearance in drawing-room, dining-room, or kitchen, copper cannot be beaten. Near a fireplace, and kept bright, it has a cheery glow that rivals the fire itself; the mere fact alone of its being kept so bright is a constant and recurring announcement of housewifely attainments. A polished copper hood to your drawing-room fireplace, even though the chimney does not smoke, will be an evidence of taste and sensibility that even a Tottenham Court-road suite of furniture would hardly dim, while anything like copper panels let into one's own mantelpiece would be a joy for ever. There is hardly any interior metal-work that, if one desired, might not be done in copper, saving, perhaps, poker and tongs; and even the former of these he once saw made out of a huge copper bolt of some old Navy ship. Hinges, too, one would not use it for, as it would wear too quickly; but we can use the gunmetal alloy where the actual wear and tear comes, and rely on our old friend for the ornamental part. For finger-plates, a set of door furniture in bright copper will do more to redeem a drawing-room from depression than the most gorgeous wallpaper, and the sparkle of electric lights in copper reflectors and copper stands will be only second to gold itself. Be sure there is a future yet for sheet metal work, and that largely in copper, in this country. The Dutch have had their turn, and it lasted several centuries. For ourselves, we seem so far to have inclined more to the cast or forged work. But, personally, he would not hurry the time of popularity for copper by a moment; rather, it should be deferred, lest that mammon of unrighteousness, "the trade," lays its cold and grasping hand thereon the sooner, thereby making it the hateful thing that brass has become. Let us talk about it quietly among ourselves, spend time lovingly on the working of it, and possess our souls in peace.

In proposing a vote of thanks to the lecturer, Mr. F. T. W. GOLDSMITH referred to a Saturday afternoon visit paid by the members to Mr. Dawson's workshop, when they saw not only sheet-metal work, but beautiful enamels enriched with copper. For hammered work few materials were so suitable as copper, and for electroliers it afforded the opportunity of providing the cylindrical masses and broad effects that were needed. For memorials the metal was well adapted, and he recalled a church restored by their president, in which was an angel with outstretched wings, executed in copper from their president's designs with excellent effect.

Mr. W. CARPENTER seconded the motion, observing that he had found that some of the sheet-

metal leaves on Huntingdon Shaw's gates from Hampton Court, now exhibited at South Kensington, were actually of copper instead of iron, like the rest of the old work; these were probably restorations. Brewers' vessels were often of great size; he had seen them having a base 15ft. across, and varying in thickness from  $\frac{1}{2}$ in. to  $\frac{3}{4}$ in., and yet all beaten from a single sheet of metal. The modern patinas on copper were without body, and of a painfully uniform colour.

Mr. T. STIRLING LEE remarked that wrought copper was only second to gold in colour and artistic value. Unfortunately, it quickly showed signs of wear, and hence from early times a bronze alloy was used for all purposes where endurance was a first requisite. Owing to its rich colour, copper needed to be sparingly used in a scheme of internal decoration. When beaten out from the back, it carried farthest, and for a tablet or lettering, a light and shade treatment was the most appropriate. Its great defect was the scizzors edge of the cut sheet; this should always be hammered out till it loses its paper-like outline. Nothing gave a more beautiful effect to copper than polishing it by the human hand, and the next best was cotton waste. There should be a bossiness about the treatment of repoussé; this alone brought out the full quality and value of the metal, and engraving was a sheer waste of labour.

Mr. F. W. POMEROY contrasted the Greek work in bronze at the British Museum with that illustrated in a modern trade catalogue, ejaculating, amid hearty laughter "There's a picture for you!" He pleaded for a larger use of decorative metal-work in our homes, and said electrotyping had its uses in enabling us to reproduce and compare in one place the best works in metal.

Mr. OWEN FLEMING said he did not recollect any demonstration of working in copper having been given at the A.A. Studio in Great Marlborough-street. The use of copper was greatly neglected in the training of the young architect; but in London this metal, when employed out of doors, soon lost its characteristic patina, and, like bronze, grew almost black.

The PRESIDENT, in closing the discussion, observed that one of the most cheering signs of the times was that artists were gradually drawing nearer together. Many of them knew Mr. Nelson Dawson, not only as a skilful craftsman, but as a refined landscape painter. He disagreed with the lecturer's admiration of lacquered copper, for as the lacquer faded, horrible brassy effects were produced in the copper, which, when left alone, toned down in a pleasing manner. The metal specially lent itself to simplicity of ornament—he could only hope that the trade would deal gently with it should it come into vogue, and aim at only broad and simple effects. As a roofing material it speedily turned black in any smoky town. Some years since, having admired its effect in Dublin, he obtained and had analysed samples of the material used for the Four Courts' roofs and other public buildings in that city, and was surprised to find that where the material had stood best, the analyst reported it to be the most impure in quality. The unplesing knife-like edge of sheet copper should always be hammered out, and rounded off before it was used.

Mr. DAWSON briefly replied.

#### PUBLIC BATHS COMPETITION, KINGSTON-ON-THAMES.

THE competition plans for this corporation work at Kingston-on-Thames have this week been on view in the borough offices, Clattern House, and the committee have adopted the award made by the referee, Mr. H. Hessel Tiltman, F.R.I.B.A., whose report was presented at the last meeting of the town council. The site of the new buildings is situate in Wood-street, not far from the market-place and centre of Kingston. Six firms of architects were invited to compete, and seven schemes were submitted by the following gentlemen: Messrs. Ruck and Smith, Maidstone; Major Henry Macaulay, the borough engineer, Kingston; Mr. W. Hanstock, Batley; Mr. Guest Luckett, Aylesbury; Messrs. F. J. Smith and Maurice B. Adams, and Messrs. Spalding and Cross. The design by Messrs. Smith and Adams has been chosen. The problem consisted of one large swimming-bath, to be used alternately by both sexes, and capable of being used as a public hall, and, besides this, six first-class and ten second-class men's slipper-baths were to be provided, with further accommodation for women's slipper-baths. A distinct entrance for the use of the public baths, quite apart from that



intended for the public hall, was stipulated as essential, and emergency exits from the gallery were to be contrived leading directly into Wood-street, as well as towards the public thoroughfare of Thames-street to the rear of the premises, where a right of way is secured. An establishment laundry, though not mentioned in the conditions, necessarily occupies an important part of the scheme. The frontage towards Wood-street is about 64ft. wide, with a depth of about 150ft. The swimming-pond is 90ft. by 30ft. The leading characteristic of the selected plan is its extreme simplicity with ample entrances and exits for all purposes. The elevation is in red brick with stone dressings, treated after the Renaissance, with a clock turret to mark the public hall entrance, while a shaped gable emphasises the centre of the façade, which is quiet and unassumingly picturesque. The referee sums up his critical remarks on this plan by stating that "the elevations are pleasing, and, generally, the design has been carefully and satisfactorily worked out."

"The arrangement of the basement is altogether the least wasteful of any of the plans submitted, and the engineering scheme appears to have been well conceived." "The arrangement of the establishment laundry, in its relation to the establishment, is very good indeed." Certain modifications are proposed, and will be carried out to meet what the assessor describes as "certainly difficult and conflicting conditions," and he adds, this design "has the fewest defects, and with the least alteration could be made suitable for the purposes" contemplated. He gives the cubical capacity at 254,451c.ft. at 7½d. (the price he adopts throughout) = £7,446. The other designs, which in the exhibition rooms are arranged in the following order, may be briefly referred to:—

No. 1 has, in general terms, a somewhat similar arrangement of the fore-part of the plan with separate entrances. No waiting-rooms are provided, and the basement is "wasteful in the extreme." The façade is commonplace rather, with patterned gables. The dressing boxes are not sufficient, only 37 being contrived. The cost, on the before-named basis, is stated at £8,962. No. 2 is presumably by Major Macaulay, and the referee describes it as illustrated by "a very carefully worked-out set of drawings, and shows much study of local conditions." "As the engineering part of the scheme has been well considered, it is to be regretted that the general planning falls so short of an equal standard." The elevation is not very architectural, and the cost is figured at £8,500. No. 3, by Messrs Ruck and Smith, is an eminently practical design, with a cubic capacity of 288,628c.ft. at 7½d. = £9,015, and the exterior treatment much resembles the Maidstone swimming-bath, by the same firm. No waiting-rooms are provided, though the slipper-baths are well arranged. The report of the assessor urges that the public hall "is not adaptable for use for entertainments." No. 4 comprises two designs, both of which are worked out very carefully with excellent drawings giving many details at large. We understand Messrs. Spalding and Cross are the authors. The large bath is roofed at a much lower section than most of the other plans, and the dressing-boxes with sliding fronts are located under a low roof, which Mr. Tiltman objects to, "as the condensation of any moisture in the bath under them would be found very disagreeable." He takes exception to the want of separation between the bath and hall entrances. The gallery is at one end of the hall only. The laundry is in front, in the basement, and an internal area to get light much hampers the general arrangement, which seems too broken, though the crush hall is needlessly roomy and ample where space is so limited. The façades are handled with taste, but appear lacking in repose. The cost is priced at £7,087. No. 5 plan does not occupy the whole area of the site, leaving wasteful areas on either side approached by narrow ways to the hall from the street. The building is treated architecturally more like a board school, and has a turret in the centre, the whole being proposed in yellow brick, with red brick dressings. The roof over the big bath is exceedingly simple. The drawings are most elaborately worked out with details of almost every part. "The main part of the disposition of this plan is good," but all the doorways, passages, and staircases are too narrow, the halls being wanting in light. The lengthy report and specification accompanying the exhaustive drawings show that very great care has been exercised by the author. The slipper-baths are mistaken in their subdivision and faulty in arrangement. The price is stated at £8,257.

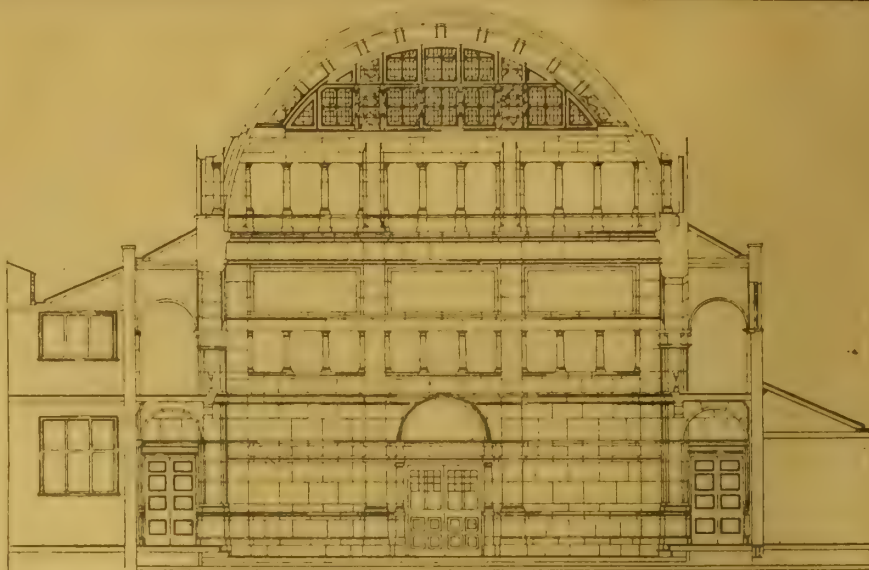


FIG. 4.—Detail End View.

### CONCERT HALLS AND ASSEMBLY ROOMS.—XI.

By ERNEST A. E. WOODROW, A.R.I.B.A.

OF the concert halls and assembly rooms attached to a public restaurant, there is nowhere in London a more perfect example than the King's Hall of the Holborn Restaurant. Mr. T. E. Colcutt, with his characteristic good-nature, has lent me his drawings from which to make my illustrations; and Mr. Hamp, the well-known manager of this vast establishment, has given me every information.

either side. A particular feature is the range of three private boxes at one end overlooking the hall; these were specially devised for the convenience of ladies, friends, and distinguished guests who might wish to witness the proceedings, listen to the music, and hear the speeches, or perhaps see their husbands dine. At the end opposite these private boxes is placed the minstrel gallery, which will hold some 60 or 70 musicians.

Perhaps the next use in importance to which the King's Hall is put is for dancing, and for this purpose the floor has been specially prepared. It has been described as "a polished floor laid down on a very ingenious principle, whereby the planks are perceptibly elastic to the



FIG. 1.—Ground Plan.

A, entrance-lobby; B, crush-room, with exits; C, grand staircase; D, ladies; E, hats and coats; F, gentlemen; G, private dressing-room; H, council chamber; I, service; J, service lifts; K, extra staircase; L, service staircases; M, staff entrance; N, connection with restaurant.

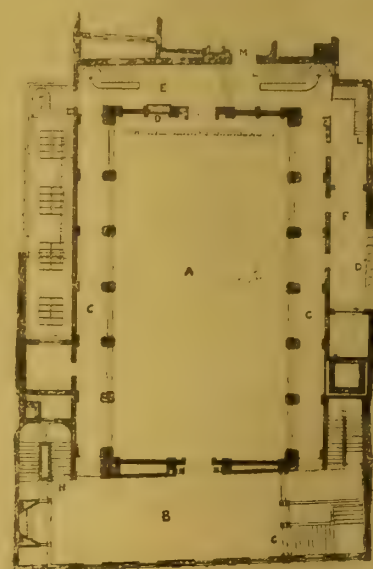


FIG. 2.—First-floor Plan.

A, King's Hall; B, crush-room; C, raised promenade; D, lifts; E, lobby; F, service-room; G, grand staircase; H, extra staircase; L, service staircases; M, connection with restaurant.

I would draw attention to one important fact which emphasises the great skill of the architect in obtaining such good results: that this is, after all, but an addition to an old building, and therefore the free hand in planning a new building was, to a great extent, restrained, as due account of its use in connection with the existing parts of the premises had to be taken.

Naturally, in speaking of a restaurant, one looks upon the assembly hall attached thereto first as a large banqueting hall, and as such we must first consider the King's Hall. The seating accommodation at a banquet in this hall is for 500, and there is room for another hundred guests in the balconies, which run the full length of

foot, combining buoyancy and noiselessness." For soirées or entertainments, where the crowds are constantly on the move, the building has the advantages of large and beautiful crush-rooms, wide staircases, overlooking balconies, and space under the balconies for seats out of the way of the dancers or promenaders.

Mr. Hamp, as a public caterer, knows the need of ample cloakroom space. It is, therefore, on the ground plan that one finds the large room for hats and coats in addition and separate from the big areas given up to ladies' and gentlemen's retiring-rooms. Provision is even made in connection with the latter for a dressing-room in which the busy man arriving late may change into his evening dress at the last moment.



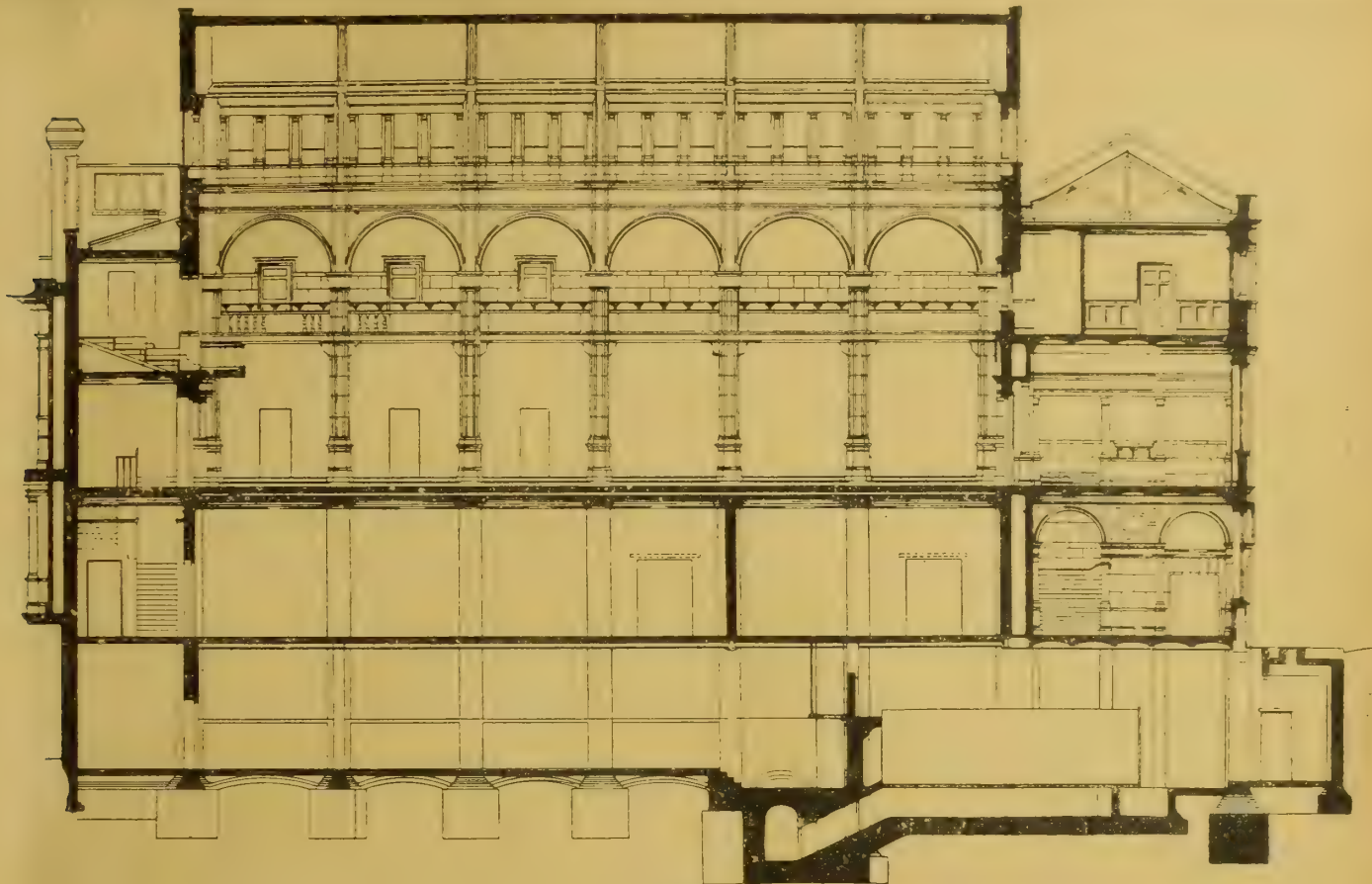


Fig. 5.—Longitudinal Section.

The hall is adapted to public meetings and concerts by being seated with chairs battened together in lengths, and by placing a movable platform at the end under the minstrel gallery, its acoustic properties are excellent alike for music or speaking.

The entrance hall is so arranged that guests

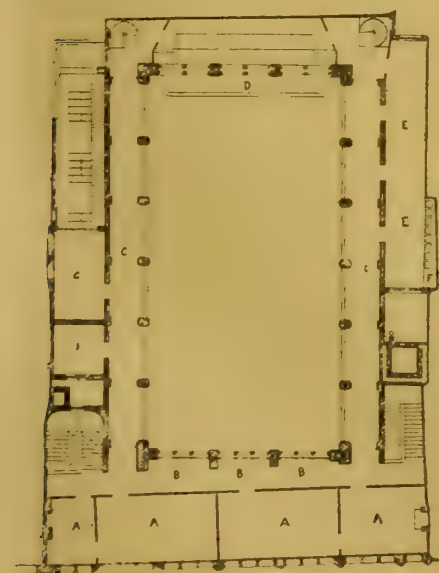


Fig. 3.—Second-floor Plan.

A, dining-rooms; B, private boxes; C, galleries; D, minstrel gallery; E, service-room; F, lifts; G, I, other service-rooms.

arriving can enter at the lobby on the north end, and pass into the crush-room through a pair of swing doors, which exclude the draughts and night air; but for departure there are doors leading directly from the crush-room into the street, so that several carriages can "take up" at one time, expediting the departure of the guests, and avoiding that nuisance of waiting in draughty passages.

Over the crush-room, and approached by the grand staircase, is another crush-room of equal

size, which leads to the King's Hall, and on the floor above are four private dining or drawing-rooms of varied sizes.

Under the King's Hall is the Council Chamber, a room that can be used for many purposes either in connection with the King's Hall or separately. It is suitable as a supper-room when a ball is given, a refreshment-room and promenade when a soirée takes place, a lounge or assembly-room for a banquet, or as a separate room of public entertainment, for concerts, lectures, private theatricals, &c., when the King's Hall is too large for the requirements of the entertainer.

The safety of the public—a consideration first and foremost in my mind—is not overlooked in this building. Ample and wide staircases and exits are provided at both ends of the buildings at all levels.

The basement is occupied by "service" and one of the finest "private" electric light chambers in London. The "service" in connection with the King's Hall is most perfect—that is to say, the system adopted has worked without a hitch. On every level there is an oblong service-room, with several ordinary "dinner" lifts against the wall, as shown on the plans. From these service-rooms and lifts the waiters obtain their "dishes," and can simultaneously serve 500 guests in the banquetting-hall. It is this "service" which is the connecting link between the restaurant and the assembly room.

#### THE TIMBERS OF AUSTRALASIA.

ONLY within the last few years have the superlative qualities of the timbers of Australasia—specially the hardwoods—begun to be recognised and appreciated, excepting by a few experts, even in the countries of their growth. This is sufficiently attested by the novelty to most of the respective audiences of much of the information contained in the papers on "Some Ornamental New South Wales Timbers," and "Some of the Pale Hardwoods of New South Wales," read before the Sydney Architectural Association, by Mr. J. H. Maiden, F.L.S., Curator of the Sydney Technological Museum and Consulting Botanist to the Forest Department of New South Wales, and now superintendent of the Technical Education Branch of the Public Instruction Department, on August 3, 1891, and September 5, 1892, and also on "Australian

Timbers, with Special Reference to the Ornamental and Decorative Woods of Australia," by Mr. G. S. Perrin, F.L.S., Conservator of State Forests, Victoria, before the Royal Victorian Institute of Architects, on September 5, 1893. So important was this latter contribution to the timber literature of the South Seas considered, that it was reprinted in pamphlet form, for general circulation, from the professional journal in which it first appeared, by order of the Government of Victoria; while, the very next month, the Government of New South Wales, having in view the complete success of the latest wood-paving operations in Sydney, requested Mr. R. W. Richards, A.M.I.C.E., the city surveyor, to prepare a special paper on "Wood Pavements in Sydney," for gratuitous distribution. But while a theoretical knowledge of the Austral timbers has been disseminated by the above and other papers, a constantly extending practical acquaintance with them has been gained by more impressive and convincing means. The splendid display of her timbers made by New South Wales at the Chicago Exhibition in 1893 came as a revelation of the mother colony's wealth in wood to the experts from all countries who attended the World's Fair (just as her display at the Melbourne Exhibition of 1888 had done in a more limited way), and roused the envy of her sisters, who had carried Sir George R. Dibbs's famous expletive of "Damn Chicago!" into literal effect, and were unrepresented at Lake Michigan. Since then the Governments of the unrepresented colonies have been making strenuous efforts to push their timbers in the American, British, and Continental markets, while the unexceptionable character of the most recently laid wood pavements in Sydney has attracted the marked attention of every observant visitor to the "City of the Beautiful Harbour."

On the occasion of the Melbourne International Exhibition of 1888, as also at the Jubilee Exhibition at Adelaide the preceding year, the timber exhibits of New South Wales were accompanied by a report detailing the results of the experimental tests for the strength, &c., of the various timbers, the making of which extended over a period of fifteen months at the hands of Professor W. H. Warren, M.I.C.E. (Challis Professor of Civil and Mechanical Engineering at the University of Sydney), and assistants, in the professor's laboratory at that institution, by means of an autographic stress-strain apparatus, specially designed and prepared there for the



purpose. The report contains twelve pages of closely-printed tables, and fifteen sheets of diagrams, and was printed in the form in which it was before me at the time of writing, by the Government Printer of New South Wales, at the request of the Royal Commissioners of the New South Wales Court of the Adelaide and Melbourne Exhibitions. The figures given in the report have been regarded in Australia as authoritative since the time of their publication. The only danger of inaccuracy would seem to lie in the fact that, although the samples of timbers for the tests were furnished by the Mines Department (now the Mines, Agriculture, and Forest Department) of the colony, the various species of Eucalyptus were less precisely differentiated eight or nine years ago than they are now; and, likewise, that some portion at least of the confusion which prevails even yet respecting some of the gums is almost certainly due to the existence of cross, or hybrid, species or varieties, caused through the fecundation of one species by another, in the thickly-growing forests. In 1892 a fresh report, by the same professor, with more exhaustive, but less readily usable tables, and forty-four plates of diagrams, entitled "Australian Timbers," was published by authority of the New South Wales Commissioners for the World's Columbian Exposition at Chicago. The most important results of the above tests will be given in a later article, and those who may have occasion for more detailed information will, doubtless, be enabled to refer to the reports themselves on application to the Agent-General of New South Wales in London.

In 1893 the timber trade of Victoria received a special impetus through the establishment of the Australian Seasoned Timber Company, which was formed to take over the patent rights of a Swiss gentleman named Rieser, whom Mr. Perrin met at Maria Island, in Tasmania, in 1887, while he (Mr. Perrin) was engaged in investigating the timber resources of the Island Colony for her Government. So favourably was he impressed with the process which Mr. Rieser then explained to him for the artificial and quick seasoning of timbers, that carefully watching, as he did, the progress made during the next five years, there was little difficulty in eventually forming the company in question, with mills at Wandong, in Victoria, on the North-Eastern Railway of that colony, and, as the result of these operations, Mr. Rieser went home to London in the latter part of 1893, armed with numerous samples of timber seasoned by his process.

But the most patent factor in extending a knowledge of Australian timber generally, and of those of New South Wales in particular, has been the visit paid in 1894 to the United Kingdom and the Continent of Europe by Mr. Gavin Scott, of Sydney, the head of the firm of Scott, Sibbald, and Co., agents for builders' materials. Mr. Scott is a native of Dumfriesshire, and carried with him to the Antipodes, less than a dozen years ago, the shrewd long-headedness for which his countrymen are noted. Recognising, as his local knowledge extended, the stupendous wealth of timber existing in New South Wales,\* as well as the unapproachable quality of her hard woods. Noting that that colony was being cut out in the timber markets of the world by her less richly-endowed sisters, through the aid of their respective Governments; and finding that little assistance in developing the trade was to be obtained from Sir George Dibbs's Ministry, which was then in power—the representation at Chicago was arranged during the administration of Sir Henry Parkes—he determined to take the whole matter into his own hands, and start for Europe, which he accordingly did, with 30,000ft. of sample timbers, figuratively speaking, in his portmanteau. On his arrival in England, his Scotch stolidity stood him in good stead, and rendered him armour-proof against the attempted snubbing and cold-shouldering of the conservative Briton. It was no use turning a deaf ear to Mr. Scott's representations: he had determined to be heard, and he was heard. During the six months that he spent in the Northern Hemisphere he interviewed something like a thousand repre-

sentative men, including the surveyors of nearly all the leading towns and vestries in the kingdom. At first he experienced the greatest opposition to the introduction of his colony's timbers, the export of which at the time of his visit was practically nil; but so successfully did he trumpet forth their value, that since his return in March a million and a quarter superficial feet had been shipped home from Sydney, and a like quantity was on order on October 19, on which date the *Harvest Queen* sailed for London (where she would be due about New Year's Day) with the largest shipment of hard wood and other Australian timbers ever sent to England. Indeed, that was the first occasion in the history of the colony, upon which a ship had been chartered to land a full cargo of timber only (amounting to about 1,400 tons of most carefully selected stuff) for any foreign port. In like manner, the *Stratheathro* was already chartered to load in November and December, and the *Lurline* for December and January, while the *Karoo* (the sister ship to the *Harvest Queen*) was carrying to Liverpool, for the Mersey Harbour Board, a trial shipment of turpentine piles and girders 24in. by 24in. and 40ft. long. The particular qualities and characteristics of this timber will be explained hereafter; for the present it is sufficient to mention the saving in cost alone, apart from the superior efficiency of the wood for its special purpose. The Mersey Board have been paying, as I understand, 5s. per cubic foot for American greenheart, which they usually employ for subaqueous construction, whereas New South Wales turpentine-tree can be delivered, carriage paid, to British ports for about 3s. In the same way, it was shown the Midland Railway Company that several of the South Wales hardwoods, especially blue gum,\* spotted gum,† tallow-wood, and blackbutt, while more durable and serviceable than the usually employed oak, are fully 30 per cent. cheaper. As a result, extensive orders for the timbers have been placed in Sydney, not only by the Midland, but by the Great Northern, the Great Western, the Great Eastern, the London and North-Western, and other British railway companies, while the city of Paris has ordered a consignment of iron bark, tallow-wood, mahogany, blackbutt, and blue gum, with which to institute independent experiments in the matter of wood-paving.

By no means the least important achievement in connection with the Australasian timber trade has been the recent floating of the Australasian Timber Company, Limited, in which 40,000 shares were taken up by timber consumers in England, and the remaining 10,000 by the sawmillers of New South Wales. The results attendant on the formation of this company are already very large. Yards occupying several acres have been secured at one of the many favourable spots in Sydney Harbour—viz., at Darling Island, where the loading of the *Harvest Queen* (already spoken of) took place. But there is also another—a better-known and an older-established company—the Federal Timber Company, which, with a head office close to the Sydney General Post Office, holds the annual contracts for supplying the Government of New South Wales with the different kinds of hardwood required by the various public departments, and likewise supplies the Sydney Corporation with a large portion of the tallow-wood and blackbutt employed for wood-paving. The wharf and yards are situated at another of the numerous indentations of Port Jackson—viz., Rozelle Bay, near Glebe Island—with a frontage alongside which five vessels can unload at one time the timber sent from the various stations on the coast nearest to the felling districts; while the company have in contemplation the construction of several vessels of particular dimensions for this branch of the trade alone. In these yards the giant logs are not only "broken down" (trimmed, or cut into planks) by the huge

steam saws: but are both stacked and dried, the latter process being effected in a spacious drying-kiln, operated on a new principle, and capable of dealing with 10,000ft. of timber at a time. The wood is so stacked in the kiln that there is a free play of air over the whole surface; then the sap "is sweated out" by the action of steam, on much the same principle of the Russian vapour bath, and finally a constant current of dry air, heated to 140° Fahr., is forced through the chamber for several days. The complete success of this mode of artificial seasoning has been sufficiently demonstrated in the case of the tallow-wood parquet floors laid throughout the Sydney office building of the Equitable Life Assurance Society of the United States (described in the BUILDING NEWS of July 19, p. 67), the whole of which were thus seasoned and prepared in the company's yards in 1891, and do not show a sign of shrinking, warping, or any other defect. The company's largest mills are at Cooperbrook, on the Manning River (about 236 miles north of Sydney), from which a private tram-line, three miles in length, runs to the heart of the primeval forest. Important, however, as this company is, the timber trade, even of New South Wales, is far from being dependent on it. Considering the enormous areas covered by timber of a quality altogether unapproachable, the value is almost incalculable, while the supply may be regarded as practically inexhaustible. One mill alone might be mentioned which owns the right to fell over 100,000 acres of land, with an average of 12,000ft. super. of timber to every acre, and this simple statement might find many others to bear it company.

From the foregoing general and prefatory remarks it will be seen that the timber trade of Australasia (and especially of New South Wales) is a thing which is already making giant strides, and the ultimate dimensions of which it is impossible even to guess at. That the departure, however, is no mere freak of fashion, nor speculative craze, but the natural development of national enterprise in the utilisation of a vast natural asset, to meet the wants of other lands, I shall endeavour to show in the succeeding articles.

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(To be continued.)

## DESIGNING OF STEEL BRIDGES, THEORETICAL AND PRACTICAL. —XXVI.

IT has already been amply demonstrated in previous articles how members or parts of a truss, which are theoretically redundant, can be at once detected by the application of our general equation—

$$S = (2 \times A - 3).$$

Whether such members are equally practically redundant cannot be determined until not only the general design, but some portion of its details have passed from the mind of the designer to the surface of the "double-elephant or antiquarian." As the necessary drawings, together with the accompanying calculations, progress *pari passu*, the former lend or, as it were, shape themselves to the requirements of the latter, until ultimately all the separate components are blended and formed into one harmonious whole. After obtaining and plotting to a fairly large scale a longitudinal and cross-section of the site of the bridge and its approaches, the next point to ascertain is if the "levels" will permit of a "through" or a "deck" bridge. In the example we shall now select and work out in detail, it will be assumed that the difference of the level of the approaches, and that of the headway necessary to be allowed, will admit of the use of a through bridge. For an explanation of these terms, the student and designer is referred to the first part of these articles dealing with steel-plate bridges. The particular type or form of the main girders is the next, and a very important question to be considered and decided. In the present instance we shall select a design which has been largely employed in America, where the engineers are

\* It may be interesting to explain here the precise way in which these floors are laid. The tallow-wood, finished to a thickness of 3in., was cut into 2ft. lengths, 3in. wide, each piece being grooved and dressed. The timber was laid in squares, chevron fashion, on a concrete floor, floated with hot bitumen 3in. thick. When each two pieces came together, the V-joints formed a dove-tail, which enabled the bitumen to curl up and secure them together firmly. The system dispenses with the ordinary plan of nailing each board, and produces a perfect floor at a cost, in Sydney (where the price of bitumen is £20 per ton), of 12s. per square yard, exclusive of the concrete.

\* According to official statistics, the area of woodland in New South Wales—that is to say, the unalienated Crown lands bearing timber trees of commercial value—is 21,000,000 acres; and it was stated by the Hon. Alex. Kethel, M.L.C. (the "Member for Timbers," as I may venture to call him, on the lately-appointed Board of Export Trade), in a paper on "The Commercial Timbers of New South Wales," read by him in November last before the Sydney Chamber of Manufacturers, that a single acre is capable of growing timber (such as cedar, for instance), to the nett value of £90.

\* As many of the Australian timbers are known in the vernacular by their colour, it should at once be stated that these colour names (as indeed the common names generally) have been given by the timber-getters or sawmillers in the forest itself (or "bush," as it is called in Australia), and have usually, though not always, reference to the hue, not of the wood, but of either the bark or the foliage of the tree. For instance, both the blue gum and the grey ironbark are timbers of a rusty-red appearance, but derive their common titles from the colour, the one of the leaves, which when young are not green at all—on the palette French grey with a dash of indigo—the other of the bark, which is between a silvery and an iron grey.

\* At the International Exhibition held in London in 1862, a piece of this timber from the hull of the steamer *William VII.* was exhibited. With the exception of some slight charring of the timber in the immediate vicinity of the boilers, the entire fabric of the vessel was as substantial and sound as when she was built in the year 1830.



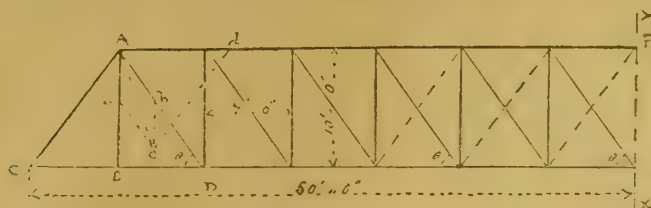


Fig. 1.

*facile princeps* in nearly every known form of bridge girder and truss. Besides, this particular form is coming very much into use among European engineers, and has been erected in more than one instance by the Engineer-in-Chief of the Great Eastern Railway under the metropolitan roads crossed by the extension of the line into the terminus at Liverpool-street.

In Fig. 1 is represented a skeleton elevation of one-half of the type of truss we have chosen. It is simply an N truss, with a span of 100ft., a depth of the ratio  $\frac{S}{D} = 10$ ft., a panel length—that is, the length of each bay or distance between the consecutive materials—of 7ft., and the other dimensions may be calculated as follows. Thus if L be the length of the verticals, P that of a panel, we have—

$$\tan. \theta = \frac{L}{P} \text{ and } \theta = 55^\circ.$$

Also if  $L_1$  be the length of the diagonal bars, then—

$$L_1 = L \times \text{cosec. } \theta = 12' 3''.$$

One of the advantages of this form of girder is that by making the verticals to act as bars under a compressive stress, their length becomes greatly reduced from what it would be were they and the diagonal bars (which are ties) caused to change places. It cannot be too carefully borne in mind that in all girders and trusses the struts are invariably the weakest members, and a very liberal margin of strength must be left to them. Independently, moreover, of the absolute amount of net sectional area imparted to them, there is another more serious consideration yet, and one which was but very little understood in the early days of iron construction. It is the ratio of the total length of the strut to its cross-section, which virtually puts a limit to its lineal dimensions. It may be remarked that in all the iron bridges and girders which have failed either through purpose or accident, as it is called, the cause of the incipient deformation, and sometimes distortion, was clearly traceable to the want of proper proportion, and consequently of proper bending resistance in the compressive members.

It should be mentioned, before proceeding further with the design, that the bar AB in Fig. 1 will not be a strut, similarly to the other verticals in the half truss. The stresses upon it, moreover, will not be affected by those upon the other members. Its sole duty is to transfer the portion of the dead-and-live load distributed over the last panel C and D of the half truss to the apex A, where it will be resolved into its components in the directions of the upper flange AF, and the terminal sloping strut AC. As this strut has also to take its share of the stress of half or, since, as it will be shown subsequently that the web is double, of one quarter of the total load upon one main girder, it will be found to be very heavily strained. A reference to Fig. 1 will point out that at the apex A of the truss four bars meet. Those who have perused our former articles on the present subject, in which the method of "moments," of "sections," and the principle of "funicular polygons," and "polygons of forces" have all been successively treated of, might suppose that this apex forms an example in which the second method fails. But this is not the case, for the stresses are known, not on one, but on two, of the bars—viz., AB and AD. The resultant of the stresses upon these bars, resolved in the directions AC and AF, finally disposes of them. The diagram in dotted lines in Fig. 1 shows the method of ascertaining the final stresses upon the terminal strut and the upper flange of the truss. These are represented respectively by the dotted lines cd and Ad.

The design now assumes the form of a railway bridge to carry a double line of way of the type of truss in Fig. 1. In this example concentrated loads will be disregarded, and their equivalents in the name of uniformly distributed loads sub-

stituted. It is very doubtful whether, with the long, heavy stiff rails now in use, the cross sleepers placed so closely together, or, better still, the continuous timber or steel stringer, there can be any of the effects produced, attributed to the theoretically distributed load, where none of these efficacious media of distribution are supposed to be available. There is no question but that a uniformly distributed load, equivalent to the total of the supposed concentrated wheel loads of the engine, would afford resulting stresses much closer to those actually occurring in practice. In estimating, therefore, the total loads, dead and alive, upon the whole bridge, we proceed as follows:—There are numerous equations and formulæ for arriving at the approximate weight of the main girders of a railway bridge; but they all require certain data, which will now be investigated. The equivalent uniformly distributed load may be put for the double line per foot run at 2.75 tons. Calling the total live load by the symbol L, we shall have—

$$L = 2.75 \times 100 = 275 \text{ tons.}$$

The dead load will consist of the weight of the main girders, cross-girders, platform, sleepers, stringers or longitudinal beams, and the rails, chairs, and fixings. Until the central cross-section of the main girders is determined, their

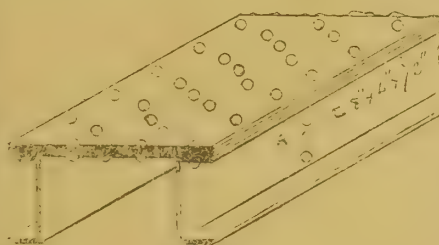


Fig. 2.

weight cannot be approximately ascertained by the formula usually employed, so that a shorter rule may be used which will make the weight of one of the main girders equal to 28 tons.

It will be seen from Fig. 1 that there will be thirteen cross-girders in all, one at each panel-point, placed at the intersection of the vertical struts with the lower flange. Each cross-girder 25ft. in span will weigh about 3.25 tons, so the total weight will be equal to 42 tons. The platform may be constructed of steel arched plates, or of the trough-shaped section, or of a patent corrugated shape. Whichever may be ultimately adopted, the weight, as the load to be carried is the same for all, will not vary to any sensible degree. If they be taken, on an average, as equal to 16.5lb. per square foot, which will give a total for the whole length of the bridge of 18 tons, the weight of the rails, sleepers, whether transverse or longitudinal, and the other items constituting the permanent way, may be put at 815lb. for each lineal foot of the double track, which will amount to 37 tons. We have now only to consider the weight of the stringers or longitudinal, which may be considered equal to 110lb. per foot run, or a total of 20 tons. We may now sum up the total load, live and dead, to be provided for, and it will be prudent to annex an additional 10 tons for bracing to resist wind-pressure, and impart lateral rigidity to the whole structure.

Equivalent uniformly distributed load	275 tons.
Two main girders	56 "
13 cross-girders	42 "
Steel platform	18 "
Permanent way (double track)	37 "
Longitudinals or stringers	20 "
Allowance for wind bracing	10 "

Total 453 tons.

Halving this total for one main girder, we have

the total load to be carried by it equal to 230 tons in round numbers.

Before deciding upon the precise form or section of flange to adopt, it will be advisable to first determine the quantity of metal required at the most heavily stressed part of it—that is, at the centre of the girder. We shall not recapitulate the value of the symbols formerly employed in these articles or any general items of information with which our readers are already acquainted. Employing the equation for the stress upon the central part of the flange—

$$S = \frac{W \times L}{S \times D}$$

and substituting the proper values in the present instance, we obtain—

$$S = \frac{230 \times 100}{8 \times 10} = 287.5 \text{ tons.}$$

Putting A for the net sectional area or net quantity of metal required in the flanges at this point, and assuming the unit stress or number of tons that may be safely put upon one square inch at 6.5, we obtain—

$$A = \frac{287.5}{6.5} = 44.23 \text{ sq.in.}$$

The form of the section of the flange has next to be designed, and one will be selected with the especial object of diminishing the amount of riveting usually employed, reducing the number of joints to a minimum, and giving to each member that amount of weight and *dis inertia* which alone enables it to resist deformation and ultimate distortion. Light bridges, built up of light component parts, suited light engines and light trains, which at the small velocities adopted in the early days of railways, possessed but small impactive force. In the present days of comparatively enormous engine weights and high velocities, it is not sufficient for any one member of a truss to be able to resist solely the calculated stress upon it, even with a fairly large margin. It must be so proportioned as to weight and mass as to adequately withstand the violent shocks of impact to which it is constantly exposed. It is not easy to recognise the tremendous discrepancy which exists between the weight of the early and the present locomotives. One example will suffice, which, although particular, is applicable to nearly all railways. The first engine, the Grasshopper, on the Baltimore and Ohio line, in 1835 weighed 10.7 tons. The present locomotives weigh 80.4 tons. This comparison carries us back to the times when the superintendent of the permanent way on the Great Eastern Railway complained bitterly of the difficulty he had to keep the permanent way in good order, owing to the great weight of the locomotive, which was 12.25 tons!

In Fig. 2 is shown an isometric view of part of the upper flange at and near the centre of the span. The net sectional area of metal required is 44sq.in., which is built up of three steel plates 24in.  $\times$   $\frac{1}{2}$ in., and two channel irons 8in.  $\times$  4in.  $\times$   $\frac{1}{2}$ in. This is the gross sectional area; but in this area in each plate a deduction must be made for four rivets  $\frac{1}{2}$ in. in diameter, and for two rivets of the same diameter in each vertical channel-iron. So if S be the net sectional area or value of the three plates, the calculation is—

$$S = 3(24\text{in.} - 4 \times \frac{1}{2}\text{in.}) \frac{1}{2}\text{in.},$$

from which—

$$S = 10\frac{1}{2}\text{in.} \times 3 = 31.5\text{sq.in.}$$

Putting  $S_1$  for the effective area of the two channel-irons, a similar calculation will give—

$$S_1 = 2[(8\text{in.} + (2 \times \frac{1}{2}\text{in.}) - \frac{1}{2}\text{in.}) \frac{1}{2}\text{in.}].$$

Multiplying and reducing, we obtain—

$$S_1 = 13.5\text{sq.in.}$$

Adding the values of the two equations, we have  $S + S_1 = 45\text{sq.in.}$ , or a trifle beyond the amount of material actually required. Referring to Fig. 2, it will be seen that while the upper horizontal flanges of the vertical channel-irons are riveted to the horizontal flange-plates, the lower are not connected to each other by any transverse attachment. They are, as will be demonstrated by subsequent detail drawings, connected to each other by the vertical struts and diagonal ties shown in Fig. 1. Independently of this method of connection, which occurs at every panel length—that is, at distances 8ft. apart—the flange in Fig. 2 is stiffened laterally every 4ft.—that is, at every half panel length—by a diaphragm shown in Fig. 3. The diaphragm is composed of a vertical plate  $\frac{1}{2}$ in. in thickness, riveted to each vertical channel-iron by an angle-iron 3in. by 3in. by  $\frac{1}{2}$ in. An elevation of this flange tracing is



shown in Fig. 2 at A. The only difference in the flange throughout the length of the whole truss will consist in dropping one or more of the plates towards the points of support, which will be effected by rules already enunciated. If, instead of vertical channel-irons for the sides of the trough flange, vertical plates and angle-irons to

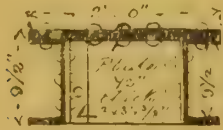


FIG. 3.

connect them with the horizontal plates are used, considerably more riveting is necessary, and more building up as well. The number of channel-irons can obviously be increased if the width of the flange should require it; but they cannot be placed too closely together.

#### NOTES FROM PARIS

A RATHER interesting and novel idea formed the subject of a conference made recently at the Ecole des Beaux Arts by M. Geron, architect. The idea, proposed as a clou for the 1900 Exposition, is the construction of a sphere having an interior diameter of 165ft., representing the celestial vault containing the principal known stars and planets. In the centre of this sphere, a second hollow sphere, 40ft. in diameter, will be arranged for receiving visitors, who may examine the artificial sky through openings made in the shell, and a platform constructed on the exterior at the pole of the smaller globe will afford a like view. Mathematically-calculated rotations of both spheres will complete the illusion; in the supports of the large sphere, rooms containing stereoscopic panoramas and dioramas will be arranged. A feature interesting to builders is the construction of the spheres and the supports entirely of iron wire and cement, a system of construction which is becoming largely employed in France for building purposes, and of which the well-known architect, M. De Baudot, is a fervent advocate both in theory and in practice.

The magnificent and extensive buildings of the New Sorbonne are nearing completion; the Faculté des Sciences on the Rues Cujas and Saint Jacques is finished, and was lately inaugurated by the Minister of Public Instruction. The portion on the Rue des Ecoles, comprising the large amphitheatre, the academy, and offices, was completed and inaugurated some time ago by the late President Carnot. The remaining portion now under construction is the celebrated building comprising the Ecole des Chartes, the five amphitheatres for the Faculté des Lettres, the university library, with storing-room for half a million volumes, the school for higher studies, together with the offices and dependences. The remaining vestiges of the old Sorbonne will soon disappear, to give place to a large reception-hall, forming an ante-chamber to the chief amphitheatre, and to a large number of smaller conference and examination rooms. The architect, M. Nenot, whose designs were chosen in competition in 1882, will probably be able to fulfil his promise to hand over the buildings in a state of completeness by the year 1900.

The Society of Civil Engineers of France is following the lead of its English sister society by building for itself a new house, much more spacious and convenient than the building now occupied by the society. A large area of ground has been purchased in the Rue Blanche, and the construction of the new premises will be commenced as soon as the danger from frost is over. M. Fernand Delmas, the architect of the proposed building, made a recent visit to London to examine the building now nearing completion in Great George-street, which Mr. Charles Barry is preparing for the English Institution of Civil Engineers. The building at Paris will be chiefly constructed of iron as far as the skeleton and floors are concerned; the façade, principally of stone, will contain a touch of originality and modernism, to be given by a large use of metal, a chief feature being a large central bay of stone-work filled in with iron, the effect of which will be heightened by a judicious use of bronze, mosaic, and terracotta or faience. The large hall, capable of containing from 600 to 700 persons,

will be on the ground floor to the rear of the principal building. The work of construction, if found interesting, will be followed up in future notes.

Now that the completion for the long-talked-of reconstruction of the Cour des Comptes has been decided, and a suitable design chosen, it seems rather late to rescind the decision which was made after twenty-five years of hesitation as to whether the building should be rebuilt or not. But it appears that, despite the recent competition and the selection of a design, it is now proposed to utilise a portion only of the ground now occupied by the ruins, and sell the remaining portion in order to provide the funds necessary for the building of a new palace. The result is rather unsatisfactory, and it is now to be seen how the selected architect will receive this decision.

The new Greek church of the Rue Bizet was inaugurated and consecrated last week. This church, the gift of M. Demetrius Schilizzi, whose death unfortunately occurred before the completion of the work, has cost nearly £150,000, and was built from the designs of M. Vaudremer, architect, the style being inspired from that of the first Byzantine sanctuaries. The decoration is simple and sober, but a general effect of richness is given by a large quantity of costly marble panels, and effective mural paintings by Lumeire.

The painter, Hippolyte Berteaux, has just completed the decorative panels now adjoining the dome of the principal staircase of the Senate at the Luxembourg. The subject treated by the artist is somewhat complicated: Humanity, under the influence of Law, is gravitating towards Justice and Liberty, and under the reign of Peace, Eloquence descends to Wisdom and Impartiality. M. Berteaux has reduced this complicated programme to its simplest expression: Humanity is represented by the firm and vigorous figure of a man surrounded by the wonderfully graceful forms of the goddesses. The group is suspended in the limpid atmosphere of a sky crimsoned by the setting sun. The composition is simple; but the *ensemble* is most effective, majestic, and perfectly comprehensive.

The *verrière ouvrière*, or the new glassworks, which the socialistically-minded workmen of the Carmaux glassworks have decided to construct for themselves, is now being commenced at Albi. The novelty in the idea is that the workmen, not content with forming a manufactory for themselves where there will be no master, have the intention of constructing the building as far as is possible with their own hands, and have this week given up their work of glassmaking for a time to busily employ themselves as labourers for digging the foundations of their building.

The question of providing proper sanitation for the town of Toulon is now under discussion. The scheme has to pass one or two formalities before its final acceptance, a chief condition being that the Howatson system should be employed for purifying the waste water coming from the drainage before its being allowed to enter the sea. It is hoped that the scheme will be more successful than that lately completed at Marseilles, where want of forethought in providing a sufficient supply of water for the proper flushing of the drains and sewers brought for a time much discredit on the *tout à l'égout* system.

M. Charles Garnier, the eminent architect of the Paris Opera House, born at Paris on November 6th, 1825, and having, therefore, now attained his 70th year, is obliged to resign his functions of vice-president and chief inspector of the Council of Civic Buildings, the rules limiting the age of officers at 70 years. This administrative function, the highest which can possibly be obtained by an architect, was held since 1846 by the predecessors of M. Garnier—Caristie, Duban, Lefuel, and Questel in their order, and each of these illustrious architects had attained or passed the limit of age and died in the continuance of their functions. It was therefore hoped that once again the rule would be waived, and the eminent designer of the opera allowed to continue his office in peace. But the "Honorariat," an honour which compels the superannuation without the advantages of a retiring pension, would not this time spare M. Garnier, allowing, however, the "Maitre" the right of continuing the supervision of the various work to be done in the buildings due to his talent, and notably at the Opera House, his *chef d'œuvre*. This retirement has much affected the whole corporation of Parisian architects, and many letters of sympathy have been sent to M. Garnier at his villa of Bordighera. It is

hoped that the Government will request his services for a portion of the 1900 Exposition, or for the finding of an idea as happy as that which produced the most interesting series of buildings entitled the "Habitation humaine," the so successful work of M. Garnier at the Exposition of 1889.

Amongst the various nominations of the 1st of January are:—M. Charles Garnier, member of the Institute, appointed Grand Officer of the Legion of Honour; M. Daumet, member of the Institute, is appointed honorary chief architect for the Department of the Seine; M. Heuzé, member of the Academy of Inscriptions, is appointed Commander of the Legion of Honour; and M. Homolle, member of the same academy, together with M. Coquet, architect, are appointed Officer and Chevalier of the Legion of Honour respectively.

The town council has voted a certain sum, and made a call on the honour of various public offices to provide a further sum, destined for the proper maintenance and preservation of a certain number of tombs in the public cemeteries which present an historical, artistic, or national interest. These various tombs, which up to now have been quite abandoned to the ravages of time, contain the remains of a large number of once well-known public men. Those which are more known to the public are the last resting-places of Molière, La Fontaine, the painter Greuze and the musicians Gretry and Méhul, of Heloise and Abelard, the poet Béranger and his Lisette.

#### BOILER TELL-TALE.

THIS invention is the result of the disastrous kitchen-boiler explosions which occurred last winter. The following observations must be noted and strictly enforced:—In fixing, fix the



appliance in top of bath-boiler, in portion underlying back of hot plate, so that it stands in a vertical position, and easily accessible. It must be quite separate from the flow and return or any other pipes. In use, before lighting the fire, test the state of the pipes by turning on the "Tell-Tale" tap, and should there exist a stoppage in the pipes or boiler through frost or any other cause, the water will not flow from tap, and fire must not be lighted. The patentees are Messrs. Young and Marten, Caledonian Works, Stratford, E.

Another victory for the free library movement has been won in East London, Mile-End having decided by a majority of 399 to adopt the Act.

On Saturday evening a tablet in memory of the late Rev. A. Falconer, M.A., who for thirty-six years ministered in the parish of Denny, N.B., was unveiled in the vestibule of that church. It is of Sicilian marble, with medallion of pure white marble, and in size 6ft. by 4ft. It is the work of Messrs. Galbraith and Winton, Glasgow.

At a vestry meeting held at St. John's, Cardiff, a report from Mr. C. B. Fowler, F.R.I.B.A., on the dangerous state of the tower of the parish church was read; his plans for its restoration, at an estimated cost of £3,000, were approved, and the vicar was asked to apply for a faculty without delay. At the same meeting it was decided to sell to the corporation for £700 a portion of the churchyard for the widening of Watling-street, and Mr. Fowler's design for a new wrought-iron railing and dwarf wall to surround the churchyard was adopted.



## CONTENTS.

"Fireproof" Buildings .....	155
The "Builder-Decorator-Architect" .....	156
"Rowton House" .....	157
Classic Details and their Application .....	157
BUILDING NEWS Designing Club .....	159
The Architectural Association .....	160
Public Baths Competition, Kingston-on-Thames .....	161
Concert Halls and Assembly Rooms.—XII. ....	162
The Timbers of Australasia .....	163
Designing of Steel Bridges, Theoretical and Practical. ....	164
—XXVI. ....	164
Notes from Paris .....	166
Boiler Tell-Tale .....	166
The BUILDING NEWS Directory .....	166
Our Illustrations .....	167
Architectural and Archaeological Societies .....	167
Building Intelligence .....	166
Additions to the National Gallery Collection .....	167
Books Received .....	167
Obituary .....	167
Engineering Notes .....	168
Competitions .....	168
Correspondence .....	168
Intercommunication .....	168
Legal .....	169
Legal Intelligence .....	169
Water Supply and Sanitary Matters .....	169
Our Office Table .....	190
Meetings for the Ensuing Week .....	191
Trade News .....	192
Tenders .....	192

## ILLUSTRATIONS.

"THE MISER."—NEW SAVINGS BANK, GLASGOW.—FOUR HOUSES AT HELENSBURGH.—COMPETITION DESIGNS FOR THE SHOREDITCH PUBLIC BATHS AND FREE LIBRARY.—DARENTH BOARD SCHOOLS.—"BUILDING NEWS" CLUB DESIGNS FOR A SMALL PUBLIC BATH.	
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## Our Illustrations.

"OLD MASTERS" ON THE CONTINENT: XXX.—  
"THE MISER."

THIS painting is a striking one, full of character and force, well balanced and dignified in treatment, cleverly bespeaking its title. Little is known of its author, Giuseppe Nogari, a painter of the Venetian school, who was a scholar of Antonio Balestra, the historical painter of the school of Maratti, which was based upon the works of Raffaele as the models for its origin. Nogari was much employed as a portrait painter, and obtained a well-merited repute for his historical paintings, though we have no examples of his work in the National Gallery, and none seem to be possessed by the Louvre. The present specimen is in the Picture Gallery at Dresden. The artist was born in 1700, and died in 1763.

## SAVINGS BANK, GLASGOW.

OUR sketches show the exterior and interior of the extension to the National Security Savings Bank of Glasgow, now in course of construction. It is a one-story building, in deference to the desire of the National Debt Commissioners. The style of architecture of the addition is in sympathy with the present structure, which is of a plain and simple character. The building will be entirely fireproof; the safes and book stores occupying the basement floor. The telling room, with the actuary's, committee, and cloakrooms occupy the entire street floor of both old and new portions, are well lighted, and will be finished in a simple manner. The new building is situated at the corner of Glassford and Ingram streets, adjacent to the fine buildings of the Union Bank of Scotland, and will, we venture to think, add another interesting feature to the many fine architectural buildings in that part of the city (the older portion) in which it is situated. The architect is Mr. John James Burnet, A.R.S.A., of the firm of John Burnet, Son, and Campbell, Glasgow, and the estimated cost of the building is about £25,000. The models for the sculpture work to be placed over the main entrance door and windows are being prepared by Mr. George Frampton, A.R.A., of London, and the execution of the sculpture work will be by Mr. Wm. Shirreffs, of Glasgow. The contractors for the works are:—For mason work, Thaw and Campbell; for wright work, J. Cochrane, jun.; for slater work, A. M. Ross and Sons; for plumber work, Charles Cameron; for plaster work, R. A. McGilvray; for fireproofing work, Rad. A. Stofferit; for heating and ventilating work, Jas. Cormack and Son, all of Glasgow.

## HOUSES AT HELENSBURGH.

THESE houses are being built with the purpose of selling or letting, and economy in planning, in

ornament, and in construction, in so far as compatible with thoroughly sound work and some architectural effect, has been observed throughout. The site is on a hillside, with south frontage, and facing the sea, of which a distant view is obtained; accordingly, that all the houses may share these advantages, the front ones have been spaced as widely as possible, while those at the back have been placed together. With the same object, the main entrance is arranged at the end in each case, and the drawing-rooms in the houses at the rear have been placed on the upper floor. The main walls are of 18in. freestone rubble (2ft. at chimney breasts), with walls of kitchen offices, chimney-stacks, &c., of brick, all rough-cast in cement, and with dressings of red freestone from the neighbouring quarry of Auchencarroch. The external woodwork is of red pine coated with carbolineum. The principal contractors are: Mason-work, Mr. Anthony Trail and Mr. John Jack; joiner-work, Mr. Wm. Jack, all of Helensburgh. Mr. A. N. Paterson, M.A., is the architect.

## PUBLIC BATHS AND FREE LIBRARY, SHOREDITCH.

THE two designs reproduced to-day were photographed by us at the time of the exhibition as fairly typical examples of the variety of treatment adopted among the more noticeable schemes, and as the matter has attracted more than usual attention we give them in concluding our series of illustrations from this competition. The design marked No. 1, by Messrs. Brewill, Bailey, and Mallows, conceived on the idea of one grand façade, presents a building of a sturdy and monumental character, scarcely, however, in accord either with the neighbourhood or the purpose in view, the conditions stipulating as an essential provision that the library should be so designed as to be readily adaptable to being distinctly erected as a separate undertaking. Messrs. E. Thomas and Son's design (No. 14) was one of the three designs in which the large hall is located adjacent to Bowling Green-walk, with exit doors for emergency purposes opening directly into that thoroughfare—an unquestionable advantage, and necessary in order to comply with the regulations of the London County Council as stipulated in the conditions. The first six designs chosen by the referee have been on view this week at the Town Hall, Shoreditch, for reconsideration by the commissioners.

## DARENTH BOARD SCHOOLS.

THIS design for these schools was placed first in competition, and has since been carried out. The schools are situated centrally at Green Street Green, in the parish of Darenth, near Dartford, Kent, being a short distance from the recently-discovered Roman villa. They are designed to meet the requirements of the whole parish, and as a mixed school they accommodate 100 infants and 120 boys and girls. The two schoolrooms are divided by a movable folding partition, which, when thrown back against the wall, furnishes a room 75ft. by 22ft., which will provide the want of a parish room for local meetings, entertainments, &c. A dado, 4ft. high, is built of salt glazed bricks round the entire school and cloakrooms. The architect was Mr. Frank M. Kirby, Galley Hill, Greenhithe, Kent, and the contractors Messrs. Multon and Wallis, of Gravesend. The schools were built for £1,559.

## "BUILDING NEWS" DESIGNING CLUB: A SMALL PUBLIC BATH.

(See description on page 159.)

The dissolution of partnership is announced in the case of T. R. Sanders, jun., and W. G. Sileman, under the style of Sanders and Sileman, architects and surveyors, Bournemouth; and also in the case of R. Mason and F. G. Richards, under the style of Mason, Richards, and Swainson, of Manchester, architects and surveyors.

The interior of the church of St. Lawrence, at York, has recently been beautified by several special gifts. The three eastern windows, each of which is 50ft. in height, has been fitted with stained glass, executed by Mr. Knowles, of Stonegate, York. The entire chancel has been carved at those points where from lack of funds at the erection of the church the stonework was left in the rough. Another effective part of the work just completed is the mural decoration of the aisles, transepts, and baptistery. Since 1886 the parishioners have paid off a debt on the church of £500, enlarged the schools at a cost of £950, erected a tower and spire 160ft. high at a cost of £1,960, opened mission-rooms at a cost of £150, and secured a site for future church extension at a cost of £300.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

EDINBURGH ARCHITECTURAL SOCIETY.—A smoking concert under the auspices of this recently-formed society was held on Friday night in the Imperial Hotel. Councillor Cameron, who presided, explained that the society was composed only of professional men, and had a membership of over 60 architects' assistants. The object of the society was mutual benefit in the study of professional work by means of an annual course of lectures and a series of visits to old and new notable buildings.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.—The 17th annual report, to be presented at the meeting of the society to be held to-morrow (Saturday) afternoon, at St. Paul's Chapter House, E.C., states that seven meetings have been held at the Chapter House during the year, at which papers have been read by Mr. Leland L. Duncan, F.S.A., Dr. Reginald Eager, by the Right Rev. the Bishop of Stepney, and Messrs. Andrew Oliver, R. A. S. Macalister, and Richard B. Holt. An exhibition of objects of ecclesiastical interest occupied one evening, as in previous years. Afternoon visits were made to the Crypt of St. John, Clerkenwell, Sir John Soane's Museum, and the parish churches of Chislehurst, Kingsbury and Hendon, Bromley, Beckenham, Willingale Spain, Hornchurch and Upminster. A whole-day excursion was made to Peterborough. The balance sheet shows an excess of expenditure over receipts to the extent of £7, but this is chiefly due to the outlay upon the *Transactions*.

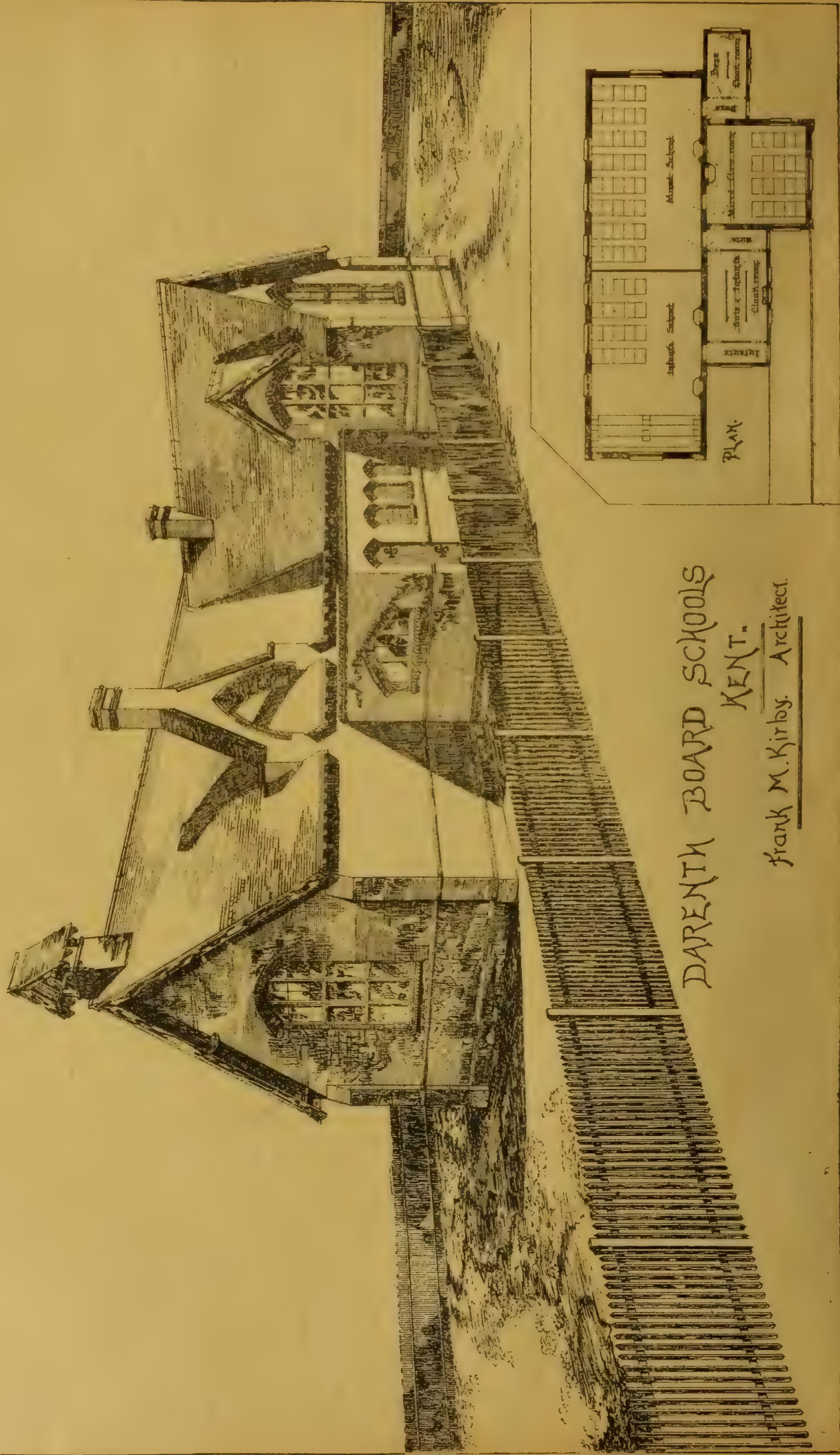
YORK ARCHITECTURAL SOCIETY.—A very appreciable social gathering took place in connection with this society at Harker's Hotel, York, on Saturday evening. The President, Mr. Henry Perkin, F.R.I.B.A., presided, and the numerous company of members and friends present included Mr. Wheeler Smith, president, and Mr. B. D. Fairbank, hon. secretary of the Bradford Society of Architects and Surveyors. The President remarked that the society still flourished, and expressed the hope that it would long continue to do so. A capital list of lectures had been arranged for the present session, and, as before, they would be given at the Church Institute, and were open to members and friends. It was very much to be regretted that the corporation had been unable to acquire the whole of the property abutting on the Abbey Walls in Bootham; as new premises had been erected, it might be assumed that the property would never be purchased. The purchase of the bit at the corner of Marygate was certainly a step in the right direction. They regretted, however, that a portion of the abbey walls had been disturbed during the execution of the improvement, inasmuch as the rebuilding of them had somewhat destroyed the old interest. York, he was glad to see, still grew apace: it contained some very excellent and some very inferior art pitchforked here and there. When should we, he queried, be able to discriminate between the good and the bad? In conclusion, the president presented to Mr. J. J. Kempley, a pupil of Mr. W. G. Panty, F.R.I.B.A., York, the society's prize, value £3 3s., which he had won for a set of drawings for a village club-house. Mr. Wheeler Smith proposed the health of the president and secretary (Mr. A. B. Burleigh). In addition to the musical portion of the programme, there was an exhibition of limelight views illustrating Venice and scenes on the Riviera, and these were briefly explained by Mr. John Lane.

Special services were held in the parish church, Totnes, on Friday, on the occasion of the opening of the organ, which has been transferred to the north chapel, rebuilt, enlarged, and modernised by Messrs. Hale and Co., of Plymouth and Exeter.

A marble bust of the late Robert Louis Stevenson has just been placed in position in the Scottish National Portrait Gallery at Edinburgh. The bust is the work of Mr. D. W. Stevenson, R.S.A., and represents the brilliant essayist and romancer in the costume he wore in his island home in the South Seas. The bust was exhibited at the Royal Academy last year.

Alexander Templeton Hawkins, the managing director of the National Dwelling Society, was convicted on Friday, after several days' trial, of misappropriating money belonging to the society, and omitting to make proper entries in its books. On Monday the Lord Chief Justice, in passing sentence, said the evidence of the prisoner's guilt was perfectly conclusive, and he sentenced him to five years' penal servitude.





PARENTS BOARD SCHOOLS  
KENT.

Frank M. Kirby. Architect.

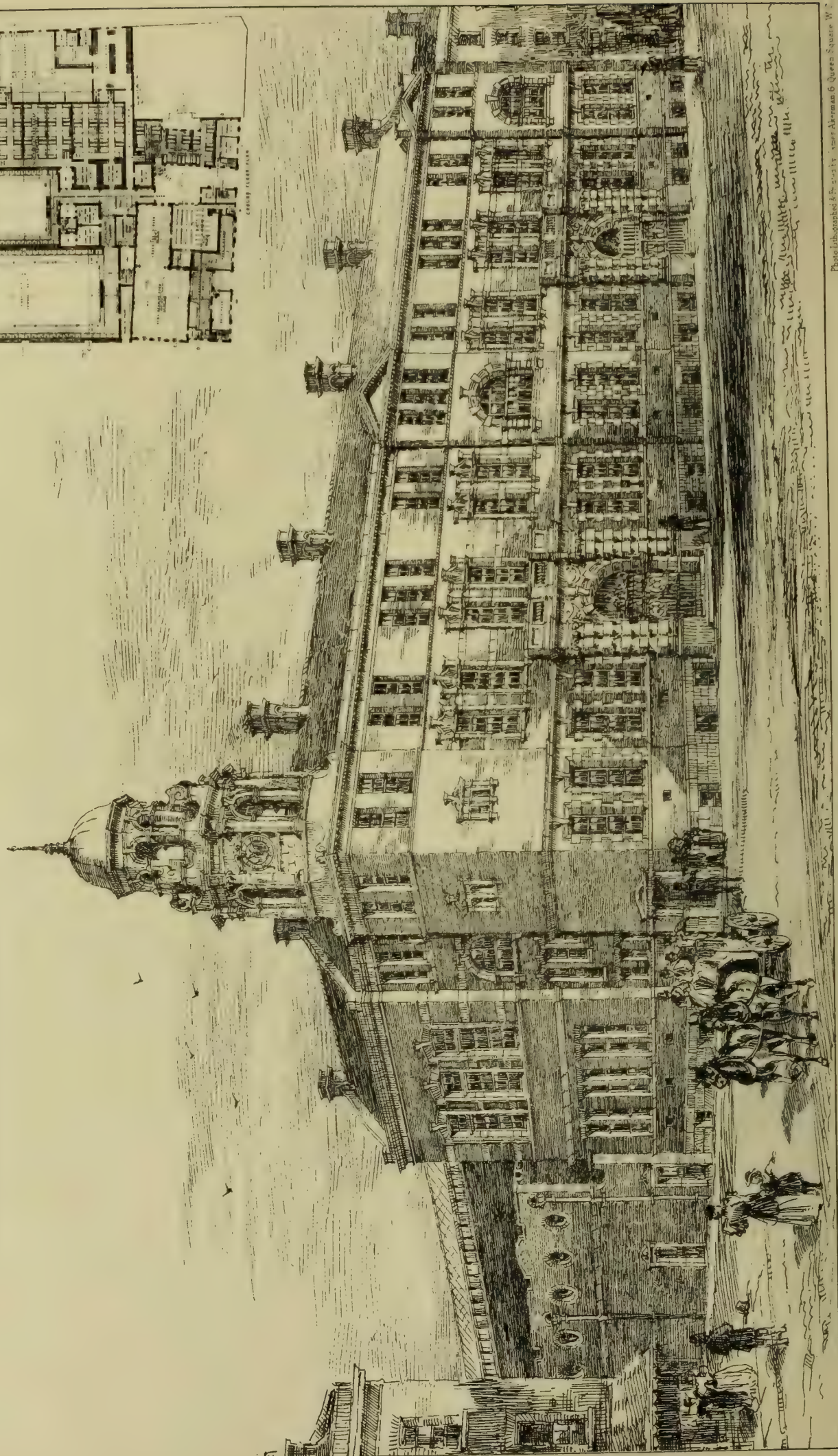






PUBLIC BATHS & FREE LIBRARY (PASSMORE EDWARDS) SHOREDITCH.

DESIGN NO 14. SUBMITTED BY ED. THOMAS & SON.

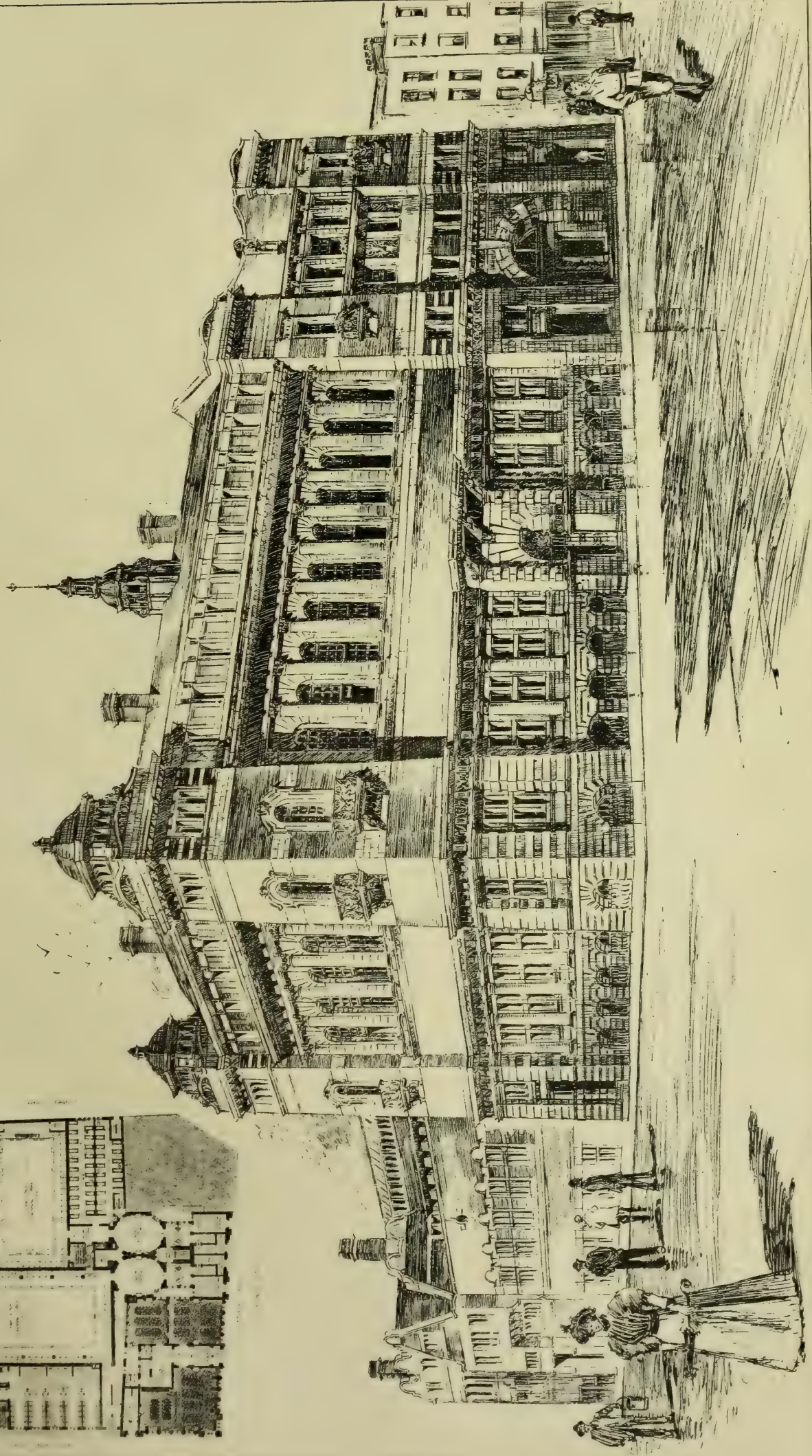
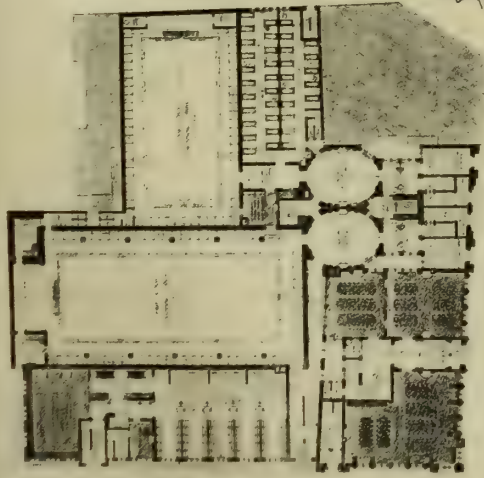




THE BUILDING NEWS, JAN. 31, 1896.

PUBLIC BATHS & FREE LIBRARY (PASSMORE EDWARDS) SHOREDITCH.

DESIGN NO. 1. SUBMITTED BY MESS<sup>RS</sup> BREWILL & BAILEY, & C. E. MALLOWES.



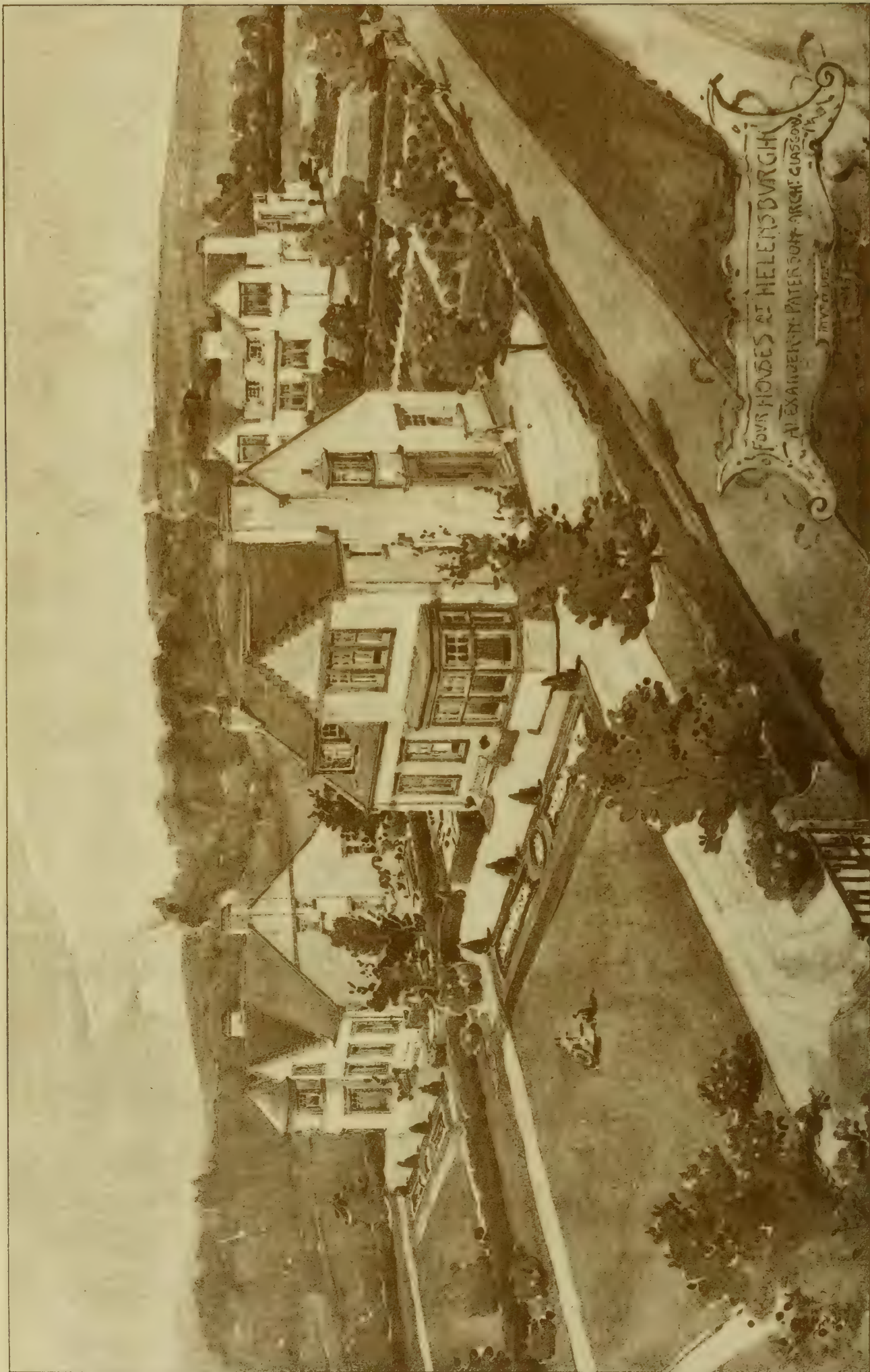














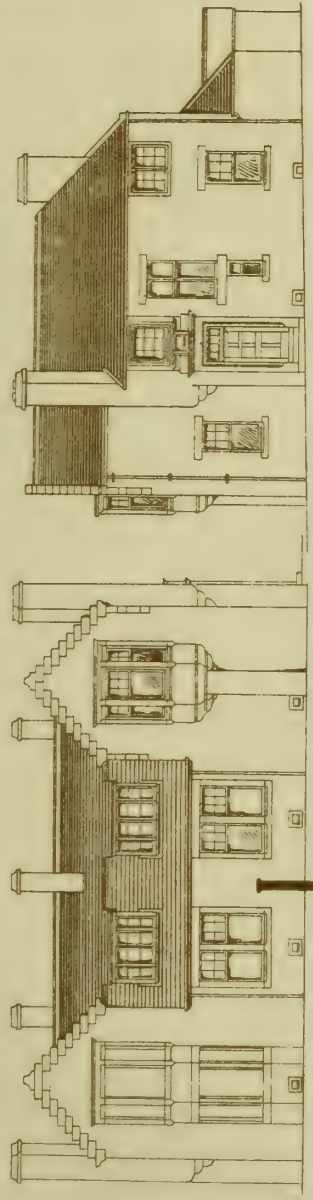


SOUTH ELEVATION

EAST ELEVATION



GROUND FLOOR PLAN



SOUTH ELEVATION

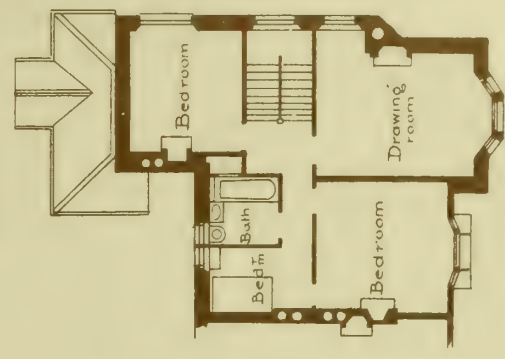
EAST ELEVATION



GROUND FLOOR PLAN



FIRST FLOOR PLAN



FIRST FLOOR PLAN



GROUND FLOOR PLAN



FIRST FLOOR PLAN

















— PHOTO BY FRANZ HANFSTAENGL —

OLD MASTERS · ON THE · CONTINENT · N° 30 ·

THE MISER (DRESDEN) BY GIUSEPPE NOGARI (B 1700 D 1763) VENETIAN SCHOOL

PHOTO-TINT by JAMES AGNEW & SONS, LONDON



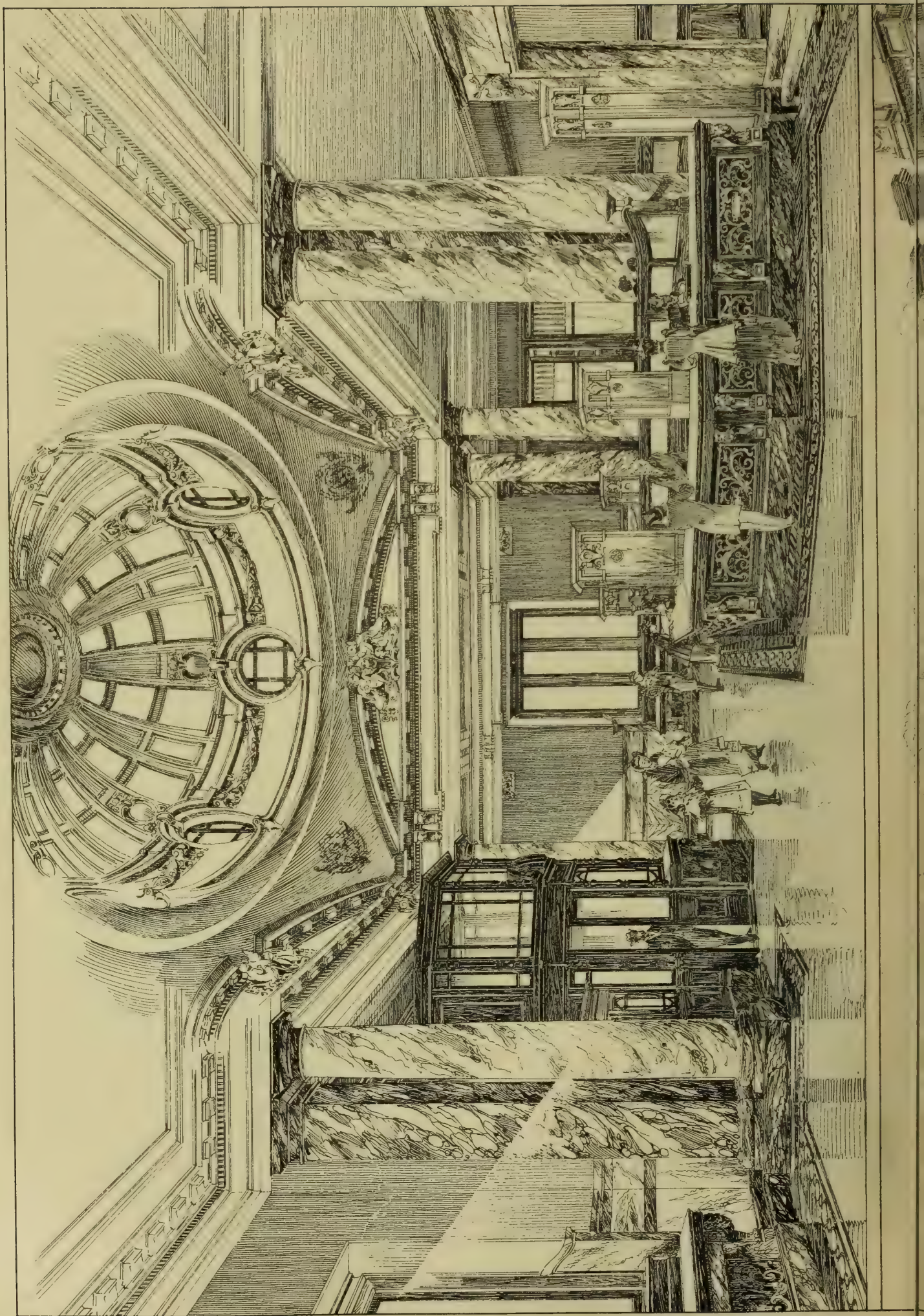




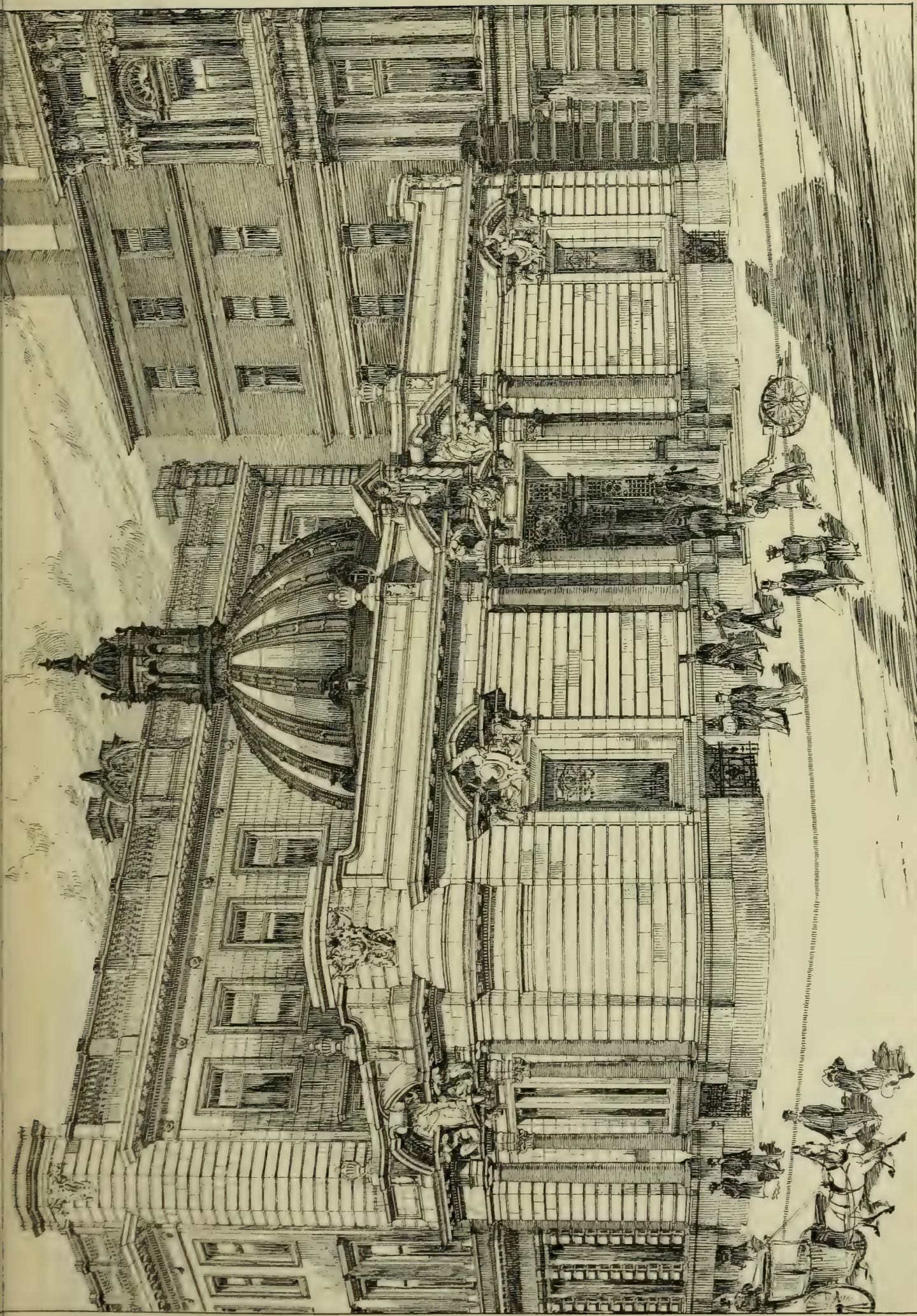




THE BUILDING DEWS, JAN. 31, 1896.







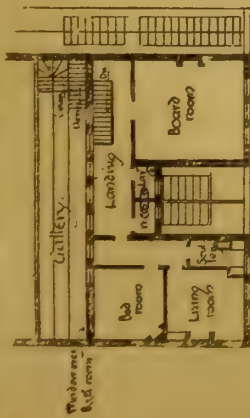
SAVINGS BANK, GLASGOW.

JOHN BURNET SON & CAMPBELL, ARCHITECTS.

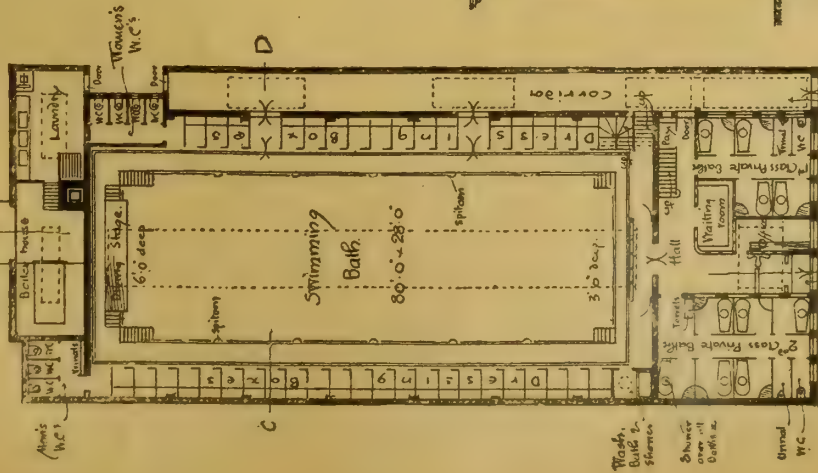








FIRST FLOOR PLAN:

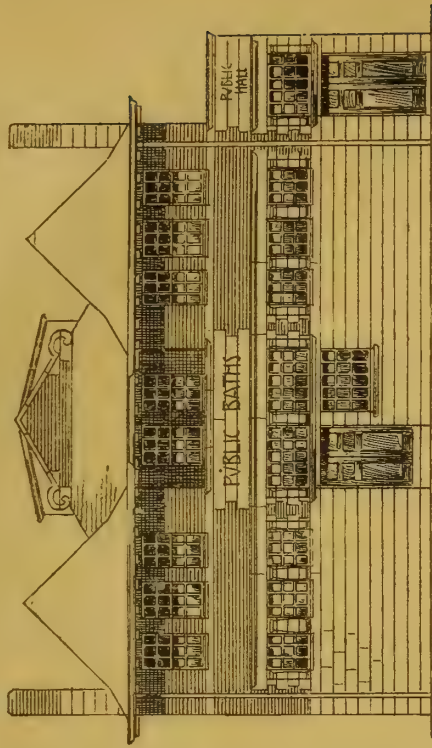
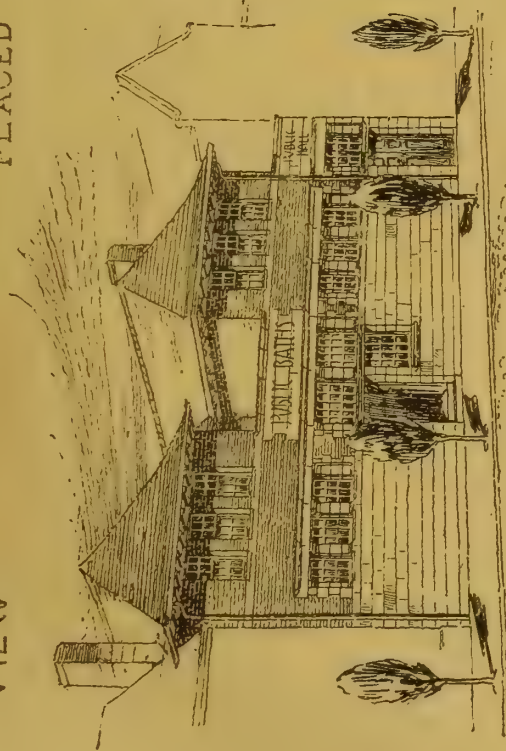


Note: Dotted lines indicate skylights

GROUND PLAN:

VIEW

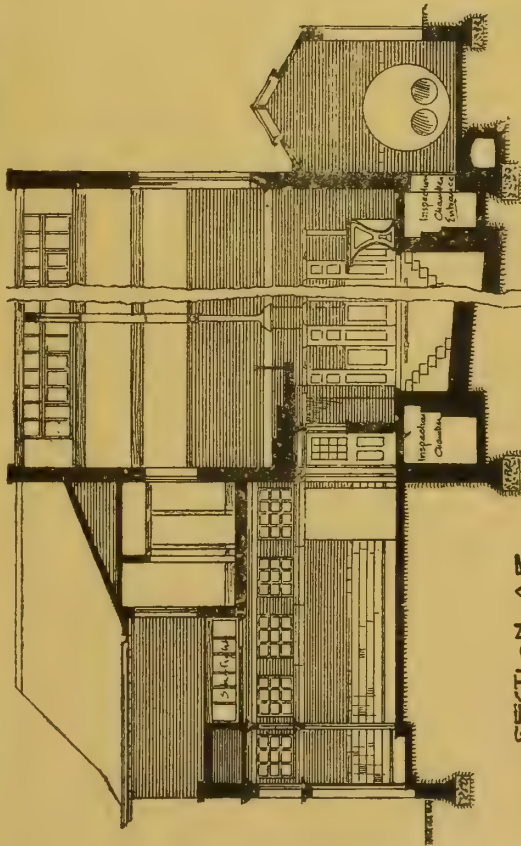
PLACED FIRST



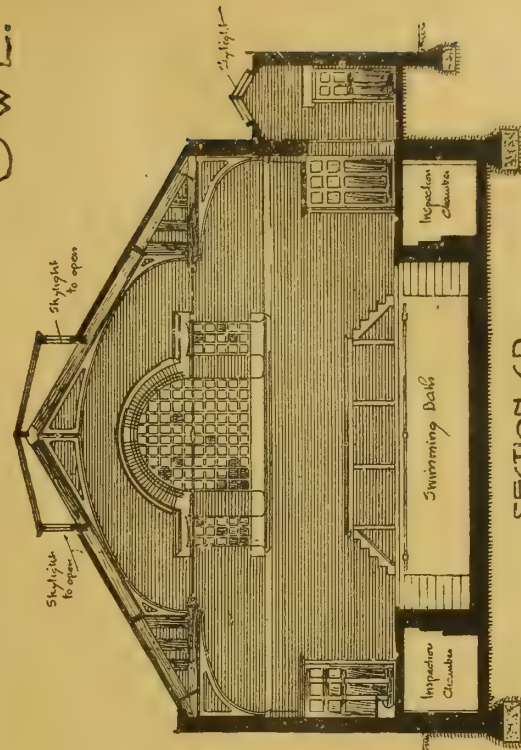
FRONT ELEVATION

B.N.D.C.: A SMALL PUBLIC BATHS:

BY THE  
OWL.



SECTION AB.



SECTION CD

SCALE FOR ELEVATIONS AND SECTIONS:

1" = 10' 0"

1" = 10' 0"

Dec 1/95



## Building Intelligence.

**BURSLER.**—On Thursday in last week, the public baths, which have been erected in the Moorland-road, opposite the railway station, by the Burslem Corporation, were opened. The building is constructed of red-pressed bricks and terracotta. The first-class swimming-bath has an area of 60ft. by 28ft. 6in., the depth varying from 3ft. 6in. to 6ft. Connected with it there are 41 dressing-boxes. The second-class swimming-bath is 75ft. by 33ft., and is capable of holding for ordinary bathing 74,000 gallons of water. There are twelve private baths for gentlemen and four for ladies. The Turkish baths have been arranged and constructed on an elaborate scale. The designs were prepared by Mr. F. Bettany, the borough surveyor of Burslem. The whole building has been fitted with the electric light. The building contract has been carried out by Mr. W. Cooke. The total cost of the baths has been £10,500.

**CONWAY.**—A new picture-gallery has just been completed for the Royal Cambrian Academy of Art, at Plas Mawr, Conway. The needs of a new gallery have long been felt. The old mansion, Plas Mawr, in which the annual exhibitions of the academy are held, is in every way in character with the use to which it is now devoted. There is, however, much of interest in the old ornamentation of its walls, which during the time of the annual exhibition, owing to the number of pictures, had had to be covered over, much to the regret of the members of the academy, and the loss of the public; and, owing to the windows being small, many pictures have been forced to be hung in dark corners. It was, therefore, determined to erect a new gallery, to accommodate a larger number of pictures. The old rooms, being less crowded with pictures, will show those remaining in them to greater advantage. The gallery has been erected on ground at the back of Plas Mawr, and is connected with it by a short passage opening out of one of the rooms on the first floor. The gallery is 45ft. long by 27ft. wide, is top-lighted, and is provided with ladies' and gentlemen's retiring-rooms. Besides being approached through Plas Mawr, it has a main entrance from Chapel-street, to be used on special occasions. The work has been carried out by Messrs. Edward Thorp and Son, contractors, Llandudno, under the personal supervision of Mr. Harold Hughes, A.R.I.B.A., A.R.C.A., from plans by Messrs. A. Baker and Harold Hughes, Bangor and London.

**EDINBURGH.**—The new Calton Tunnel, part of the contract for the improvement of the Waverley Station and its approaches, is being carried out by Messrs. Watt and Wilson, Glasgow. The new tunnel through the Calton Hill is on the north side of that now in existence, which was made half a century ago, but there is a rock barrier 25ft. in thickness between the tunnels. The new tunnel is 420 yards in length, or about 50 yards longer than the old one, and it forms a section of the two sets of double lines which will extend from Corstorphine to Portobello. The present contract begins at New-street, where a new girder bridge is in course of construction to carry the two double lines over the roadway. From the north-east end of the new bridge a heavy retaining wall will be erected, so as to screen the railway from the Calton Rock, and safeguard the line from falls of loose stone. This wall will terminate at the entrance to the new tunnel, which is faced with ashlar masonry. The height of the tunnel is 23ft., and its width 27ft.—it being intended for two lines of rails. It is horse-shoe in shape, and is lined at the west end, where the rock is hardest, with five rings of brick, the face being of hard blue brick from Omoa. From a point nearly half-way along the tunnel to the east end there will be six rings of brick, as the rock becomes of a friable nature. The rock is igneous in its formation, and at the west end of the tunnel is, for the most part, a hard blue trap. This hard rock was bored with diamond drills driven by compressed air and blasted with gelignite. An ordinary pick sufficed to excavate the softer material. The tunnel will be finished in the month of April. Between 300 and 400 men are employed on the job. The quantity of material removed has amounted to about 35,000 tons. A considerable part of that has gone to Leith to be used up in the making of concrete at the new docks. From the east end of the tunnel a heavy retaining wall of masonry was required between the

railway and the Regent-road Garden. This wall is 50ft. in height at its highest part, with a maximum thickness of 14ft. Its height descends with the slope of the garden from 50ft. to about 6ft. The new line is carried over the Abbeyhill-road by a girder bridge, the outside member of which is 200ft. in length. The work is executed under the personal superintendence of Mr. John Watt, jun. The contractors' engineer is Mr. T. B. Penny.

**ORMSKIRK.**—The new cottage hospital in Hants-lane was opened by the Countess of Derby on Friday. The building consists of three blocks on the pavilion system, connected by a corridor 55ft. long by 8ft. wide. The central block provides entrance lobby, operating-room, and bath-room, and a ward for two beds. At either end of the corridor is a ward, each with space for three beds. The sanitary blocks are disconnected from the wards by a ventilated lobby. The three wards face the south. The floors are of red pine, oil-stained and varnished. The warming and ventilation are by Manchester and ordinary open grates and iron fresh-air pipes. In the corridor are two coils of hot-water pipes, which are heated by means of a Halifax independent boiler. This also provides the hot-water supply throughout the building. Externally the building is built of grey St. Helen's brick, with red brick dressings and red sandstone sills. The roof is covered with Staffordshire red tiles. The gables of the two main wards are filled in with half-timbered work, and grey cement panels, designed and carved by the architect. The contractor was Mr. James Pilkington, of Rainford. The architect is Mr. C. S. Beeston, of Ormskirk.

**MANCHESTER.**—The foreign animals wharf on the Ship Canal at Mode Wheel, built by the Manchester Corporation from plans by the city surveyor, will be ready for use in the spring. The wharf extends about 800ft. along the canal side at the Manchester docks. A timber jetty, on piles, has been built along the whole length of the wharf, and tramway rails, on which a moveable crane will run, have been put down. The lairs are immediately behind the landing-stage, and will accommodate 1,000 oxen. Water and feeding troughs have been laid down, and provision is made for cleansing each stall. The lairs are built of brick, with slate and steel roofs, and are lighted from above. They are built in compartments, which will isolate the cattle in groups of 100. Of necessity, the lairage drains are from 12ft. to 15ft. below the level of the Manchester main sewer, over three-quarters of a mile away. The drainage, therefore, will have to be pumped upwards along that distance into the main sewer. A covered auction-room, with central ring, has been built directly in the rear of the lairs. The cooling-house at the slaughter-house, which is 134ft. deep by 52ft. wide, is faced with white glazed bricks.

**SALISBURY.**—A public meeting was held at the Council House, Salisbury, on Tuesday, to consider what further steps should be taken for the preservation and repair of Salisbury Cathedral spire. The Dean made a general statement as to the condition of the cathedral tower and spire, and Sir Arthur Blomfield, A.R.A., gave the substance of his report on the subject. The Bishop of Salisbury moved:—"That the condition of the tower and spire of the cathedral renders it necessary that steps should be taken with a view to its repair and preservation." The Hon. Percy Wyndham seconded the resolution, which was carried unanimously. Earl Nelson moved:—"That the report on the tower and spire prepared by the architect, Sir A. Blomfield, appears to indicate the right lines upon which the work should be carried out." This was seconded by Colonel Williams, and carried. On the motion of the Earl of Radnor, seconded by Mr. Halse, M.P., it was decided that further subscriptions should be invited. The dean announced several fresh subscriptions, among them being a donation of £100 from the Queen.

**TWESBURY ABBEY.**—A meeting of the Abbey Restoration Committee was held at Tewkesbury, on Tuesday week, to consider the report of Mr. J. Oldrid Scott, F.S.A., the architect, on the state of the fabric of the abbey. Mr. Scott stated that the time had arrived when it was necessary to deal with some parts of the external walls and with a portion of the lead roofs. The lower part of the walls was at one time covered to a height of 3ft. or 4ft. by the soil which had accumulated round the building. This soil was removed several years ago, and the exposed stone-

work repaired. For some time it stood well; but it seemed to have suffered some serious injury by being thus buried and then exposed to the effects of air and frost. The coping of the west end of the south aisle is in a very bad state, the stones are much broken and decayed, and the weather is thus able to penetrate the wall below. This should be set right without delay. There are places in the south transept which require attention, and especially it seemed to him desirable to repair the large crack which runs through nearly the whole height of the gable wall. One of the most urgent matters is the beautiful stone paneling on the exterior of the south aisle wall, which once formed a part of the cloister. This delicate work was never intended to be exposed to the weather, as it has been ever since the cloister perished. The stone used seems quite unable to stand the action of the weather, and it is now perishing rapidly—some details of the stonework have already gone, and many parts are ready to fall away when touched. Steps should be taken immediately to arrest the decay, and he advised the application of some chemical solution to the surface of the old stonework. Mr. Scott also reported on the lead covering of the roofs. Not less than £700 should be raised for the expenses of the next twelve months. The repairs were all of an important and even urgent nature. No attempt at anything like "restoration" would be made, nor should there be any idea of removing the worn and rugged character which so much of the stonework had acquired. It was agreed that the committee should issue an appeal for assistance to carry out the immediate restoration work required by the architect, and also to provide a permanent fund for the proper maintenance of the abbey.

### CHIPS.

The Waterworks Committee of the Bradford Corporation decided, on Friday, to recommend the advance of the salary of Mr. Watson, the waterworks engineer, to 1,250 per annum. Mr. Watson was appointed in December, 1890, at a salary of £1,000.

A sessional meeting of the Sanitary Institute will be held at the Parkes Museum on Wednesday, Feb. 12th, at 8 p.m., when Dr. S. Monckton Copeman will open a discussion on "The Influence of Subsoil Water on Health."

Branksa Castle, situate at the mouth of Poole Harbour, the picturesque seat of Captain Balfour, 1st Royal Dragoons, was demolished by fire on Sunday. The castle was originally built in the reign of Henry VIII. Branksa Castle was for many years occupied by the late Right Hon. G. Cavendish Bentinck, M.P., and was bought three years since by Captain Balfour, who has spent a considerable sum in furnishing. The damage is said to amount to nearly £20,000. The oak staircase and panelling was destroyed.

Colonel C. H. Laard, one of the inspectors of the Local Government Board, held an inquiry at Warwick, on Friday, in reference to an application of the corporation for power to borrow £1,750, for purposes of waterworks. Mr. Melville Richards, the borough surveyor, explained the plans, and showed that the money was needed to make additional adits from the wells constructed in 1875 in the glacial drift at Haseley.

A site has just been secured in Commercial-road, Whitechapel, at a cost of £15,000, for the East End Synagogue, which it is proposed to build in place of the old Hambro Synagogue in Fenchurch-street, demolished in 1890. The new building will accommodate 1,000 male and 400 female worshippers, and attached to it will be a Hebrew library, a court-house, assembly hall, and other rooms.

Extensive building operations are still in progress at Eastleigh, Hants. Fifty six-roomed cottages are about to be erected, opposite the entrance to the railway works on Bishopstoke-road, by Mr. Sydney Nichols, of Southampton.

The old Primitive Methodist chapel at Aspatria has become much too small for the requirements of the growing cause at that place, and on Thursday in last week a new church was formally opened. The new building will accommodate about 250 people. The plans have been prepared by Mr. W. G. Scott, of Workington, and the estimated cost £1,200.

In the south transept of St. Michael's Church, Shute, West Devon, a monument has been erected by Sir William Edmund Pole, Bart., in memory of the late Lady Pole, and three daughters who died in infancy. The sculpture is in high relief, and represents Lady Pole as a matron, clad in ethereal drapery, with her three children clinging to her or clasped in her arms. Messrs. Harry Hems and Sons, of Exeter, executed the work.



ADDITIONS TO THE NATIONAL GALLERY COLLECTION.

SEVERAL fresh pictures have recently been hung on the walls of the National Gallery, including four by modern British artists (one of these works being on loan only) and two by 15th-century painters of the School of Lombardy. No. 1458 represents "A Galliot in a Gale," by John Sell Cotman, 1782-1842, the son of a linen-draper in London-street, Norwich, and the second example in the Trafalgar-square collection of his work. A single rift in a leaden-grey sky reveals a patch of bright blue, and casts a bright light on a trough between crested masses of billows. A clumsy, broad-beamed Dutch sailing vessel is bearing away from us, with mainsail set and all hands alert, making with the wind for harbour. The windmills, churches, and houses of the port are seen to the right, under the face of lofty chalk cliffs; to the left, the composition is balanced by a second smack under sail in mid-distance, and three or four kittiwakes float in the sky between the ship and the shore. The effect is realistic, although in these days of snapshot photography we are unaccustomed to see on the canvases of Hook, Somerscales, Brett, or the late Henry Moore such huge waves. The picture is 46in. high by 58in. wide, and is hung on the south wall of Room XX.

No. 1460, which has been purchased out of the Lewis Fund, is by Julius Caesar Ibbetson (1759-1817), and is entitled "Smugglers on the Irish Coast," 33in. high by 23in. wide. On the shores of a broad lough, inclosed by mountains and isolated cliffs, recalling those near Mogher, Co. Galway, a cargo has just been run ashore, and the bold peasantry, with the aid of horses and asses, are busily employed in conveying the goods to places of concealment before the coastguardsmen appear on the scene. The men are attired in the conventional Irish costume, and there are a few women and children in the animated groups. Some are riding off on well-laden horses, others are drinking, and some are still unloading a boat; but we fail to see any engaged in a fight—an omission which deprives the picture of the local colour desirable in a popular work. This is the first picture acquired by this artist, who was almost as well known as an historical painter as a landscapist; it is hung on the east wall of Room XIX.

"A Landscape with View of Oxford," by Robert H. Ladbroke (1770-1842), measures 24in. high by 29in. wide, is numbered 1467, and is skied at the south-west corner of Room XX. It has been purchased out of the Lewis fund, and, like the picture just described, is the only example of the painter in the collection. Enframing a shallow pool in which three red, brown, and white cows are standing are some elms in full foliage, and beneath and between the branches, across the fields and Christchurch meadows, are seen the city and University buildings, the dome of the Radcliffe Library, and St. Mary's spire, and the two towers of All Souls being conspicuous in the centre, while far to the right is Magdalen Tower.

Yet another example from the prolific brush of Sir Edwin Landseer (1802-73) has been hung in Room XX., as a loan by Mr. Edwin L. Mackenzie. It is 40in. in height, 30in. wide, and is of great interest as a portrait of the animal painter's father, John Landseer, A.R.A., the engraver. It is a full-length figure of an elderly gentleman whose grey hair has grown very thin in front bringing into prominence a lofty forehead. He is attired in the dark blue coat, figured waistcoat, and white kerchief of sixty years ago, and holds before him with both hands, at watch-pocket level, a little red-edge volume, over which he is looking forward in a contemplative attitude. The work ought eventually to find its way to the National Portrait Gallery, now in course of arrangement next door.

The two new foreign examples are both by members of the School of Lombardy, each hitherto unrepresented in the collection, and were hung side by side on the north wall of Room IX. for the first time on Monday afternoon. No. 1465 is "Christ Rising from the Tomb," and is by Gaudentio Ferrari (1484-1549). On the edge of a flat ledged marble sarcophagus embedded in the ground stands the risen Saviour arrayed in a single green garment that reveals the wound in his side, and the stigmata in hands and feet. The expression is pensive, sweet, and restful; the right hand is raised to heaven in the attitude of benediction, and left grasps a reed bearing a white scroll banner. The background is formed by cold grey mountains, and not a sign of foliage

or loose stone is shown. The size of the picture is 58in. high by 33in. wide. Ferrari was one of the most powerful masters of the early years of the seventeenth century, and this work is characteristic in the life-like movement, and intense expression displayed, and the low and inharmonious range of colouring. The largest collection of his works is in the gallery at Turin.

No. 1466 is a curious anachronous rendering of "The Walk to Emmaus," by Lelio Orsi, 1511-'87, a native of Novellara, and one of the imitators of Correggio. Under a gloomy sky, overcast with striated clouds, are seen advancing three men dressed as 16th-century Italian peasants, with large slouch hats, coats, and breeches. The mysterious Stranger walks in the centre, and is evidently expounding the prophecies to the disciples, each of whom is armed with a short straight dagger and a stout ashen staff. In the foreground a couple of chaffinches are unconcernedly pecking away almost under the wayfarers' feet. The picture is 22in. high by 27in. wide.

BOOKS RECEIVED.

*Economical Houses*, by HENRY GOLDSMITH, architect (Manchester: George Falkner and Sons, The Deansgate Press), is a well printed and bound volume of sketch-book shape, full of illustrations of houses, erected from the author's designs, of more or less artistic pretensions, with outline plans and descriptive notes of the materials and actual cost of each. The illustrations are chiefly in half-tone from negatives prepared by the author from the actual buildings. Books of this sort are so numerous that it is hard to recommend any one in particular; the designs here illustrated have been built, and, therefore, the estimates can be accepted without much question, though from the details and finish of some of them we should not like to guarantee their erection at the estimate named in other localities. Looking at random through the work, we notice that the author's *penchant* for angular bays and gables betrays him into some undesirable arrangements; they may be useful sometimes to obtain a good prospect, though rather costly in roofing, to say nothing of the awkward acute corners made as in design plates 4 and 19. The roofing of such examples as those on plates 72 and 73 and 77 is, to say the least, complex. Among the better and more simply treated houses we may mention those on Plates 7, 8, and 9. We notice approvingly the use of cavity walls, faced with Ruabon red stocks in black mortar. The upper stories are treated in half-timbered work. On the whole, the plans would be improved if there were less breaks in the outer walls, except where absolutely necessary for effect. Mr. Goldsmith's chief aim is a worthy one—to show that reasonably priced houses may be built with artistic outlines and with good rooms full of sunlight and cheerfulness. Possibly many of the houses shown are good examples of these qualities, but the reproduction in other sites of the same designs often leads to disappointment. Still the author's work may be suggestive even to those whom he chiefly has in view, who are desirous of erecting their own residences—by no means a very wise class of person. The different styles of letter-press, the scrolls, flourishings, and tailpieces spoil the unity of the work, and are rather distracting.

—*Sell's Registered Telegraphic Addresses Directory* for 1896 is more valuable than ever. It is deservedly distinguished by the recognition and co-operation of the Postmaster-General, and consequently always reliable and up to date. —*Laxton's Builders' Price-Book* for 1896 has been completely revised, and alterations in prices made up to the latest date. A new feature in this edition is the rules of procedure in cases to be brought before the Tribunal of Appeal appointed under the London Building Act, 1894; also a new form of "Agreement and Schedule of Conditions for Building Contracts," lately issued by the Royal Institute of British Architects, which supercedes a form of "Heads of Conditions of Builders' Contract" originally agreed to between the Institute and the Builders' Society, but now withdrawn from general use.

The Egyptian Government has, the *Athenaeum* states, at last interfered to prevent any further destruction of the ancient fortress of Kasr-ash-Shammah, the Babylon of Roman and Medieval times. It is also intended to put the old Christian churches of Egypt under the care of a committee similar to that which already exists for the protection of the mosques.

OBITUARY.

No more appropriate resting-place could be found for "our admirable LEIGHTON—painter, sculptor, orator, linguist, musician, soldier, and, above all, a dear good fellow," as Millais so happily described his friend and rival when presiding, in his absence, at last year's Academy dinner—than the Painters' Corner of St. Paul's crypt, in the one remaining space immediately adjoining Sir Christopher Wren's grave, and hard by those of Turner and Landseer. There, at the well-lighted south-east termination of the aisle, beneath the cathedral in whose restoration and decoration he had shown a keen interest, will the late P.R.A. be buried at noon on Monday next. The story of his career and triumph has been so fully and so often told elsewhere during the present week, that it is perhaps hardly necessary to add more than that a lifelike and excellent portrait of Sir Frederic Leighton was given in the *BUILDING NEWS* for May 9, 1890; his sumptuous home in Holland Park, Kensington, designed by Professor Geo. Aitchison, A.R.A., which, it is understood, has been bequeathed to the Royal Academy as an official residence for future presidents, was illustrated in our issues of Dec. 22, 1876, Oct. 1 and 8, 1878; and his version in marble of "An Athlete Struggling with a Python," shown at Burlington House in 1891, was reproduced by us as a photoint on May, 22, 1891. The conception, it will be remembered, was originally shown at the same exhibition in 1877, executed in bronze, and that group is now a conspicuous feature of the Chantrey Collection at South Kensington Museum. The Royal Gold Medal for distinction in architecture and the allied arts was conferred on Lord Leighton of Stretton, or rather as he then was, and will be best known, on Sir Frederic Leighton by the R.I.B.A., of which body he had been an Hon. Associate since the creation of that anomalous class in 1877.

Mr. DANIEL KINNEAR CLARK, M.Inst.C.E., died on Wednesday week at 8, Buckingham-street, Strand, aged 74 years. He was chiefly known as a writer on engineering subjects, his works including "Tramways: their Construction and Working," of which a second and enlarged edition was issued last year, "The Steam-Engine and Boiler," in two volumes, and "Railway Machinery." He was also the compiler of the "Mechanical Engineer's Pocket-book," with tables, formulae, rules, and data, "The Boiler-Maker's Ready Reckoner," and "A Manual of Rules, Tables, and Data for Mechanical Engineers." He had been a member of the Institution of Civil Engineers since 1854, and had been awarded by them the Telford Medal and the Miller Prize for essays—some of many papers he contributed to their *Transactions*.

Mr. STANHOPE BULL, county surveyor of Cheshire, and younger son of the late Rev. George Stringer Bull, of St. Thomas's, Birmingham, died on Thursday, the 23rd inst., at his residence, Bosville, Liverpool-road, Chester, in his 59th year.

The death is announced, at an advanced age, of Mr. THOMAS WELLS, architect, of Randolph's House, Buddenden, near Cranbrook, Kent. Mr. Wells had been an Associate of the Royal Institute of British Architects, and also a member of the London Architectural Association, since 1867.

Mr. JOHN STEWARDSON, architect, of Philadelphia, was accidentally drowned while skating on the Schuylkill river on the evening of Jan. 6. Mr. Stewardson, who was educated at Harvard University and the Ecole des Beaux Arts and the Atelier Pascal at Paris, on his return to Philadelphia, entered into partnership with Mr. Cope, of that city. All their work was quite scholarly, and free from eccentricities; the best example is a group of dormitories added to Philadelphia University.

The foundation-stone of the new extension of the Hammersmith Synagogue, was laid by Dr. Adler, the Chief Rabbi, on Sunday. The work is being carried out from the designs of Mr. Delissa Joseph, the honorary architect, from whose plans the original building was executed.

At Hough Green, on Friday, Mr. Rieuzy Walton, M.I.C.E., an inspector of the Local Government Board, held an inquiry into the application of the Whiston Rural District Council for sanction to borrow £3,500 for the purpose of carrying out a sewerage system for the township of Ditton. The scheme was opposed on behalf of the corporation of Widnes.



## Engineering Notes.

**Barry Docks.**—The new deep-water lock at the Barry Docks, supplying a second entrance from the sea to the water area whence the South Wales steam coals are shipped, will be formally opened to-day (Friday). The new Lady Windsor lock is the deepest in the world—viz., 62ft.—as measured from invert to coping. The lock is 647ft. long and 65ft. wide. It is fitted with intermediate gates, dividing it into two sections, one being 233ft. and the other 414ft. in length. Direct-acting hydraulic pistons are employed to open and close the lock-gates. Like those of the dock, the walls of the new lock have been built vertical, the battering walls adopted in other works having been found to cause much inconvenience. Mr. J. Wolfe Barry, C.B., is the engineer.

### COMPETITIONS.

**Ashton-under-Lyne.**—The trustees of the Methodist New Connexion have decided to build a new chapel in Trafalgar-square, Ashton-under-Lyne, and as the result of a limited competition, the design of Mr. J. H. Burton has been accepted.

### CHIPS.

The Duke and Duchess of York will open the Great Hall block of the Church House on Tuesday, February 11, at twelve o'clock noon, as originally arranged. The two Archbishops and thirty-nine Bishops have signified their intention of attending.

Mr. Edwin John Brett, F.S.A., the well-known publisher and authority on armour, has bequeathed two valuable oil-paintings to the City Corporation for the Guildhall Art Gallery.

After long correspondence and negotiations, it has been decided to construct a new road, 30ft. wide and a mile in length, from Stockton-on-Tees to Haverton-hill. The work will be carried out from plans by Mr. K. F. Campbell, the borough surveyor of Stockton, at an estimated cost of £8,800, borne jointly by the Stockton Corporation, the Tees Conservancy Board, and H.M. Commissioners of Woods and Forests.

At the Coventry Police-court on Friday, William Samuel Parker, Stoney Stanton-road, was charged with a breach of the building by-laws by using unsuitably mixed mortar in the erection of houses in Leicester Causeway. Defendant said he had erected £14,950 worth of property in the city during the last eleven or twelve years, and had not had a complaint made against him for nearly twelve years. He called several men in his employ to prove that the mortar was properly made. The Bench imposed a fine of 10s. 6d. and costs.

A memorial stone was laid last week in the Staniland Board schools in Fyde-crescent, Stamford. The schools, which are on the central hall system, are being erected by Messrs. Parker and Son, of Wormgate, from plans prepared by Mr. James Rowell, and will provide accommodation for 696 children. Messrs. Parker's tender amounted to £3,899.

The 41st annual report of the Wesleyan Chapel Committee states that during the past year the committee have sanctioned 371 cases, as follows: 100 new chapels, at an estimated cost of £131,351; 115 alterations and enlargements cost £48,345, together with ministers' houses, schoolrooms, organs, and modifications of cases previously sanctioned, making a total estimated expenditure of £246,686. The increased sitting accommodation is for 17,354 persons. Under the head of erections completed are 313 cases, the total expenditure on which has been £261,257, and the total additional accommodation 16,226 sittings.

The London County Council have authorised the expenditure of £21,000 for the purchase of the property known as Aske's Schools, Hoxton, with a view to the buildings being utilised as a municipal technical school, and the playground as a public open space.

The Aberdeen Granite Association have taken up the question of promoting instruction in the study of granite statuary, and on Friday night a committee of the association decided to approach Mr. Pittendrigh McGillivray on the question, and as to whether he could recommend a suitable person as a teacher. The association will ask a contribution from the town council of Aberdeen towards the object, and will organise popular lectures on the subject.

At the half-yearly meeting of the City and South London Railway Company, held on Tuesday, the proposal of the directors to proceed forthwith with the extension to Finsbury-pavement, at an estimated cost of £280,000, was unanimously approved.

### TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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### ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

### SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

### NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLV, XLVI, XLVII, XLVIII, XLIX, L, LI, LII, LIII, LIV, LV, LVI, LVII, LVIII, LIX, LX, LXI, LXII, LXIII, LXIV, and LXV may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. J. Dalton.—B. A. and Co.—Civ. Eng.—E. S. (Bridport).—F. G. B.—E. Andrews.

## Correspondence.

### ARCHITECT'S FEES FOR PARTY-WALLS.

To the Editor of the BUILDING NEWS.

SIR,—Your report on the case "Selby v. Briggs and Sons" is inaccurate in one or two particulars. You state that the Building Act had been waived to save expense, and it would appear that I had neglected to enforce the Building Act, when the real facts are as follows:—

I certified the building of Mr. Simmons to be dangerous, and their south external wall was pulled down.

Mr. Selby, the surveyor acting for the building owner, arranged that the wall should be re-erected, so that Messrs. Briggs, when they covered the open space adjoining, might use it as a party-wall. The objection raised by Messrs. Briggs was that the building had been erected with dripping eaves, so that when the adjoining building was erected I should require the present roof to be cut away and a proper brick parapet built at a height of 15in. above the highest building.

Professor Roger Smith kindly attended to give evidence on behalf of Mr. Selby, who had himself paid Messrs. Kiddle for half the cost of the wall. The only point was whether Mr. Selby should be paid, as the wall could not be used as a party structure without making the alteration above described, and Judge French decided that Messrs. Briggs must pay the full amount and costs.—I am, &c.,

HENRY LOVEGROVE, District Surveyor.  
314, Old-street, E.C.

The new Free Church at Falkirk was opened on Friday. The building, which occupies a prominent site in New Market-street, and which includes, besides the church proper, hall and classrooms, has been erected at a cost of £7,000.

## Intercommunication.

### REPLIES.

[11474].—**Cheapside Cross.**—This cross, one of the nine erected by Edward I. to mark the resting-places of the body of Queen Eleanor, stood in the middle of the road facing Wood-street. It was built in 1290 by a mason from Canterbury. It is said to have consisted of three octagonal compartments, each supported by eight slender columns, the total height being about 36ft.—H. LOVEGROVE.

[11474].—**Cheapside Cross.**—Cheapside Cross stood in the middle of Cheapside, exactly opposite the southern end of Wood-street. Your correspondent should consult Wilkinson's "Londina Illustrata," Vol. II., where he will find a very interesting series of plates illustrating the cross, and its history:—"Cheapside Cross, as it appeared in 1547, with part of the procession of Edward VI. at his coronation at Westminster"; the cross in 1606; the cross and conduit, with part of the procession of the Queen Mother, Mary de Medici; the destruction of the cross in 1643; and a plan of part of Cheapside, showing the precise site of the cross and of the conduit. A full and well-written account of its history, occupying eight large quarto pages, accompanies the plate. The book referred to can be seen at the Guildhall Library.—W. SPARROW SIMMONS.

[11474].—**Cheapside Cross.**—Rimmer, in his "Ancient Stone Crosses of England" (1875), gives the sites of the Eleanor Crosses, as at Lincoln, Grantham, Stamford, Geddington, Northampton, Stony Stratford, Woburn, Dunstable, St. Alban's, Waltham, West Cheap, and Charing. The last rest but one, was therefore made at the St. Paul's (the west) end of Cheapside. The author just quoted, refers to it in these words:—"Cheapside Cross was demolished by order of Parliament in 1643; but this was not the original one, erected by Edward in memory of his queen, which fell into decay, and was supplanted by another in 1485. This again crumbled, and was rebuilt in 1640 in the Elizabethan style. There is a well-known print of the demolishing of Cheapside Cross, published not long after the event, and the circumstance was satirised in the "Percy Reliques." La Terre's "Entrée Royale de la Reine Mère du Roy" (A.D. 1698) is a print representing the procession of Mary de Medici going through Cheapside on her way to visit Charles I. and his queen. This gives a good view of the cross, with a smaller one some 50 yards behind it, whether east or west the engraving does not illustrate clearly, although one presumes, by the way the procession is moving, that it is to its east. The cross is shown as octagonal, surrounded by rather tall iron palings, and three tiers high, the top one terminating in a dome-shaped top, surmounted by a large cross. The two lower stories show niches filled by statues, and statues also occur on the angle buttresses of the first tier. The cross in the rear is less ornate. It takes almost the outline of an octagonal lighthouse, and a statue occurs on each east. The latter stand upon projecting corbels.—HARRY HEMS.

[11475].—**St. Machar.**—I have never heard of this saint, and can find no reference.—H. L.

[11475].—**St. Machar.**—This good man is not mentioned in Huzenbets's "Emblems of Saints" (3rd edition, 1882). Owen, in his "Sanctorale Catholicum" (1893), under date of Nov. 13, says that date is celebrated "At Aberdeen, in Scotland, of the patron St. Machar, Bishop of Moray, A.D. 780." Dr. Owen, like most other people, is not always quite accurate, and this date is disputed by the Rev. Dr. James Gammack, LL.D., formerly of Aberdeen University, but now of West Hartford, Conn., U.S.A. The learned doctor (who, in the BUILDING NEWS for March 11, 1897, contributed some interesting particulars upon St. Palladius) some time ago compiled a very exhaustive paper upon St. Machar from books and manuscripts in the Aberdeen University library. His conclusion is that Adam King, in his Calendar, is certainly wrong in his date of A.D. 897, and Dr. Owen's A.D. 780 is also an error. He opines that St. Machar was a disciple and companion of St. Columba in the 6th century (Columba was Abbot of Iona, Patron of Derry and of the Isle of Skye, and the Apostle of the Northern Picts, dying, I believe, A.D. 597). He seems to have been sent by St. Columba into the North-east of Scotland to build churches and convert the people. Further, he was directed to stop finally at the place where he found a river which curved round in its course like the head of his pastoral staff. He found this river at Aberdeen, where, after working many miracles, he built the original church on the site of the present cathedral. The latter stands to-day, let us hope, in all its granite solidity, a witness to the truth of the tale; and as a further proof, it passed through the godly purgings of the Scotch Reformation, and its plain dumpy granite towers are seen from afar. Dr. Gammack considers the story of St. Machar's afterwards going over to France and becoming Bishop of Tours a myth, having not the vestige of foundation.—HARRY HEMS.

[11476].—**Furniture Warehouse.**—I should advise "Furniture" to visit my district—the southern portion—and inspect some of the many warehouse-in, or near, Curtain-road. Generally, the floors should be of the strength of a medium warehouse, not for light goods, as some of the heavy pieces of furniture are stacked very close.—H. LOVEGROVE.

Colonel Ducat, R.E., held an inquiry at Newport, Mon, on Friday, into an application by the borough council to borrow £1,950 for the extension of St. Woolos Cemetery, and £600 for a proposed foot-bridge to connect Capel-crescent and Courtybella-terrace. There was no opposition offered.

Mrs. Fitzgerald, widow of Captain Fitzgerald, Wallhouse, who was one of the victims of the poisoning at the Stirling County Ball recently, has decided upon erecting a public hall for the village of Torphichen in memory of her late husband, and has entrusted Mr. J. W. Stewart, of the Brighouse, with the carrying out of her wishes.



## Legal.

### ROAD REPAIRS.

ORIGINAL leases usually contain covenants for the making and repairing of new roads, and where the roads have not been taken over by the local authorities, these covenants are important and enforceable; but where the character of the road has been altered since it was constructed, the question of liability for its repair may involve difficulties. This point was raised in the recent case of "The Corporation of London v. Barnes" (*Times*, Jan. 15), where the plaintiffs had sued for the cost of repairing certain roads in Islington which the defendant had by his lease covenanted to repair and keep in repair, the proportion he was to pay being ascertained and certified by the City architect for the time being; but, as a matter of fact, the road in question had been originally laid down in broken flints, and so approved by the City surveyor. When they came to need repair recently, however, the Corporation put down macadam instead of flint, as before. It was therefore argued by the defendant that the conversion of an old flint road into a new macadam road amounted to a substitution or alteration, and one outside the scope of the covenant. At the trial, the jury were asked whether it was reasonable to put macadam down upon a road originally approved as a flint road, and in changing foundations not reasonably necessary to do so. Mr. Justice Wright ruled that, under the covenant, the defendant could only be liable for reasonable repairs, and so gave judgment in his favour.

Upon application to the Court of Appeal for a new trial on the ground of misdirection, the Master of the Rolls said the case was perfectly plain. The defendant had, by his covenant, agreed to lay down a road to the satisfaction of the City surveyor. The flint road was then made, and accepted as satisfactory. Then, instead of repairing the old flint road, the surveyor had now turned it into an entirely different thing by making a macadamised road, which was doubtless an improvement; but it was no longer the same road. It was not the road which the defendant had covenanted to keep in repair, and therefore the covenant was no longer applicable. The direction of the judge to the jury was right, and the judgment for the defendant must be upheld, and so the appeal was dismissed.

FRED. WETHERFIELD, Solicitor.

1, Graham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my office, as above, by Tuesday morning to insure answer same week.

**W. S.—ARCHITECT.—CLIENT.—PLANS.**—When the work has been completed and paid for, it now seems that the client is entitled to have all the plans handed over to him.

**J. R.—TELEPHONE.—CONSENT.—TRESPASS.**—Without your consent, they had no right to run these wires over your ground; and it would be technically a trespass if they entered your garden. Give notice to remove them.

**T. W. T.—PARTY-WALL.—UNDER-PINNING, &c.**—The half of the wall should be purchased as a party-wall, and with all resulting rights to the purchaser that follow from his becoming part owner of the wall. He would then be able to do what is suggested.

The Lord Provost's Committee of the Edinburgh Town Council in charge of the erection of the buildings at the south end of the new North Bridge, have resolved, in view of the present pressure of public work in the department of the city architect, to recommend that competitive plans should be advertised for, embracing the whole street on both sides.

Mr. Rienzi Walton, Local Government Board inspector, held an inquiry at the Corporation Offices, Haringden, on Thursday in last week, in respect of the application of the town council to borrow £7,000 for the purpose of providing a cemetery at Holden Hall. The borough surveyor, Mr. B. Taylor, explained the plans, and Mr. J. Cartwright, borough surveyor of Bury, gave evidence in opposition to the scheme, the Bury Corporation having decided to oppose the proposal, as it would interfere with the water supply of the latter borough.

A stained-glass memorial window has been placed in the parish church of Connah's Quay, Flint. The window is lancet-headed, and has been divided into two tiers. The lower portion is filled with the subject of the meeting of our Lord with Martha and Mary after the death of their brother. The tomb of Lazarus is shown in the background. The upper portion of the window is occupied with a figure of the risen Christ arrayed in robes of diaphanous white. The window was executed by Messrs. Ballantine and Gardiner, of George-street, Edinburgh.

### LEGAL INTELLIGENCE.

**A QUESTION OF ANCIENT LIGHTS.—WAITE V. NEWBERRY.**—At the Assize Courts, Reading, on Thursday and Friday in last week, before the Official Referee (Mr. Ridley), this action was tried as to the amount of damage to be awarded for the obstruction of light to the window of the bar parlour and the kitchen windows of the Central Hotel, Friar-street, Reading, the property of Mr. Charles Waite, retired builder, of that town, owing to the building of a warehouse by Mr. Arthur Newberry, furniture dealer, Friar-street, Reading. The action was tried before Mr. Justice Kekewich in the Chancery Division on July 13, 1895, and referred to Mr. Ridley. Plaintiff's counsel explained, by the aid of models made by the plaintiff himself, the extent to which the plaintiff's property had been depreciated in value, consequent upon the alterations made by defendant to his premises. Where there was formerly a wall 7ft. high, a building 19ft. 2in. had been erected. The judge did not make a mandatory order for defendant to pull down the obstruction. Mr. Geo. W. Webb, F.R.I.B.A., Market-place Chambers, Reading, said in January, 1888, he prepared plans for the alteration of the Central Hotel, Friar-street. He then made a careful survey of the premises. Since the defendant's new buildings were erected the effect has been to diminish the light to the kitchen windows, and to make the room less convenient for business. The bar-parlour was also affected, but not so seriously as the kitchen. He valued the assessed damage to the premises consequent upon the obstruction at £20 per annum, one-fifth of the present rent, or at £623, thirty years' purchase. Mr. Joseph Morris, architect and surveyor and county surveyor, said he had had nearly forty years' experience. He confirmed all that Mr. Webb had said with regard to the plans, and concurred with him in the valuation of the plaintiff's premises and as to the diminution of the rental value. Mr. Charles Waite, the plaintiff, said he bought the Central Hotel lease, which now had five years to run, in December, 1886, and rebuilt it. Before the alteration the sky could be seen from each of the rooms mentioned, but now the sky was completely blocked out. Mr. Arthur Ayres, auctioneer, valuer, and estate agent, Market-place, Reading, put the depreciation of the property at £20 a year, and capitalised it at thirty years' purchase as freehold. Mr. George Shorter, a builder, said the depreciation in value of the plaintiff's premises was at least from £23 to £24 per annum, which on a thirty years' purchase would amount to £720. For the defendant it was argued that an exaggerated value had been placed on the house, which was only a beer house, though it was called a commercial hotel, and Mr. John Egginton, auctioneer, valuer, and estate agent, Friar-street, Reading, sold the house to Mr. Waite for £1,175. He valued the house at £2,300. The loss of light had not affected the commercial value of the house adversely to the extent of £1. Mr. F. W. Albury, of Reading, the defendant's architect for the new buildings, valued the plaintiff's premises at £2,250. He should not put the total loss at more than £2 a year. Mr. Chas. Smith, architect, of Friar-street, said he had had thirty-five years' experience in Reading. He did not think the loss of light would affect the commercial value of the house at all, which he valued at £2,250. The Referee, in giving judgment, said the plaintiff's claim was too high. These premises were certainly never well lighted; but still they were not subject to the infliction of a brick wall raised to a height of 19ft. There was, therefore, obviously a substantial interference with the light. He did not agree with the view taken by Mr. Smith, who said there was no business depreciation. On the other hand, he did not agree with the result of Mr. Webb's calculation. He should assess the damages the plaintiff was entitled to recover at £150.

**BUILDING OVER VAULTS.**—At Bow-street Police-court on Monday, Mr. Lushington heard a case under Section 22 of the London Building Act 1894, the London County Council being the complainants, and Messrs. Gorrill, builders, Peacock-street Works, Newington Butts, the defendants. Mr. Thomas Chilvers represented the County Council. Defendants were summoned for erecting a building beyond the general line of buildings on the western side of Lincoln's Inn-fields. No. 50, Lincoln's Inn-fields, was formerly fronted by a forecourt 45ft. long by 28ft. wide, with vaults extending under a portion of it. Early in 1895 the defendants demolished the old building, and erected a new one in its place. In addition to doing this they excavated the vaults in the forecourt, and erected on this site four offices above the level of the adjoining pavement. The roof was of concrete and iron, with skylights above. In the opinion of the Council, this was a building within Section 22 of the Act, and should not have been erected without their sanction. Mr. Chilvers cited several cases in support of the prosecution, and called Mr. Barry, surveyor under the County Council, and Mr. Forster Hayward, district surveyor of St. Giles's district. Mr. Lloyd, for the defence, contended that the vaults extended over

the whole of the forecourt, and were buildings or structures within the meaning of the Act. Mr. Robert J. Worley, architect, gave evidence in support of that view. The foreman of the works at 50, Lincoln's Inn-fields, stated that vaults extended over the whole of the forecourt. One of them had been bricked up. Mr. Chilvers pointed out that if Mr. Lloyd's contention was correct, that buildings could be erected on the site of every vault, a most inconvenient state of things would arise. For instance, there were vaults connected with almost every house in the Strand. Many of them went under the pavement; but surely no one could argue that they would be justified in building on the pavement. Mr. Lushington adjourned the case, to enable him to consider the cases quoted.

**COMPENSATION CASE IN LOWER THAMES-STREET.**—The case of "Price v. the Commissioners of Sewers of the City of London" was heard on Friday at the Guildhall before the Recorder and a special jury. The claimants, Messrs. Price and Co., claimed £13,000 in respect of the compulsory acquisition by the Commissioners of Sewers of a portion of their premises in Lower Thames-street, required for the widening of that thoroughfare. The claimants formerly rented the premises at £1,200 a year, but in 1878 they purchased them for £34,000. The Commissioners of Sewers required a piece of land in front of the premises measuring 730ft. and a portion of the frontage of the building. As a result of the frontage being taken down, the building will have to be reconstructed and a wharf at the rear, which the claimants let, will be closed during the time of the alterations. The total claim comprised £4,336 for the land and £5,426 for rebuilding. A number of witnesses were called on both sides, and the surveyor for the Commissioners of Sewers estimated the full sum to which the claimant was entitled at £7,629. The jury awarded the claimant £3,000.

**ATTEMPT TO ENFORCE PROSPECTIVE BY-LAWS.—FULHAM VESTRY v. SOLOMON.**—In the Queen's Bench Division last week Mr. Justice and Mr. Justice Kennedy heard this appeal, in which the Vestry of Fulham had sought to make their by-laws applicable to buildings erected before the making of the by-laws, though such by-laws were prospective only. This was a special case stated by Mr. Rose, one of the magistrates of the police-courts of the Metropolis. The appellants were the Vestry of Fulham, the sanitary authority for the parish. The respondent was the owner of a house, 30, Langford-road, in Fulham parish. On March 19, 1895, the vestry laid an information that Lewis Solomon had made default in complying with the requisitions of a notice, as to the walls of a water-closet, of the Fulham Vestry, duly served on him on February 4, requiring him within 14 days from such notice to execute works on the premises of which he was owner. Section 41 (3) of the Act of 1891 provides that any person aggrieved by any notice or act of a sanitary authority under this section in relation to any water-closet may appeal to the County Council, whose decision shall be final. The water-closet was erected before the by-laws or the Act of 1891 were passed, and the regulations relating to closets in the by-laws were prospective only. The by-laws were dated June, 1893. On behalf of the appellants, it was contended that the magistrate had no jurisdiction to inquire whether the notice of the vestry was valid, and, it having been made, duly served, and not complied with, and the right of appeal not having been exercised, he was compelled to convict under section 41 (2) of the Public Health (London) Act, 1891 (54 and 55 Vict. cap. lxxvi.) On behalf of the respondent it was contended that the magistrate had jurisdiction to inquire whether the notice was valid, and in accordance with the by-law of the London County Council made pursuant to section 39 (1) of the said Act. The magistrate held that he had jurisdiction to inquire into the validity of the notice, and further, that the notice was bad, not being in accordance with section 41 (2), and that the directions in the notice, not being in accordance with the by-laws, were void under section 39 (3). He therefore dismissed the summons. Mr. Macaskie, for the vestry, contended that the magistrate had no jurisdiction to inquire into the validity of the order, and in any case the order was good. He cited "St. James's, Clerkenwell, v. Feary" to show that Mr. Solomon ought to have appealed to the County Council if he objected to the order, and, not having done so, that the magistrate was bound to enforce the order. At any rate, Mr. Solomon might have gone before the authority making the order. "Attorney-General v. Hooper" and "Hardings v. Taylor" were also cited. The Court, without calling on Mr. Shearman, who appeared for the respondent, upheld the decision of the magistrate. Mr. Justice Wright said the magistrate held that the notice of the vestry was not authorised by the by-laws. It was plain that he was right in this, because the provisions of the by-laws were prospective only, and did not apply to existing closets. It was not contended that the arrangements here were contrary to any express provisions of the Act; but it was said they would have been contrary to the provisions of the by-laws,



if the by-laws were applicable to them. The mere statement of this argument was enough to show that it was bad. The appeal must be dismissed. Mr. Justice Kennedy concurred.

**DANGEROUS STRUCTURES.**—Under the London Building Act of 1894 Messrs. Reynolds and Eason, surveyors, were summoned to the Westminster Police-court last week, as owners of a house and cottage in Marsham-street, Westminster, to answer the County Council complaint that the structures were dangerous. Mr. J. W. Godfrey, for the County Council, asked the Court for an order for speedy demolition. The defendants' representative said there was no danger, and time was wanted to get the tenants out. Mr. Dru-Drury, the district surveyor, said that the walls of the property were bulging, cracked, and liable to fall down at any time. Mr. Sheil made an order for demolition within 14 days.

**ARCHITECTS' FEES.**—On Saturday, in the Queen's Bench Division, before Mr. Justice Grantham, sitting without a jury, the case was heard of "Cousins and Jameson v. Link." This was an action by the plaintiffs, who were a firm of architects and surveyors, of Lincoln and Leicester, against Mr. J. W. Link to recover their fees for making a valuation of certain works and premises known as the Holford Engineering Works, near Birmingham. The case for the plaintiffs was that they agreed to make the valuation for the plaintiff for a fee of 70 guineas and out-of-pocket expenses. They carried out their part of the arrangement, but had not received the amount of their claim. The case for the defendant was that the plaintiffs were instructed on behalf of a syndicate to make a valuation of plant and machinery. The plaintiffs were aware of the purpose for which the valuation was wanted: but they had never carried out his instructions, nor had they even made or delivered any report or valuation, and in consequence of this other persons had to be employed. Counsel raised the further point that the plaintiffs were employed by the syndicate and not by the defendant. In the result Mr. Justice Grantham held that the plaintiffs were clearly entitled to succeed in the action, and he accordingly gave judgment for them for £84 2s., with costs.

#### CHIPS.

The Llangollen Urban Council sanctioned on Monday a scheme for improving the water supply of the town at a cost of £2,000.

New national schools for 100 infants have just been built at Colefield, Forest of Dean, and were dedicated by the Bishop of Gloucester and Bristol on Thursday in last week. The work was carried out by Mr. Edward Wilding, builder, of Coleford, at a cost of £630.

A wharf with over 800ft. of river frontage is now being made for the North Woolwich Land Company by Mr. John Weston, contractor, of Chelsea. The area of the land reclaimed from the river foreshore is about three acres. Mr. J. Lewis Thomas is the resident engineer in charge.

At the church of St. Mary's-on-Hill, near Chester, the peal of bells, restored and enlarged to eight, was re-dedicated last week by the Bishop of Chester. The recasting and refitting of the bells have been carried out by Messrs. Warner, of Cripplegate, London. Messrs. Bird and Bird, of Lower Bridge-street, Chester, have done the structural work.

The London School Board has now completed, for the sum of £22,000, the purchase of the Royal Normal College for the Blind at Upper Norwood, which will be used for carrying on the education and training of blind children after the ordinary school age.

The members of the family of the late George Oldfield, of Dringthorpe, have just caused a reredos of oak to be erected to his memory in the church of St. Edward the Confessor, Dinghouses, York. The work has been designed by Mr. C. Hodgson Fowler, F.S.A., Durham, and the carving has been carried out by Mr. G. W. Milburn, York. The central panel shows our Lord in Majesty, and in the left hand panel is a figure of St. Peter, and in that on the right one of St. Edward the Confessor. The style is Perpendicular. The ceremony of dedication took place on Friday by the Bishop of Beverley.

The monopoly enjoyed by the slate manufacturers and quarrymen of Carnarvonshire and Merionethshire, North Wales, is seriously threatened with competition from America, and much anxiety prevails in the quarry districts of Bethesda, Festiniog, and Llanberis, where some thousands of men are employed, as to the future results on the trade. It is authoritatively announced that, tempted by the present high prices of Welsh slates, a steamer is bringing over 3,500,000 slates as a first consignment. The Welsh merchants assert that the American slates are of an inferior quality, and that a previous import of 700 tons turned out unsatisfactorily owing to breakages and the softness of the material.

#### WATER SUPPLY AND SANITARY MATTERS.

**THE METROPOLITAN WATER SUPPLY.**—The London County Council considered, on Tuesday, a report drawn up by a special committee on the various Bills of the London water companies for the forthcoming Session, stating that the Bills must be regarded as a definite attempt to obtain such new statutory powers as might enable the companies for many years to escape coming under the purview of Parliament and the local authorities, while the result of the companies' obtaining such powers would be a large addition to the cost of purchase. The committee are strongly of opinion that the Bills must be opposed by the Council. After a discussion it was decided, without a division, to petition against the Bill, on the ground that the water supply should be under public control, and not in the hands of private companies. The consideration of the scheme for obtaining water from the Welsh hills was postponed till a further report shall be brought up.

**THE SALFORD SEWAGE WORKS.**—We have received a description of the scheme for completing the Salford sewage works proposed by the borough engineer, Mr. Joseph Corbett, and addressed to the River Conservancy Committee. Mr. Corbett's scheme, submitted in 1894, has been revised and submitted to many expert engineers in this country and abroad, who have generally approved of the main principles and certain details. The Conservancy committee have already carried out the suggestions for uniting the flow of sewage along the central channel, and have approved the suggestion for forming five of the six northern precipitating tanks into one long tank divided by dwarf walls, and for altering the other tanks. Contracts are on hand for the plant required in connection with the loading of the sludge steamer, which works satisfactorily in carrying the sewage out to sea. Three further structural works are required: (1) the removal of sludge from the precipitation tanks, (2) the provision of "roughing filters" for straining particles of solid matter from the tank effluent, (3) the final filtration of the clarified effluent. The average daily flow of sewage is estimated at 12,000,000 gal. As to the removal of sludge from the tanks, Mr. Corbett refers to a novel scheme, by means of a travelling scoop or pontoon and traversing gear, and pliable pipes for conveying the sludge to the new sludge-tanks, and the estimate is stated to equal 1s. 8d. per million gallons of sewage. By this apparatus, it is stated, all the precipitation tanks could be used continually, and effect a saving in chemicals. The "roughing filters" have proved very efficient for removing any visible particles of solid matter from the tank effluent. The cleansing of these filters is effected by upward flow and surface raking. The plan shows six separate filters with a mixing channel in the centre at the head of the precipitating tanks. The roughing filters is estimated to cost, with sand-washing engine, &c., £4,820, and the annual working expense at £844, or 2s. 11d. per million gallons of tank effluent. The work they do is similar to that done by the coke-breeze filters at Glasgow sewage works, and the report of the borough analyst shows a complete removal of all matter in suspension. The twelve aerating filters shown are on the principle adopted at Wakefield; these are used intermittently. The filtering materials are of cinders, sand, and coke-breeze, and a tabulated statement of experiments is given showing the essential results of different materials. Other useful information is given in the surveyor's report, which is worth the attention of all sanitary authorities. It is said the roughing filters alone, without tanks or chemicals, can remove 50 or 60 per cent of impurities of sewage, or quite as much as any ordinary precipitation process. The total cost of these alterations is estimated at £35,018, and the annual cost at £6,870, equal to 31s. 5d. per million gallons treated.

A theatrical license was granted on Monday for a new assembly-hall, which has just been built at Heckmondwike, near Dewsbury, on the premises of the local co-operative society. Mr. S. Wood was the architect.

A new post-office has just been completed at Stamford. The contractors were Messrs. Bowman and Sons, of that town, who have just taken the contract for a branch post-office to be built at Leicester.

The city council of Leeds have adopted a series of recommendations by Dr. John Hopkinson, F.R.S., for the construction of an electrical tramway from Kirkstall to Roundhay, with the Westinghouse closed conduit system in Boar-lane. The proposal is to extend the Roundhay tramway to the Canal Gardens at the park; to continue the overhead electrical traction system from the junction of the Roundhay tramway at Sheepscar along North-street and Briggate; to have a small section of the Westinghouse closed conduit laid along Boar-lane; and to continue the overhead wires along Wellington-street and Kirkstall-road to Kirkstall Abbey. The estimated cost is £37,900.

#### Our Office Table.

A MOVEMENT is on foot for the acquisition, as the site for a new park for the north-western portion of the Metropolis, of the West End Hall estate at West Hampstead, the property of the late General Sir Charles Crawford Fraser, V.C., M.P. It comprises an old mansion and about 13 acres of grounds, with an ornamental lake and some fine trees. From £40,000 to £50,000 will be required for the purchase, towards which some few generous contributions have already been promised. It is hoped to obtain the assistance of the London County Council, the City Corporation, and various local authorities in London and Middlesex. The site is in close proximity to Kilburn and Willesden, and easily accessible from parts of Marylebone, Paddington, and parts of St. Pancras.

THE authorities of Tullie House, Carlisle, at the suggestion of the Earl of Carlisle, have made a commencement towards a collection of local drawings and views, particularly of buildings that have been destroyed, or are likely to be destroyed. They have succeeded in purchasing some thirty sketches of Carlisle, and of Naworth and Rose castles, made some sixty years ago by a local artist of merit, the late Matthew Nutter. These have been added to by donations, and by purchases, thus forming, with the views of the Roman Wall given by the artist, Mr. David Mossman, some time ago, a most interesting record of the locality. The collection includes sketches by Sam Bough, F. C. Newcome, Christopher Hodgson, Mrs. Maclean, of Lazonby, the younger Nutter, J. Bushby, and other local artists, as well as the elder Nutter and Mossman.

WE regret to hear that the School of Handicraft at Essex House, Bow, cannot be any longer carried on as a public institution, owing to its failure to enlist the sympathy and support of the Technical Education Board of the County Council, although it is on the board's list of recognised educational institutions. The committee suggest that the hostility and indifference with which it has been treated is due to the connection of the school with a productive workshop (the Guild of Handicraft), and the fact that that workshop is conducted on co-operative principles. A proportion of the workshop profits and a considerable sum of money have been placed at the school's service by the Guild. The Guild of Handicraft will now take over, as a private venture, any such teaching as can be conducted henceforward on a strictly commercial basis, or, where possible, under the forms of apprenticeship. Mr. C. R. Ashbee, by whom the work of the school was initiated nearly ten years ago at Toynbee Hall, will continue to act as honorary director under the management of the governing committee.

At a meeting of the sub-committee of the Lord Provost's Committee of the Edinburgh Town Council, appointed to consider proposals made to carry out the original design of the architect of the Scott Monument, it was resolved on Friday to ask a meeting with the Cockburn Association, Professor Baldwin Brown, and Mr. Thomas Bonnar, architects, Edinburgh, all of whom had submitted written proposals on the subject. Mr. Bonnar's proposal, which comes through the Cockburn Association, is to the effect that the monument should be completed in accordance with the architect's design, by the creation of a flight of broad handsome steps and an inclosing screen of carved balustrades and coping, flanked by ornamental buttress towers, and that the railing inclosing East Princes-street Gardens from Waverley Bridge to the Mound should be removed, and the garden inclosed from the line of parapet now existing, so that the portion between the parapet and Princes-street would be at all times open. Professor Baldwin Brown puts forward a modification of the same proposal, and details the manner in which his proposals might be carried out.

A LECTURE on "English Bookbinding," illustrated by lantern slides, was given by Mr. Cyril Davenport, of the British Museum, before the Library Assistants' Association on Wednesday night. The chair was taken by Dr. Garnett, C.B. The lecturer enumerated the principal substances used for old bookbindings in this country. Leather was the material chiefly employed, but many books were bound in velvet, silk, and other fabrics. The country which most nearly approached England in the variety of its



bindings was Holland; but the Dutch bindings were generally copies from French models. From the 10th to the 14th centuries there was a strange disappearance of English decorative bindings. Early English Medieval decorative work no doubt existed; but, owing to their intrinsic value, the examples of it probably found their way into Royal possession on the confiscation of the monasteries. In the Middle Ages books in England were either very richly or very poorly bound. During the Tudor period some splendid velvet bindings were executed, and he thought it was possible that, as far as art went, they were quite as fine as the goldsmiths' work which preceded them. Laws were passed to prevent the competition of foreign bookbinders with Englishmen of the same calling; but it was probable that this department of English art gained rather than lost by the invasions of foreigners, who were men of superior taste and talent.

A SIMPLE, effective, and cheap way of preserving wood from decay is practised in Switzerland in the preparation of posts for the telegraph service. A square tank, having a capacity of some 200 gallons, is supported at a height of 20ft. or 25ft. above the ground by means of a light skeleton tower built of wood. A pipe drops from the bottom of the tank to within 30in. of the ground, where it is connected with a cluster of flexible branches, each ending with a cap having an orifice in the centre. Each cap is clamped on to the larger end of a pole in such a manner that no liquid can escape from the pipe, except by passing into the wood. The poles are arranged parallel with one another, sloping downwards, and troughs run under both ends to catch drippings. When all is ready, a solution of sulphate of copper, which has been prepared in the tank, is allowed to descend the pipe. The pressure produced by the fall is sufficient to drive the solution, gradually, of course, right through the poles from end to end. When the operation is ended, and the posts dried, the whole of the fibre of the wood remains permeated with the preserving chemical.

THE late Mr. Carlo Giuliano, of 115, Piccadilly, has bequeathed to the South Kensington Museum a collection of jewelry, consisting for the most part of gold ornaments, decorated with minute granulations of the Greek and Etruscan fashion. One of the necklaces has fifty-two amphora-shaped pendants, and is enriched with 157,580 tiny gold granules. There are also some examples of enamelled jewelry, notably two flower necklaces, further ornamented with pearls and brilliants. Messrs. C. and A. Giuliano, the sons of the late Mr. Carlo Giuliano, have added to their father's bequest a crystal case, and a small reproduction, in gilded bronze, of the statuette of Victory found at Pompeii, and now in the Museo Nazionale at Naples. These gifts and bequests are provisionally exhibited in a separate case in the South Court of the South Kensington Museum.

A COURSE of seven lectures upon "Architecture," illustrated by means of the oxy-hydrogen lantern, will be delivered in the Red Room, Streatham Town Hall, by Mr. G. A. T. Middleton, A.R.I.B.A., on Friday afternoons, at 3.30 p.m. The first of the series will be given to-day, and will be entitled "Architectural Landmarks of the World's History." The subjects of the subsequent lectures are: Feb. 7, "Egypt, the Birth-place of Architecture"; Feb. 14, "The Great Buildings of Greece and her Colonies"; Feb. 21, "Roman Architecture and its Derivatives"; Feb. 28, "English History written in Stone"—Part I., "Up to the Reformation"; March 6, "The Palaces and Chateaux of Italy and France"; and March 13, "English History written in Stone"—Part II., "Subsequent to the Reformation."

A NEW burner is in the market, which for use under certain conditions of gas pressure will no doubt find its adherents. It has a "cap" burner, to be slipped on over an existing fitting, and, of course, some well-known examples of this type of burner are in very general use. The point of difference in Messrs. Williams and Dean's invention lies in the nature of the outlet for the gas. The ordinary slit is done away with in this case, and its place is taken by a series of finely-drilled holes. It is stated by competent authorities that the result of this arrangement is to improve the conditions under which the gas is brought to the point of combustion, the effect being to largely increase the size of the flame and the amount of light emitted. Careful tests with these burners, recently made by Mr. H. Leicester Greville, the

chemist to the Commercial Gas Company, have shown that the light from an ordinary No. 1 burner, consuming 3.1c.ft. of gas per hour, was raised from 2.5 to 8.34 candles—an increase of light of no less than 233 per cent.; with a No. 2 burner, consuming 3.65c.ft. per hour, it was increased 136 per cent.; while with a No. 3 burner the illuminating power rose from 8.52 to 14.04 candles—an increase of 64 per cent. The sole license in these burners, so far as gas undertakings are concerned, has been placed in the hands of Mr. W. H. Harvey, of No. 17, Old Queen-street, Westminster, S.W.

We have just received the new illustrated catalogue of Banks' Fireproof Construction Syndicate, Ltd., which furnishes a brief description, with illustrations, of Banks' patent fireproof floors and his patent "Helical" metal lathing applied to ceilings, walls, columns, &c. Some time since we described some experiments conducted at St. Pancras Ironworks, Belleisle, York-road, for the purpose of showing what severe tests this system can withstand when applied to a small house built expressly to show the resistance of this particular method of construction invented by Mr. T. L. Banks, F.R.I.B.A. The main feature of Banks' system is the interposition of a fire-checking surface, which can be used for ceilings, walls, columns, and other construction. The "separated ceiling" can be applied to wooden joist floors of existing buildings without disturbing the old ceilings. Scaffolds and columns can be incased with helical lathing and plaster. Fireproof partitions, solid and hollow, are provided also by the syndicate, and these are from 1½ in. to 3 in. thick. Ten sections of floors showing various forms of applying the ceiling bars and wooden centres to concrete floors and to wood joist floors and beams, also to girders and columns and fireproof partitions, are of interest to architects, and the cost compares favourably with other systems.

ONE of the most remarkable products of Nevada is a species of wood known as mountain mahogany, which, when dry, is as hard as boxwood, very fine grained, of a rich red colour, and in weight very heavy. It has been used for boxes for shafting, and in some instances for slides and dies in quartz batteries. It burns with a blaze as long lasting as ordinary wood, and it is then found almost unchanged in form, converted to a charcoal that lasts about twice as long as ordinary wood, giving also an intense heat—greater than coal gives. Another notable species of wood, having extraordinary durability, is said to be the quebracho wood of Argentina. Posts that have been in the ground 150 years, in soil alternately sodden by Tropical rains and parched by intense heat, are found to be in sound condition. The wood is also described as free from attacks of insects, does not decay, and is not compressible, and weighs nearly 8lb. per cubic foot.

The Edinburgh Town Council and the North British Railway Company—the former being represented by Mr. Cooper, the borough engineer, and the latter by Sir William Arrol—have arranged terms for the construction of the new traffic bridge at Jeffrey-street during the rebuilding and widening operations of the company, the cost of the temporary measure being estimated at £26,000.

The death is announced, at the age of 79 years, of Mr. William Havard Apperley, land agent and surveyor, of Worcester. At the commencement of his career he was extensively engaged in the apportionment of tithes, and many of the principal parishes in Worcestershire and the adjoining counties were apportioned by him. His time was largely occupied during the railway mania on most of the West of England lines. He negotiated the purchase of land for the Hay and Brecon railway, and later on for the Kingston, Eardisley, and Radnor extension. Of late years he had taken as partner Mr. W. Powles Brown, who succeeds him.

The Mersey Docks Board decided on Monday to construct a new graving dock on the east side of the Canada Dock, in lieu of that previously authorised to be constructed on the site of the old 45ft. Huskisson Lock.

The Croydon Rural District Council are applying to the Local Government Board for sanction to borrow the sum of £19,200, for the purpose of providing sewerage and sewage disposal works for the contributory parishes of Beddington, Merton, Morden, Mitcham, and Wallington. It is argued on behalf of the rural council that the existing sanitary arrangements are unsatisfactory, because the sewers in the district are laid in soil which is water-logged.

## MEETINGS FOR THE ENSUING WEEK

SATURDAY (TO-MORROW).—St. Paul's Ecclesiological Society. Annual Meeting at the Chapter House, E.C. 2.30 p.m.

Edinburgh Architectural Association. Visit to Bruntsfield Board School. 2.45 p.m.

MONDAY.—Clerks of Works' Association. Annual Dinner, Holborn Restaurant. 6.30 p.m.

Society of Engineers. Inaugural Address, by Samuel H. Cox, president. 7.30 p.m.

Royal Institute of British Architects. "Wood Carving and Wood Carvers," by W. H. Romaine-Walker, W. Aumonier, and J. E. Knox. 8 p.m.

Surveyors' Institution. "An Improved Method of Settling Disputes as to Rights of Way," by R. F. Colam. 8 p.m.

TUESDAY.—Architectural Association Lyric Club. Annual Cinderella, at the King's Hall, Holborn Restaurant. 7.30 p.m.

Institution of Civil Engineers. Discussion on "Recent Developments in Gas-Engines." 8 p.m.

Society of Arts. "The Garden in Relation to the House," by F. Inigo Thomas. 8 p.m.

Glasgow Architectural Association. Essay by George Gunn. 8 p.m.

WEDNESDAY.—Royal Archaeological Institute. "Mural Paintings at Willingham Church," by C. E. Keyser, F.S.A.; and "A Cyprian Terracotta," by Talfourd Ely, F.S.A. 4 p.m.

St. Paul's Ecclesiological Society. "Foreign Incised Slabs," by the Rev. W. F. Greeny. 7.30 p.m.

Society of Arts. "The Mexican Drainage Canal," by F. H. Cheesewright, M.Inst.C.E. 8 p.m.

FRIDAY.—Architectural Association. "Technical Institutes," by Sidney H. Wells. 7.30 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

### EXAMINATION FOR MEMBERSHIP.

The Examination for Admission to Membership of the Society of Architects comes into operation on NOVEMBER 1st, 1896. The Subjects of the Examination to be held by the Society are as follows:—

Section I. ARCHITECTURE.  
Subject (a). *Architectural History*.—The general principles of the various styles and periods of Architecture; their dates, mouldings, and enrichments.

Subject (b). *Planning and Design*.—The plan and design of some building, or portion of a building, with details to a larger scale.

Section II. BUILDING (CONSTRUCTION AND MATERIALS).  
Subject (a). *Construction*.—Constructional details in all trades.

Subject (b). *Materials*.—The properties, methods of working, manufacture, and the application of materials to building works.

Section III. PRACTICE.  
Subject (a). *Specifications*.—Preparation of specifications, and the examination of Builders' accounts.

Subject (b). *Contracts*.—The conditions pertaining to a building contract; the relative positions of architect, client, and contractor; and other questions of ordinary practice.

Subject (c). *Sanitary Science*.—To include water supply and drainage, ventilation, lighting, and heating of buildings.

ALTERNATIVE EXAMINATIONS.  
The Council accepts, in lieu of the Society's own Examination, certain Examinations as partly or wholly alternative.

Full particulars of these and of the Synopsis of the Examination will be published shortly.

ELLIS MARSLAND, Hon. Sec.  
St. James's Hall, W., December, 1895.

### CHIPS.

The German Emperor has ordered that, in celebration of the bi-centenary of the foundation of the Royal Berlin Academy of Arts, an exhibition of the works of its distinguished pupils shall be opened on May 4.

H. H. La Thangue's work, "Some Poor People," has been presented by a local resident to the art gallery of Dunfermline.

In Longforgan Parish Church, N.B., on Sunday, a stained-glass window was unveiled in memory of the late Rev. Dr. Ritchie, for 52 years minister. The window is a single-light, the incident illustrated being the visit to Abraham of the angel, by whom the promise of long life was given to the patriarch.

On behalf of the Clothworkers' Company, Mr. Latham, Q.C., has unveiled the memorial window to the late Miss Frances Mary Buss, founder and first head mistress of the North London Collegiate School for Girls, which has been placed in the school-hall by the Clothworkers' Company at a cost of over £200. The window, which has been executed by Messrs. Lavers and Westlake, of Endell-street, represents, by figures of women from Biblical history, the virtues of Courage (Deborah), Wisdom (Huldah), Piety (Mary of Bethany), and Service (Phœbe).

New premises have been erected in Bristol for the Capital and Counties Bank on a site having frontages to Clare and Baldwin-streets. The building is Classic in style, and is faced with Bath stone with designs of Belgian grey granite. Mr. Milverton Drake, of Bristol, was the architect, and Mr. C. A. Hayes, also of that city, the contractor.



## Trade News.

### WAGES MOVEMENTS.

**DUNDEE.**—The objects and rules of the newly-formed Dundee and District Building Trades Federation have just been formulated. In the objects it is stipulated that the Federation shall investigate all matters of dispute between employers and workmen that may be referred to it from the various societies represented on the Federation, and endeavour by all conciliatory means to obtain a just and equitable settlement of such disputes. In case of a dispute between any society connected with the Federation and their employer or employers, the other societies shall not be requested to interfere unless non-society men are brought in to take the places of the men engaged in such disputes, or other unfair means are used to crush the society affected. In such cases the matter shall be submitted for the consideration of the federation by the representatives of the society whose members have a dispute, and they shall do their utmost to effect a satisfactory settlement, and, failing to do so, they shall take such steps as they think best in the matter. Whenever any dispute exists between an employer or employers and any society belonging to this Federation, no member or members composing the societies forming this federation shall do any work of the men on dispute. The subscription is to be a penny per quarter per member, payable in advance. Each trade affiliated may elect delegates in the following ratio:—Under 100 members, two delegates, and an additional delegate for every 100 or part thereof, up to the number of four delegates.

### CHIPS.

The summer meeting of the Royal Archaeological Society will be held this year at Canterbury. An excursion will be made to Calais under the guidance of Lord Dillon.

The new schools, Old Trafford, Manchester, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At a farewell meeting held by Dr. Wilberforce at Newcastle-on-Tyne, on Friday, prior to removal to Chichester, Earl Percy stated that since Dr. Wilberforce entered upon the bishopric of Newcastle thirteen years ago, the sum of £108,000 had been raised by the bishop's fund, out of which 11 new churches have been built and 18 new mission-rooms provided, altogether affording seating for 10,000 people, and 14 new parish buildings erected.

The works committee of the Durham County Council recommend that the contract for the erection of the new county council offices, on the site of the residence lately occupied by Dr. Barron, in Old Elvet, Durham, at an estimated cost of £22,000, be given to Mr. Rankin, of Sunderland.

The Tynemouth Corporation have raised the salary of Mr. John F. Smillie, the borough surveyor, from £250 to £350 per annum.

Another section of the Cornwall Railway is about to be doubled, that between Burgallion and Probus. The contract has been let by the Great Western Railway Company to Messrs. Relf and Sons, of Plymouth.

A new hall is about to be built in Belmont-street, Aberdeen, for the Trades Council, at a cost of £5,000. The block, 70ft. in length, will be in three flats. On the first floor will be provided committee rooms, and at the rear will be a small hall containing 250 people. The floor above is reserved for a larger hall, seated for 1,200. It will be 70ft. long and 34ft. in height. The elevation to Denburn Valley will be in the Scottish Baronial style, with a turret at each side of the gable, which will be relieved by a large window.

Two drinking fountains at Manchester, for which money was left by the late Mr. Jardine, have now been completed. The larger fountain has been put up in Oxford-street, in front of All Saints' Church; and the smaller one in Oldham-road. Both fountains were designed by Messrs. Mills and Murgatroyd; that in Oldham-road has been built by Messrs. J. H. Patteson, and that at All Saints by Messrs. Howarth Brothers, all of Manchester.

Last week the Bishop of Peterborough dedicated the tower and spire of the Early English church of All Saints, Pilton, Northamptonshire, after thorough restoration. The upper part of the spire has been found in a critical condition, settlements having caused the stonework to crack and become unsafe. About 20ft. of this has been taken down and re-built of selected Weldon stone, together with upper and lower spire-lights, care being taken to replace as much of the old stone as was found practicable. The stonework of the belfry windows and defective tracery and mullions were replaced.

A meeting of the National Society for Checking the Abuses of Public Advertising will be held at the Society of Arts, John-street, Adelphi, this (Friday) afternoon, at 4.30. Among those who are expected to take part in the proceedings are Mr. Alfred Waterhouse, R.A., the Right Hon. James Bryce, M.P., Mr. Boulnois, M.P., the Post Laureate, Mr. Crackanthorpe, Q.C., Mr. William Morris, and Mr. W. B. Richmond, R.A.

Mr. James T. Jervis, C.E., has prepared for Parliament the details of the estimated cost of constructing the proposed Bideford, Westward Ho! and Appledore Railway. The total cost is estimated at £14,957 13s. 6d. The railway will be constructed as a single line throughout its whole length of 7½ miles. It will be a light railway on a gauge of 3ft., and will commence in Bideford in the centre of the street running parallel with the Quay, at a point near Bideford Bridge. From thence the railway will run through Bideford to Westward Ho! and from thence to its termination near the national school at Appledore.

On the Feast of the Epiphany the parish church of Holy Trinity, Stockton-in-the-Forest, was re-opened by the Archbishop of York after restoration. The old nave remains, but has had new bays added to it. The original chancel was a cramped and unsightly one, and this has been replaced by a large chancel. The old west gallery was removed, and an organ chamber, baptistery, clergy and choir vestries, tower and spire added. The church is now seated throughout with pitch pine. Several stained-glass windows have been placed in the church; also a new organ and peal of four bells, together with other gifts of furniture.

The new district church of Westham, near Weymouth, which has been erected at a cost of more than £4,000, was opened by the Bishop of Salisbury. The architect of the church is Mr. G. H. Fellows Prynn, of London, and the builder is Mr. W. H. Gooding, of Exeter.

"At the Fountain" is the picture this year in Messrs. Hudson and Kearns' wall calendar. It is effective and artistic as usual.

Professor F. W. Chandler, of the Architectural Department of the Massachusetts Institute of Technology, has been appointed consulting architect to the Mayor of Boston, Mass. Under the amended charter of the city, passed last year, it is the duty of the mayor to approve all plans for municipal buildings, as well as the selection of architects for them; and the mayor has selected Professor Chandler as his professional adviser in these matters. Professor Chandler will, for the present, also supervise the building work now going on for the city school board.

The town council of St. Helen's, Lancs, have adopted plans by the borough surveyor, Mr. G. J. C. Brown, for the enlargement of the fever hospital at Peasley Cross, at an estimated cost of £5,500.

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### TENDERS.

\* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender; it adds to the value of the information.

**BATTERSEA.**—For adding a room for manual training, a chemical laboratory, and a drawing-class room, to Surrey-lane schools, Battersea Bridge-road, for the London School Board:—

Johnson and Co. ....	£4,495	0	0
Hart Bros. ....	4,346	0	0
Holloway Bros. ....	4,293	0	0
Charteris, D. ....	4,264	0	0
Downs, W. ....	4,173	0	0
Lathey Bros. ....	4,165	0	0
Nightingale, B. E. ....	4,066	0	0
Bowyer, J. and C. ....	3,993	0	0
Wallis, G. E., and Sons ....	3,968	0	0
Holliday and Greenwood ....	3,934	0	0
Marsland, J. York-street, Walworth (accepted) ....	3,915	0	0

[(a) Cost of upper standard rooms, £3,345; (b) cost of works on site, including covered playground, £436; (c) cost of extra depth of foundations, £135; total, £3,915.]

**BETHNAL GREEN, E.**—For alterations in the boys' and girls' departments of the Wolverley-street school, Bethnal Green, for the London School Board:—

Munday, G., and Sons ....	£376	0	0
Gibb, D., and Co. ....	369	0	0
Staines and Son ....	297	0	0
Martin, W. ....	279	0	0
White, T., and Son, Fairfield-road, Bow (accepted) ....	268	0	0

**BRISTOL.**—For cask-washing house, Lewin's Mead, for the Bristol United Brewery Co.:—

Perkins ... ..	£777	5	0
Walters ... ..	770	0	0
Love ... ..	760	0	0
Perrott ... ..	744	0	0
Wilkins, R., and Son ... ..	747	0	0
Hatherly and Carr ... ..	697	0	0
Wilkins and Gosling ... ..	693	0	0
Cowlin and Son ... ..	687	0	0
Easterbrook and Son (accepted) ... ..	675	0	0

**BRISTOL.**—For the completion of Redcross-street school, for the Bristol School Board:—

Cowlin and Son, Bristol (accepted) £3,977 0 0

**DULWICH, S.E.**—For the enlargement of the Dulwich Hamlet school, Turney-road, Dulwich, by 250 places, for the London School Board:—

King, W., and Son ... ..	£6,871	0	0
Pattinson, W., and Sons ... ..	5,634	0	0
Atherton and Dolman ... ..	5,563	0	0
Lathey Bros. ....	5,464	0	0
Nightingale, B. E. ....	5,436	0	0
Wallis, G. E., and Sons ... ..	5,361	0	0
Lonsley, J. and Co. ....	5,149	0	0
Bowyer, J. and C. ....	5,129	0	0
Peacock Bros. ....	5,126	0	0
Holliday and Greenwood ... ..	4,974	0	0
Patrick, J. and M., Rochester ... ..	4,700	0	0

+ Accepted.

\* This contractor protests against the form of contract.

[(a) Cost of school buildings, £3,690; (b) tar-pavement and drainage, £340; (c) one room for teachers, £100; (d) works to existing buildings, £454; (e) extra depth of foundations, £116; total, £4,700. Cost of existing school, £5,656; cost of proposed enlargement, £4,700; total, £10,356. Total accommodation of school, including proposed enlargement, 718; total cost per head of ditto, £14 8s. 3d.]

**DURHAM.**—For the erection of county council offices in Old Elvet, Durham city:—

Rankin, of Sunderland (accepted) ... £22,000 0 0

**EDINBURGH.**—For the supply of rails, slots, fish-plates, &c., required for the cabling of city tramways, for the Edinburgh town council. Messrs. Colant and Cooper, engineers:—

McLennan, P. and W., Trongate, Glasgow (accepted)  
£31,541 14s. 2d.  
[Lowest tender received.]

**HACKNEY, E.**—For the construction of an additional infirmary pavilion, for the Hackney board of guardians:—

Davenport, W. J., Clapton ... ..	£34,900	0	0
Nightingale, Albert Embankment ... ..	34,735	0	0
Symes, Stratford ... ..	34,640	0	0
Shurmer, W., Clapton ... ..	32,877	0	0
Cheesum and Son, Haggerston ... ..	32,099	0	0
Holt and Son, Arundel ... ..	31,229	0	0
Kirk and Randall ... ..	30,491	0	0
Wall and Co., Kentish Town ... ..	29,956	0	0
Thoroday and Co., Cambridge ... ..	29,852	0	0
Lamble, S. E., Kentish Town* ... ..	28,731	0	0

\* Accepted.

**HOMERTON, N.E.**—For enlarging the Hackney Divisional Offices in Homerton-terrace, for the London School Board:—

Knight, H., and Son ... ..	£1,839	0	0
Gregar, W., and Son ... ..	1,767	0	0
Dearing, C., and Son ... ..	1,705	0	0
Grover, J., and Son ... ..	1,686	0	0
Cox, C. ....	1,666	0	0
McCormick and Son ... ..	1,591	0	0
Vernall, Danes, and Co. ....	1,502	0	0
White, T., and Son ... ..	1,498	0	0
Charteris, D. ....	1,447	0	0
Shurmer, W., Upper Clapton* ... ..	1,395	0	0

\* Accepted.

[(a) Cost of enlargement of building, £1,070; (b) works on site, £245; (c) extra depth of foundations, £50; total, £1,365.]



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2144.

FRIDAY, FEBRUARY 7, 1896.

### EXASPERATING ADVERTISERS.

THE last thing which can answer the advertiser's purpose is to annoy his potential customers. Yet he had done this of late so effectually that he has banded together against himself men of all classes and all parties. Noblemen and workmen, Radicals and Tories—except Major Rasch—have shown themselves willing, for once, to forget all that divides them, and to join hand and heart in trying to abate the national nuisance for which he is responsible. A society has been formed on purpose to deal with the abuses of advertising, and a Bill, intended to lessen some of them, was not long ago brought into Parliament. New laws may do much in the matter, when they are made. But much may also be done by public authorities, even under present conditions, and most of all, probably, by an appeal to the common sense of the leading advertisers themselves.

In London we are being freed, by local action, from the danger and deformity of sky-signs. Before long we shall see no point in the reminder that—

There are signs in the sky which give comfort and hope,  
And say, "Do not languish—try somebody's soap."

We can only trust that overhead telegraph wires may be proceeded against as thoroughly and effectually as their aerial neighbours. There will be some satisfaction, then, in designing the only part of a Metropolitan building which can really be counted on to withstand smoke and dirt—namely, the part which, at all times, save in actual fog, stands in relief against the heavens above it. The general mass and outline of modern works is often the most satisfactory thing about them. They grow impressive when the frippery with which fashion overloads them has vanished, when a thin light veil of mist softens the harshness of their lines, or when "divine, everlasting night," has suffused them with the poetry which day is too apt to dissipate. Undersuch conditions the clumsiest structures and the tawdriest may alike give a suggestion of sublimity; so that the Tower Bridge no longer looks "common," nor such as that of Old Battersea unclean.

The advertiser recognises no "taboos." Nothing is sacred to him, any more than to a sapper. Fifty years ago he stencilled "Try Warren's Blacking" on the Pyramids of Egypt. But this was while he was only an Infant Hercules. He has done mightier things since then. He has attempted, with no great success, to throw his name on the clouds, and is quite ready to put it on the moon, if anybody would show him how. In the mean time, he defaces our monuments by the aid of magic-lanterns, and spoils our fairest landscapes by gigantic notice-boards. In fact, he and the cheap trippers between them, with the aid of the enterprising tradesmen who follow in their wake, as porpoises follow shoals of fish, are rapidly making all celebrated places into things to be avoided. The Land's End, in the season, does what it can to look like Chingford on a Bank Holiday. Kynance Cove decks itself out with stalls, like a bit of Yarmouth sands. You can find the way up Snowdon by greasy papers and broken glass; and you can recognise the most vaunted spots about Bettws-y-Coed by the trampling down of the grass and the breaking of the trees. So it is everywhere, and the wise traveller is learning to use his guide-book—with a difference. He carefully notes what it advises him to visit,

only that—like Mary's little lamb—he may "turn round, and go the other way." He finds a small mountain, with quietness, better than a large one with 'Arry and the pill-monger; so that these gentlemen are likely before long to have undisturbed possession of the places which, as they fancy, everybody is bound to see.

This is a nuisance especially fit to be dealt with by the society which has taken in hand the Abuses of Advertising. But there are others, trivial in comparison, which must be as harmful to the perpetrators as they are vexatious to the victims. There is no reading the magazines as they arrive, because of the advertising cards and flyleaves which are stitched or pasted in. There may be, here and there, a reader endowed with superhuman patience who carefully turns back the obstruction with the view of perusing its contents at a more convenient season. But after considerable search and inquiry we have not at present met with one. "What do you do when such advertisements are fastened in between the pages of text?" is a question we have circulated rather widely. "Tear them out and throw them into the fire," is the ordinary reply. Nobody stops to examine them, however attractive they may be. They are matter in the wrong place, to be got rid of swiftly, to be destroyed and forgotten; and the people who insert them in that place are amongst the "exasperating advertisers" we are trying to enumerate. The reader loves them none the more because the tearing out of their leaflets—without which he cannot go through his magazine or his book in comfort—involves very often the tearing of some of its pages. He risks this; but when it happens, he does not omit to score the loss against the advertiser whose awkwardness has occasioned it.

The advertiser's treatment of architects is apt to make them smile. It shows a kind of innocent self-complacency on the oppressor's part—a confiding belief that the world in general will value his wares as highly as he himself does, and will treasure up his notifications concerning them as if they were the title-deeds of an estate! Sometimes there comes by post a sheet which the vendor modestly desires you to paste into the catalogue which he sent you two or three years before. Well, there are catalogues which an architect preserves; but a small shelf, or perhaps half a shelf, will hold them all. Most that arrive go, by a more or less direct route, to the limbo of vanities; some, because their contents do not concern the person they are addressed to; others, because experience or observation has made him shy of the goods offered, and many more because, professing to be ornamental and artistic and all the rest of it, they are so flagrantly vulgar and offensive that his eyes cannot bear to rest on them. The others, perhaps, he preserves, thinking they may some day be useful. But they are generally large and cumbersome. As they reach him they are piled up one on another. After a few months they become black with dust, and when they are wanted they are either not to be found or are too filthy to touch. The tender-hearted architect's amusement is chastened by a sympathetic sadness, when he thinks how far the present state of the advertiser's catalogue differs from that in which its sender fondly imagines it to be. "Paste a flyleaf into it! Why, it was thrown away on its arrival, or it was lost amongst the multitude of its fellows, or it is somewhere near the office ceiling, too dirty to handle." And if it were not, both architects and their clerks can generally employ their time to better purpose than in keeping advertisers' catalogues up to date.

Another type of advertiser, having noticed perhaps the perils that environ books and pamphlets of large size, sends rolls. Now architects, though they may shrewdly guess, cannot be quite sure till they open it, what a

roll may contain. It may be something that personally concerns them, and it may be a drawing, or print, or photograph which they would really value. Now, the "exasperating advertiser" is fond of doing up his rolls in a sheet of paper, turned in and curled up with the inclosure, and pasted all the way along on the outside. To open a roll so fastened requires much care. The outside is so mixed up with the inside that to tear it, as one would tear an envelope, means almost certain injury to the contents, while to cut it with a knife is a tedious process, needing great caution. At last, however, it is done, and then comes out, not the drawing or the photograph, on the bare chance of finding which the recipient took all these pains, but a gigantic representation of grease-traps or siphon-traps, or "ornamental" w.c. apparatus. The advertiser, like a hundred more of his species, calmly assumes that you have a perfect Royal Academy of hanging space at your disposal, and does not doubt that the merits and beauties of his production will insure it a position "on the line." It does not strike him that his wares, however useful, are scarcely the things to feast one's eyes on all day and every day, and that, even if they were, a drawing-office, like greater institutions, may have to reject even meritorious productions for want of room.

The total amount laid out on catalogues must be enormous, and the greater part of it is utterly wasted. If advertisers spent the money instead on improving their goods and the designs for them—if, in short, they tried to deserve a reputation instead of seeking for it by mere pushing and touting—they might obtain admiration where they now only produce disgust.

The ordinary illustrated list is a mere string of horrors, which everyone of average taste loses no time in consigning to the waste basket. And even when more attractive catalogues appear, as they sometimes do, it must be a very easy-going architect who ventures to give orders on the strength of them. The best advertisement is a specimen—small, but perfect—of the actual things advertised. If it is really good, it will bring visitors who mean to buy, provided only that the bulk of the stock proves to be equal to the sample sent. Drawings and descriptions are not to be trusted, and even photographs may be made to deceive. But a real specimen does carry conviction. If it is good, the only question is whether it is a fair sample of what the sender will supply. Above all things, it should not be large or cumbersome. Drawer space is as limited as wall space; and even when something of undoubted excellence arrives, an architect may have no opportunity at the time for using it in his works. All he can then do is to put it away, and turn to it when the chance arrives. If the sample was too large and cumbersome, so that it had to be deposited on the office floor instead of being locked up in a desk or a cabinet, it will probably be undiscoverable when at last it is wanted. It has been broken, or defaced, or covered with dust in the course of time, and has then been thrown away as rubbish. This is what generally happens to sample bricks, and to those fragments of polished shafts which the marble-worker vainly fancies will be received with joy. If the bricks and the marble had been sent in neatly-squared pieces—say  $\frac{1}{2}$  in. thick, and 2 in. across—they would have been kept securely, and would have done better service than any catalogue, provided always that they had the sender's name and address on the back. Their value would be increased if the price—of course, at the date when they were issued—were marked on them also.

This matter of names and addresses, lastly, is one in which advertisers often give trouble and fail to do themselves justice. They need to get it clearly into their heads that an architect cannot at all times specify even the goods he approves of. His work varies, and



what he has no occasion for now he may be urgently in want of at some future period. Then, perhaps, though he knows very well what material or what manufacture he requires, he can no longer remember from what firm it is to be had, or where their business is carried on. They have sent him catalogues. Yes; but in the multitude of catalogues there is confusion, and to look through scores of them, soiled with the dust and dirt of years, is no light matter. He turns to the professional journal of the week, and if the address is there, though only in a line, all is well. If not, he writes to somebody else in the same line whose address he does know. We could give instances in which large orders have been lost to firms of high repute simply because, from the idea that no one could be at a loss to find them, they have neglected to put their names amongst those of less-known makers, or have failed to keep them there. Every man of business who wants the help of architects, or of contractors, should take care that his place of business is notified weekly in the journals with which contractors and architects are known to provide themselves;—there are very few of these, and it is not costly, if advertisers were wise enough to refrain from flinging their money away on the periodicals architects and builders never read—or, for the matter of that, anybody else.

#### DISAPPOINTING DESIGNS.

ACCORDING to Charles Lamb, in his "Essays of Elia," the world is made up of two classes, borrowers and lenders, and this distinction appears to be forcibly exemplified in the case of those two classes of the profession—the men who invent, and those who borrow. The painter can do exactly as he likes; he can invent or adapt those images and objects which suit him the best; but the architect is obliged to borrow or appropriate the labours and skill of a variety of other people which he has not the power of making his own. No doubt this is why the architect's work, in its more ordinary aspects, falls so infinitely short of his own expectations, and of those who can form any opinion. His design on paper is an unfulfilled vision of bricks and marble; its perspective, which so delighted the expectant public or his patron, vanishes or dwindles down to very commonplace elevations in brick and mortar, and the colour which gave a charm to the composition fades into a dull, dreary monotone.

Between a building and its conception on paper there is often a great difference, much more than appears to the ordinary lay mind, or even to the architect who is unable to detect any, owing to having left the drawings to someone else, or because he is incapable of discovering any sympathy or relation between them. Certainly we never go into a new building without asking ourselves whether it is really a true and honest interpretation of the architect's mind or intentions? In many cases we come out believing that the real architect must or ought to feel dissatisfied with his work. If he does not, he must be indifferent or callous to artistic impressions. The best of architects often experience this dissatisfaction; the late Mr. Street himself, we recollect, though a thoroughly conscientious architect, and one who did not spare either builder or workman, often expressed himself dissatisfied. The more competent and sensitive the artist is, the more is he likely to find fault with the execution of his own designs. He has in his mind's eye how it ought to be done—an ideal perhaps unattainable—and he finds something that is far below it. The workman has omitted to do something, and left the work crude and unfinished, or has done something of his own accord that is positively distasteful or incorrect. No doubt a perfect realisation of the architect's ideas is not always to

be found, simply because all the factors which are necessary to produce it are not considered by him. Only a skilled and experienced man can form an approximate forecast of what he intends, and hence the impossibility of conveying to the lay mind the excellence or beauty of any given design.

We cannot wonder, therefore, if so many of the buildings that are erected from architects' designs fall short of our expectations. From the latest block of flats for artisans to the palatial "doss" house built regardless of cost, one comes away with the feeling that they are bare, utilitarian, and unfinished looking. The exteriors are as ungainly and crude as they are colossal in dimensions. The façades look thin, hard, and uninviting, as if only the elevation had been worked to without depth or perspective meaning. One sees a flat, prodigious surface of red pressed brick relieved by gables that do not express any internal function, with poor details and string-courses. It is pierced at regular intervals by windows that might do credit in a bricklaying class at a technical school. Simplicity and breadth are good qualities, but they may become meagre and vapid when there is no depth or shadow to give value to them. Then there is often something very disappointing in the outlines and roofs of new buildings. The architect has either neglected to study some particular view of his building in perspective, or has permitted the builder to make alterations or deviations, the consequence being that what looked agreeable in the elevations in execution is positively hideous. A large sloping slate surface, or an ugly hipped end comes into sight at the side. Or the cupola or turret from which he expected so much is a failure. It is too low or squat, or bad in profile for like reasons. These and like failures meet the eye in nearly every new thoroughfare or rebuilt street in London. Is it conceivable to suppose that the designer of the new block of business premises facing St. Paul's on the south side of Ludgate-hill intended to finish his building so abruptly; or that the architect of the lofty block in Piccadilly-circus imagined that his roofs would be so unsightly as they are to everyone who scans the skyline walking up Regent-street? No. If they had thought out their designs by the aid of perspective, or how they would look from these points of view, some modification would have been made. Possibly many an unsightly feature would have been avoided, and such an eyesore as that of the Ophthalmic Hospital in St. George's-circus rendered impossible, if architects studied their elevations more in relation to the contiguity of adjoining buildings, and did not intrust them so much to draughtsmen. Vicarious designing has a great deal to answer for. The architectural "ghost" has been answerable for introducing most of the faults and crudities we find in our buildings, but the architect gets the blame. The man who wants to make a push in the profession, and to win competitions, is content to get a "ghost" or an assistant to make his designs for him. He looks at such work as mechanical, and beneath his attention. When the building is erected he cannot be surprised if the result is a failure. It is the weakness of all vicarious work. We get all that perfunctory art will do—floors, walls, and ceilings, and roofs, and all that modern invention and science has done to make the building complete in its fittings; we get all save what the architect can alone give us—thoughtful design. When we enter a brand-new building of this kind, in spite of all the labour and the fittings that modern industry can supply, which attract our attention and perhaps admiration, there is a lack of sympathy and responsiveness—a cold mechanicalness and precision that cannot touch the heart or our sense of artistic fitness. In the last new workhouse, public library, technical school, or "dossers'" palace the

same want of responsiveness is evident, the same unrealised expectations.

Hurried work and vicarious designing are two reasons for all this, but there are two or three others. A lack of mutual understanding between the architect and the workman. Each adopts his own standard of what he thinks best. The architect may be sometimes right, sometimes wrong. He is inclined to insist on his own way being carried out; the workman resents, and while he tries to comply he not unfrequently does his worst instead of his best. Can we be surprised if the work turns out bad or disappointing? In some cases an artificer knows the best way of executing work—it may be a casement which is required to keep out the rain; but the working detail supplied by the architect may show an inferior way of forming the stiles. The builder or foreman is justified in discussing the work, and the architect is his own greatest enemy in still having his own way. But there are times when the builder's or workman's advice may be dictated by other motives than what is the best or most artistic. He wants to talk the architect over to do a certain thing in a less costly or laborious manner. If he can persuade him to permit a part of the façade to be executed in brick instead of stone or terracotta, or in an inferior material, the building suffers, if not the architect; the soft, porous stone that is substituted turns dingy and dirty soon after the scaffolding is removed. Reduction in the projection or mouldings of a cornice or dressings of windows transforms at once the character of the original design—it is left meagre and thin; the blame falls on someone else, not the real artist; and as long as the responsibility can be shifted, the building suffers. The vital principle that everybody should do his own work and be responsible for it, is one that has unhappily been departed from in modern English buildings; for it is not only the contractor who has banished it, but every tradesman who takes a portion of the work under him, and who wishes to make a profit, if any is to be made. Sanitary fittings, heating apparatus, gas and electric-light fittings, fixtures for trade, are all provided on the like principle of contracting at the lowest figure to do work which the artisan has no longer the power to do by himself. Surely there is an opportunity for a better system. The Architectural Association has set a good example, by inviting working men to read papers, or give practical lectures upon various details of construction, and by this manner provoking discussion between artificers and architects, who are now strangely separated. As we have hinted, each knows something that the other does not. When a technical difficulty arises, the architect has to consult the contractor or his foreman, who, from his position, is not likely to concede any point which entails extra labour. There is no opportunity, therefore, for the architect to talk the matter over with the artificer to discuss small points of detail; the result is that a detail drawing is prepared which does not meet the requirements of the case; objections are raised, but the architect decides that it must be carried out. Any concession on his part would be held to be weakness and vacillation. How much wiser would it have been if the point could have been discussed before the detail was prepared. Discretion is always the better part of valour in these cases; but some courage and a little self-abnegation are necessary to exercise it. No architect likes to admit that his details are wrong. Such admission would, in the eyes of most people, amount to incompetency. There may be two methods of doing something—one of them is more architectural, the other the more economical and practical. Of course, the builder prefers the latter. Who is to decide which shall be followed? The architect is, under the terms of contract, the authority on these questions; might he not



be more successful in carrying his opinions home to the workman if he could give the reasons why he preferred the method indicated to any other? If he cannot, or will not trouble to do so, his decisions are regarded as harsh or unreasonable. At present the architect's decision in questions of this sort is rather arbitrary. If appealed to, he would be the last to assert that he knows the right and only way of working in all trades, and he would be ready to admit that a discussion of such matters with the operative is the only way to their mutual enlightenment.

Then there is want of detail—a very usual defect in the ordinary buildings which disappoint the critical observer. It seems sometimes that nothing beyond plans and elevations have been worked to, and that all mouldings, joinery, and the like had been left to the contractors. We see this meagreness in such things as the stair balustrade; the methods by which the soffits are finished; the awkward meeting of plastering and joiners' work; the bad and crude finishings to windows and door architraves; ill-arranged or awkwardly-mitred cornices; clumsy arrangements of fittings. A general look of harshness and uncomfortableness is apparent in the interior and its appointments. All appears to have been left to blind chance and haphazard arrangements, and an overlapping of trades. In a word, we find several distinct factors have contributed to the disappointment in the results: the want of perspective study, desire to save cost, the contract system, want of details—the natural outcome of the system of deputing to someone else the work throughout all the grades, from the architect down to the sub-contractor.

#### ESTIMATION OF ANCIENT LIGHTS.

THE amount of damages to be awarded for obstruction of light is a question to be decided by the evidence of experts. Often an exaggerated estimate of the loss of light is made by owners and occupiers of premises, the consequence of which is that the defendants obtain expert witnesses, who endeavour to prove the very opposite and to underrate the loss. One extreme produces the other extreme, so that practically the result arrived at is in most cases a fair and reasonable one. A case of this sort, where one extreme opinion was set up against another, has been just decided at the Reading Assize Courts by the referee, Mr. Ridley, to whom Mr. Justice Kekewich, of the Chancery Division, had referred the case. The action tried was as to the amount of damage to be awarded plaintiff (Mr. Waite) by the defendant (Mr. A. Newbery) for causing an obstruction to a window of a bar-parlour and kitchen windows of the Central Hotel by building a warehouse near. By the aid of models, the plaintiff's counsel stated that the extent of the obscuration was considerable, and the property was depreciated in value. By the alteration of the defendant, a wall which formerly was 7ft. high was now occupied by a building over 19ft. in height. It was shown by evidence that plans had been prepared in 1888 for alterations to the hotel, and at that time the architect had made a careful survey of the premises; the defendant's new building had diminished the light to the kitchen windows, and had made the room less convenient, while the parlour was also affected. He valued the damage at £20 per annum, one-fifth of the rent, or, at thirty years' purchase, equal to £623. This evidence was confirmed by another professional opinion. It was contended that the sky, which could be seen from each of the windows, was now blocked out. Other estimates, putting the depreciation at £20 and £23, capitalised at thirty years' purchase, were adduced in support. On the other side a very different

estimate was made. Evidence was given to show that the house was not of the value given to it, and that the loss of light had only affected its commercial value to the extent of the extra gas bill—£1 or £2 a year; another considered the commercial value was not affected. The referee took a moderate view—the plaintiff's claim was too high; but he agreed there had been a substantial interference with the light, and he assessed the damages at £150. It will be seen from these figures that the claim made for damages was much greater than could be supported, and that the sum assessed was less than a quarter of that amount. While one professional man valued the damage at as high as £720 on one side, on the other the opinion was hazarded that there was no business depreciation. After these estimates, and many like them, the ordinary individual will naturally inquire how such extreme estimates are possible. Allowing for natural exaggeration in the opposing parties, the difference appears unexplainable by any reasonable rules of calculation. We naturally ask, Ought it to be possible for two such extreme assessments to be made from given data? Of course it is possible for the surveyor engaged on the plaintiff's side to take an extreme view of the quantity of light which formerly came through a certain window, and in the absence of an accurate survey of the old premises, and the former condition of matters, it is very easy for him to accept exaggerated statements of the amount of sky blocked out. Without any record of measurement of the actual quantity of light which entered an old window before the obstruction was erected, it is quite unreasonable to expect any honest estimate of the damage done. It is impossible to make one. On these grounds only we can excuse extreme opinions. But how often can a plaintiff who claims damage for obstructed light show that such a measurement has been taken? Very seldom. The mode adopted by the profession of measuring the area of light or obscuration, and the proportion which the light area or sky area bears to the area obscured, is not always the correct one. Let us take a practical example. The window of a house is darkened by another building which has just been erected. But the Court wants to know the actual quantity of light which the raised building has obscured. This can only be approximately estimated by knowing the height of the old servient tenement which has been rebuilt or raised. But how can the plaintiff obtain this height? No survey has been made before the alterations were commenced. He is here in a dilemma unless he can, by section or evidence of the original building, find that his window formerly received light over the defendant's roof at a certain angle with the zenith; by knowing this angle he can find out how much of it is taken away by the additional story or building. Evidence of this kind is of value; but when the plaintiff cannot say how much less light he receives than formerly, he has to make a guess, or get experts to swear on his behalf that the diminution is material, while the other side makes quite as exaggerated a statement that the loss of light is immaterial. It is a pity the Courts do not always insist on some definite method of measuring the obscuration, or the actual amount of light that has been lost. As it is, a large number of cases are settled out of court by the servient owner paying a compensation because he is not in a position to prove the actual amount of obscuration his building has caused. In other cases, as in this instance, the Judge does not make a mandatory order to pull down. Several methods of measuring injury are before the profession, but the Courts of law are not inclined to accept any method which is of a very complex or mathematical kind. They incline more to accept a graphic method of ascertaining the amount of obscured light. The

methods proposed by Mr. Homersham Cox and Professor Kerr are, though based on mathematical principles, rather complicated by the use of tables of cosines, or relative values. Other and more practical methods are those which are given by Mr. Gostling, described as a method by graphic perspective, and by Professor Banister Fletcher in his recent treatise on "Light and Air." The latter plan is very simple; diagrams are made by which the loss of sky is estimated at different periods of the day, and the actual amount of total loss of sky is easily calculated from them, and the plan has the merit of readily convincing the Court.

#### HANDICRAFTS IN SUFFOLK-STREET.

By MAY MORRIS.

IN the exhibition which the Society of Lady Artists have arranged this year, the usual display of pictures is supplemented by a collection of decorative work. Here, as in any such mixed exhibition, the eye, seeking for a general impression of decoration, turns with some pleasure from the line upon line of framed grey squares—which is all that can be distinguished in a crowd of pictures—to the various specimens of craftsmanship, with their shine of copper and patches of full colour, unskilful or incomplete though the detail may be. At the Suffolk-street galleries the decorative section is modestly housed in two small rooms, and against the background of full dark green are arranged with taste and simplicity the copper plates, the wood-carvings, the embroidered hangings, the book-bindings, the jewelry, which form this collection gathered from the craftsmen of England. The successful arrangement convinces me more than ever that picture galleries are a grand mistake as a means of showing off an artist's wares. It is impossible to do justice to the decorative and intellectual qualities of the finest picture when unrelated to its surroundings, or placed cheek-by-jowl with hundreds of other square-bounded masses of colour; brain and eye grow weary and confused among so many. But this little corner, with its attempts at making the best of the plain, utilitarian aspect of modern life, is not only pleasing in its general impression, but inspires me with some hope that the amateurishness of women's work may soon become a thing of the past, giving place to a certain individuality—a certain sense of responsibility, I should say—in the production of handwork. Every artist feels this responsibility. It is a serious thing for him to give out in his work, bit by bit, his own sacred Me for the public use, and nothing but his best can ever content him. There is a gulf, bottomless and impassable, between him and the amateur who wants to make a show and get talked about. I judge, then, this collection of handicrafts, with all its mistakes and experiments, to be quite sincere and painstaking. If such praise sounds cold, consider what the two words "sincere" and "painstaking" include, and whether, for instance, sincerity is a virtue we have too much of at the present time.

On looking into the work in more detail, there is a great deal to criticise with regard to style. When considering the great historical periods of ornament, from the Classical and post-Classical down to the Rococo, the choice of any particular style for one's admiration and study may be said to be a matter of taste. This I strongly and wholly deny. There are certain canons of excellence founded on common sense, and that period of art stands highest, logically, which most nearly fulfils their conditions. Sincerity and self-belief, a dramatic power of presentation, humour, grim or light-hearted, such qualities are of more value to us than symmetry and smoothness of finish. And though



no one admires the fanciful grace of the earliest Renaissance school more than I do. I fail to find in its delicate scroll-work and strange nameless flower-growths those characteristics which betray the very brain and heart of the workman. I had almost said If we must imitate, let us forget Italian Renaissance for a while, and imitate the finest Gothic work, studying the roses and vine-leaves on their stone and woodwork, in the pages of their MSS., on the folds of their embroideries. But, after all, what would it benefit us to draw these things? We could not, with sincerity and gravity, draw in the margin of our Bibles Jonah upside down, in an unspeakably comic pair of breeches, dropping into the gaping jaws of the great fish; or St. Margaret, large-eyed and pathetic, emerging out of a neat cut in the back of a dragon. We could not mix religious beliefs with human passions and bring both side by side into our work, we who consider it "bad taste" to bring religion into daily life, and have recently damned a fine play on the most nauseously hypocritical grounds. This reproduction of historical styles is the most fatal thing for our own art; it is exemplified in this collection in the accurate copying of Italian Cinque-cento work, just as much as by the illuminations that attempt to imitate some Mediaeval work, of which more anon. Remember the history of the "Gothic Revival": some of the men who were its pioneers really loved the art—loved it, and believed in it. Yet their homage to it, under economical and intellectual conditions hopelessly dissimilar to those under which Mediaeval work was produced, took the form of burlesque imitation. The rose-gardens and vineyards, and the woods with their small beasts, that gave material to the old carvers in stone and wood, are there still: it is we who have changed. And changed so much that we think we prefer the ultra-refined ornament of 15th and 16th-century Italy, whose beautifully-balanced curves and indefinite flowers tell us nothing, to the bold free work of our real forefathers, with the fragrance of wood and field upon it, which, if we searched truthfully, answers our own heart-beats with its assertion of the pathos and beauty of life.

The examples of woodwork which set me writing on my favourite subject are wrought with much skill and pains, and show very clearly that what has its own value in the right place—an Italian palace in its sun-lit magnificence of pale marbles and rare stone—looks in sober wood a mere *tour de force*. We are not, and never have been, and never shall be, genuinely Renaissance at heart, and the admiration for the style has always been a fashion, not a conviction. I must repeat that the carving here is done with skill and care, and several of the pilasters in the early style are delicate and crisp; but, in looking carefully at the massing and the detail of the 16th-century reproductions, I marvel that anyone should think it worth while to copy these heavy, lumpy bits of ornament, or take any pleasure in doing so. The brasswork shown is without character, and frankly, refreshingly devoid of any borrowed style. I am sorry to speak of it in these terms; but the executors, in seeing the fine effect of the mere colour, will, another time, be inspired to make their ornament more interesting—more crisp and definite. Someone has designed a copper sconce adapted from the Byzantine, but shows how utterly she has missed the queer conventionality of the Byzantine craftsman by working up her peacock's feathers with elaborate little strokes, studied, I daresay, from nature. The Greek carver or metal-beater represented his peacock's tail by a series of circles and rods; that was enough for him. He was an impressionist—the mass of glittering eyes is what struck him, and he noted it with the bold simplicity which few modern designers venture upon. In the

bookbinding I find the same uncertainty in the designing, though I was charmed by a book-cover with a trailing pattern of sham-rocks. One book, chiselled in relief with a panel of the Annunciation had this fault in design—and a grievous one—that one of the faces—the angel's—is drawn much larger than that of the Virgin. The Virgin is certainly seated further off, but it is a frightful error of taste to make this difference. A glimpse of woodland in one corner is worked up with much feeling and evident pleasure. All the embossed leather work is very poor. In so easy a method of ornamenting leather much beauty is expected in the designing. Some leaves of illumination are displayed, and they bring me again to my remarks on style. The artists have erred as the brass-beater with her Byzantine peacock; they have adopted the 14th-century style of illuminated ornament without understanding it, and without taking the least pleasure in its characteristics, its peculiarities, its wonderful scribes' work. To wed these imitations of "ivy-leaf" work with abominable writing, that is formless and neither ancient nor modern, is little short of a crime. I am emphatic over this, especially as the lovely art of illuminating is one that women might excel in, if they chose. Turning to the embroideries, I am pleased to leave censure for praise. The effect of a curtain, blue upon blue, worked by Arab girls, delighted me; near by, a little round in bright silks is a mosaic of brilliant colour. A well-known society sends several pieces of excellent workmanship, though a frieze, cleverly copied from some very early Mediaeval design, was certainly not taken from "Ancient Tapestry," as the catalogue says. If I had had time I should have looked up the reference. The dear little queer figures at their various occupations are familiar to me, and are, I think, from an MS. in the British Museum. There is a fan embroidered on pale satin, with an accuracy and finish that surpasses anything I have seen of the sort. A dress-panel struck my eye, both for the design of delicate coils and for the thoughtful execution; but it was too much a study in greys to please me in colour, my taste in that respect being decidedly flamboyant. Two embroidered chairs are excellently worked, and worthy of more important designs. A piano-back in warm, rich golds with *appliqué* of cooler tones is very good; but the frequent repetition of the pattern becomes monotonous over a large surface, and must have sorely tried the patience of the worker. Variety, constant change, is what we want in embroidery. I pause in wonder before a "Painted Tapestry Panel." There is a vase of flowers, with a grey parrot contemplating it from the prompt side; we are suddenly transported back to the 1851 Exhibition by the style of this amazing work of art. I should like to have seen more jewelry. Here, too, is a craft for women, with all their passion for colour and sparkling stones. What rare and lovely work could be done, and at no huge cost, for the loveliest stones are often the least valuable, and diamonds should be altogether excluded. A case of gold filigree attracted me; a necklet and bracelets had a pretty linked chain; but the filigree flower, formless and indistinct, set me thinking of a silver wreath of Eastern work that I used to see crowning a beautiful head. Each flower had its crisp petals edged and defined with a flat band of silver, which inclosed the lighter filigree; some of the centres were delicate pistils, each with a silver pearl point, and some were globular; and these flowers, set round the abundant hair, formed a crown almost as lovely as a living wreath. Let me note a "Pilgrim Bottle" in blue ware. The flat surface is well filled with ornament, the shape being utilised and brought into the scheme, and the body of it covered with a pretty little diaper. But why a painted view, in the middle, of a church-tower, a

river, and a barge with a sail? It looks like a fit of absence of mind in the artist, so utterly out of place is it with the rest of the ornament.

I have purposely avoided naming the contributors, or specifying the work closely: this is merely an impression of the whole, and details have no place here. The committee are to be congratulated on their work: there is no evidence of the haste with which, I am told, the exhibits had to be collected and arranged. Will the "Society of Lady Artists" be some day turned into the "Society of Women Artists"? We should be weary at last of the division of the sexes into "men" and "ladies." Are not we men and women, when we have learnt to understand each other, gentlemen and gentlewomen, below the surface?

## NOTES ON DOMESTIC DRAINAGE.\*

### PRELIMINARY REMARKS.

AMONG the many important and necessary essentials required for the maintenance of health is the provision of a thorough and effective system of domestic drainage. It is only within recent years that the principles and details connected with the construction of a really sanitary system for general purposes have received that careful attention which the subject demands. Formerly, so long as the drains were out of sight, scarcely any thought was given to their fitness or condition for the proper fulfilment of their duties, until their unsanitary condition was unpleasantly revealed by the presence of sickness or disease. Even now the drains of an ordinary dwelling are frequently laid with little or no supervision, and with scarcely any thought as to the best general arrangement that could be obtained. It cannot be too strongly insisted upon that not only the general arrangement, but also all the minor details, of a drainage system shall be carried out in as perfect a manner as possible. A little extra attention or expense in the first construction will be amply repaid by the lessened risk of danger to health and inconvenience which is afterwards obtained.

As the water-carriage system of drainage is now in general use, these Notes will be confined to the consideration of that system so far as it relates to the sanitary requirements of domestic buildings.

### GENERAL PRINCIPLES.

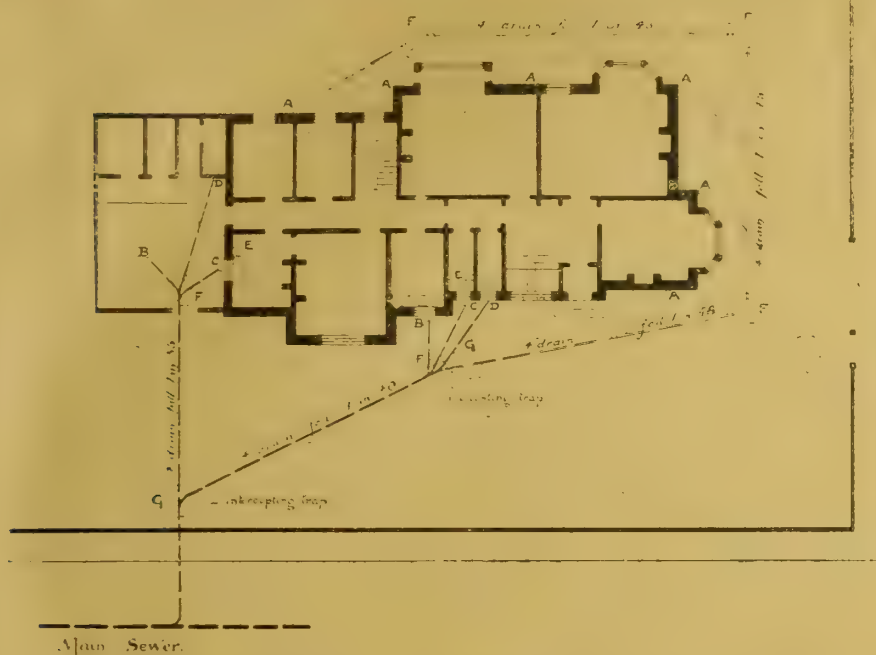
The waste liquids or matters intended to be removed under ordinary circumstances may be broadly divided into two classes—viz., sewage or foul drainage, and rain or storm-water drainage. Under the term "sewage or foul drainage" is included impure liquids of every description, together with any faecal and other refuse matters mixed with water—either in solution or suspension—that might affect the individual or general health. Storm-water drainage is confined to the conveyance of rain-water collected from roofs and other external surfaces of buildings, areas, yards, &c.

The primary object of any domestic drainage system is the safe and speedy removal of all waste matters to some convenient place where they may be collected for treatment without danger to health. For present purposes, this may be considered as having been accomplished when the waste matters have been properly delivered into the public sewer, the collection and disposal of them from that point being undertaken by the local authorities. To achieve this end, it is of the highest importance that certain general principles shall be efficiently carried out, viz.:—

1. The drainage system must be entirely disconnected from the domestic water supply. Under no circumstances should the water supply become liable to contamination either by contact with sewage itself, or by the absorption of any gases that might arise therefrom.

2. The whole of the drains and their appurtenances must, where possible, be so arranged as to be outside all buildings. This, however, can only be complied with in a modified form, as it is found necessary, for the sake of convenience, to place many of the fittings (as w.c.'s, sinks, baths, &c.) used in connection with a drainage system within the building. These fittings should be so





DRAINAGE PLAN FOR SMALL RESIDENCE.

FIG. 1.—Soil drains, — — — storm-water drains, — — — A, untrapped gully; B, trapped gully; C, grease gully; D, soil-pipe and foul air extracting pipe; E, flushing tank; F, inspection chamber; G, intercepting chamber, with ventilating manhole cover.

arranged as to be adjacent to an external wall. Housemaids' sinks, w.c.'s, &c., are also preferably placed in an annexe, with a well-ventilated lobby separating them from the main building. Where internal sanitary fittings are used, they must in every case be completely disconnected from the drains, either by an interval of external air, or by the passage of a continuous current of fresh air at its junction with the drain.

3. The domestic drainage system must be definitely cut off from the general drainage of the district, so as to prevent the passage of sewer air or foreign matters from the local sewers into the house-drains.

4. Every provision must be made for the circulation of a continuous current of fresh air through all the drains comprised within the system.

The degree of perfection in which these general principles are carried out will be the measure of the sanitary efficacy of the whole.

#### SYSTEM OF DRAINAGE.

It is a very general practice to connect surface gullies receiving storm-water only direct to foul drains. This method cannot be too strongly condemned, for in dry weather the traps of these gullies become unsealed by evaporation, and permit the escape of impure air from the drains at points where such escape may be a possible source of danger to health. Another objection to the connection of storm-water gullies direct to foul drains is that the branch drains by which they are connected have, in most cases, no current of air passing through them. Being trapped at the gully end, these branches act as reservoirs of stagnant sewer-air from the foul drains when they are not a source of danger by being unsealed in dry weather. It is, therefore, desirable that the foul and storm-water drains be grouped together, so that each may form a distinct section of the drainage system.

The foul-drainage section should convey the whole of the sewage and other impure matters, whilst the storm-water section receives only rain-water. Any storm-water areas or gullies receiving water that is liable to be fouled, such as surface gullies to areas or yards, must be connected with the foul-drainage section. Such gullies should be arranged, if practicable, to receive frequent discharges of waste water in addition to storm water, so as to prevent them becoming unsealed during dry periods.

After collecting the various foul and storm-water drains into their respective sections, the storm-water may be conveyed to an underground tank and stored for use. In places where the rain-water is not required, the storm-water section will discharge into the foul drain at some

convenient point, care being taken to provide adequate disconnection at the point of discharge by means of an intercepting chamber. The whole of the drainage, having thus been collected into one main drain, is discharged into the public sewer, but disconnected therefrom by means of another intercepting chamber. The accompanying sketch (Fig. 1) illustrates the method of grouping the foul and storm-water drains into sections.

In localities where the *separate* system has been adopted for the general drainage of the district, the two sections would be kept distinct throughout, the storm-water section discharging into the storm sewers, and the foul-drainage section into the foul-drainage sewers.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting of the Institute for the present session was held on Monday evening, the chair being occupied by Mr. F. C. Penrose, F.R.S., the President. A vote of condolence with the family and fellow Academicians of the late Lord Leighton, long an hon. Associate of the Institute and Royal Gold Medallist for 1894, was passed in silence.

#### THE ROYAL GOLD MEDALLIST.

The President announced that, under by-law 64, the council proposed to submit to the Queen as a fit recipient for the award of the Royal Gold Medal for the current year the name of Mr. Ernest George, vice-president. The nomination was received with hearty applause.

#### WOOD-CARVING AND WOOD-CARVERS.

Four papers on these subjects, illustrated by examples and drawings, were read by as many authors. Mr. W. H. ROMAINE-WALKER, A.R.I.B.A., in an introductory paper, treated the subject in its relation to the ornamentation and enrichment of construction. Wood-carving had suffered from the decline consequent on over-production. The public mind had become vitiated by vulgar and meaningless enrichment overloading so-called "art furniture," the salesmen of which were accepted by a vast majority as the oracles of public taste, and thus much of the delicacy of perception possessed by our forefathers had been lost. For a remedy for this unhappy state of things, he considered that they must look to the architect, who must take care that the carving he introduces into his work shall balance well with the parts, and suggest necessity rather than caprice. A sense of thought and fitness permeated the work of the past. Nothing in the ornamentation existed for its own sake; each

motif played its part in the general scheme; the balance of plane surface and enrichment was carefully insisted on; the relative value of light and shade ever kept in view. To achieve such work to-day, there must again be a closer bond of sympathy between architect and craftsman. A carver should be selected whose bent of mind was most in accord with the architect's, and treated, not as a tradesman, but as a brother artist. Blunders would be avoided and triumphs achieved by taking him into confidence while the drawings were still in the rough. In enriched mouldings it was desirable to have a few inches worked in soft pine, and carved before the drawing was finished; any faults could then be easily corrected. A preliminary model was absolutely essential with larger surfaces, such as panels and friezes, in order to ascertain what would be the most effective relief to give to the carving when placed in juxtaposition with its environment. The architect should express his fancy and the object he wished to develop on paper, giving every possible detail to enable the craftsman to interpret him successfully. He should, however, allow the exponent of his thoughts some liberty of action, else would he take from the executed work its soul, and leave it but a lifeless production. After discussing the position of the art during the Gothic era and the Renaissance, the spirit which actuated its exponents, and the methods of treatment at those periods, Mr. Romaine-Walker turned to the work of Grinling Gibbons, and dwelt upon its special characteristics. Gibbons's *appliqué* work, which had been criticised as meretricious, the lecturer defended for high-relief work as being much more durable, the natural disadvantages of the wood being more under control. The lecturer then considered the kind of carving applicable to the decoration of large and small rooms, described in detail the treatment and processes used on work intended to be gilt or polished, and enumerated the merits and demerits of the woods most commonly employed. In conclusion, he gave many hints as to the best methods of executing and testing the work, and some advice to young designers.

Mr. WILLIAM AUMONIER, in the second paper, considered the subject from the point of view of the craftsman. As examples worthy to be followed in the present day, he cited the original work in Chester Cathedral, that in the chapel of King's College, Cambridge, and in the choir of St. Paul's Cathedral; the carving in the choir of Amiens Cathedral, and the early work of Sant' Ambrosio, Milan, and Santa Maria in Organo, Verona. In wood-carving all the beauty should be evolved out of the material itself; it should retain the characteristics of wood, and not be made to represent marble, bronze, silver, &c. To this end the carver must be fully alive to the capabilities and susceptibilities of his material. He should combine in his work freshness and grace. The work should always be, or appear to be, carved out of a solid block. Not only the design, but the actual carving itself, should be carefully considered with a view to its ultimate position and the light it would receive. Even if close to the eye, when a certain finish was demanded, it should still show its cuts and tool-marks fearlessly, and be deepened in parts to make it tell its proper tale in the combined scheme of decoration; while if it was going a great height or distance from the eye, it should be left as rough as possible. For work to be done in a proper spirit the carver should be free, his fancy allowed to soar, his gouge some play to slip and make mistakes. The best method of working was from drawings—rough, full-size charcoal cartoons. Clay or plaster models were useless, and even immoral in their tendency. Once let them put a full-size model into a carver's hand to copy, and he sank to the level of a mere copying-machine, losing the power of concentrating his mind on his work as an art, only to retain the skill of making an accurate copy of the dead plaster he saw before him. But if they gave the carver a rough charcoal drawing to work from, he had to exert all his ingenuity to properly interpret it. Mr. Aumonier also dealt with the artistic relationship of the architect and the wood-carver.

Mr. J. E. KNOX, in a third paper, enumerated the essential requirements of the wood-carver in the way of tools, and the qualities of the woods most in use. Efforts had been made in England during the last thirty years to regain the position held by wood-carving in the 17th and 18th centuries, with a result that, in the present day, British wood-carvers were quite equal to their



ancestors in the last two centuries, and only lacked the opportunity to exercise their knowledge and skill. One of the chief drawbacks a wood-carver suffered from was the limited time allowed for the proper consideration and execution of his work. Pressure was put on him by builder or owner, and he was compelled to complete hurriedly and in a manner unworthy of his powers. Estimating was another snare—several years' practice was necessary to enable a man to estimate readily the cost of carrying out a design. Many craftsmen suffered through inconstant employment, and consequent falling off in aptitude. Some very clever carvers, doing beautiful work in one style, floundered painfully when knowledge of character or other styles was required. The young aspirant should visit the cathedrals and churches remarkable for their carvings, and study the styles and peculiarities of each. The instruction given at popular wood-carving schools was of little practical value, being of a very elementary character; pupils wasted their time there in the belief that they were learning a profitable trade, to be cruelly disillusioned when they tried to get employment. On this point the author suggested that a lasting good might be done for the present and rising generation of wood-carvers if the Royal Institute of British Architects could see their way to giving free lectures on the various styles and characteristics of wood-carving to members of the craft. Lantern views of photographs of the best examples at different periods, with explanations of each style and its peculiarities, would be of the greatest advantage. Such lectures should be printed and given at every architectural society in the kingdom, and repeated every session.

Mr. W. S. FRITH, in the concluding paper, comparing wood, which had always been a sculptor's material, with the other materials more usually employed in sculpture, remarked that its texture and warmth were qualities so agreeable that it was pre-eminently the material above all others suited for architectural furniture. It was essentially the material for the display of imagination and fancy; groups or ornaments inappropriate to stone or marble were quite fitting in wood. It was remarkable, considering the large sums spent on upholstered furniture, that there was so little demand for choice wood-carving beyond the foliage order. Doubtless it was because wood sculpture could not be conveniently produced from the clay model. Few wood-carvers received a sculptor's training, and in the treatment of the human figure in wood correct knowledge of form must go with knowledge of the material in which it is to be represented.

On the motion of Mr. HUGH STANNUS, seconded by Mr. BANISTER FLETCHER, a vote of thanks was passed to the readers of the several papers.

#### A SUGGESTION FOR DEALING WITH DISPUTES AS TO RIGHTS OF WAY.

A PAPER on the above subject, which must be of general interest to all owners of property, and which nearly touches that tender point "the rights of the public," was read on Monday evening last before the ordinary general meeting of the Surveyors' Institution by Mr. R. F. COLAM, barrister-at-law. The author said he felt that no apology was necessary for bringing the question before the Institution, for all professional surveyors must at one time or another in their practice have experienced the trouble and difficulty which arose when the question came to be determined whether some way was or was not a public way or highway. It has been said by Baron Martin that whenever he saw a notice that trespassers would be prosecuted, he always felt inclined to trespass as a protest against the illegality of the notice. But it must be admitted that the apparent churlishness of the landowner was often inevitable under the existing law. He was simply bound to be churlish or abandon his way altogether. Although the law required that the owner should at some time have dedicated the way to the public before it became a highway, it still regarded the owner's connivance as evidence of his intention to dedicate. If there were some simple procedure by which it could be adjudged that the way was not a public way, but was only so used by the owner's grace, and if that fact could be put officially upon record, there would be little need for the owner to refuse such temporary user. In such a way many beautiful walks could be thrown open to the public which now the owner fears to have used in anticipation of a future

claim of right of way. A surveyor could scarcely overlook the importance of the fact that it was not always safe to lay out a building estate regardless of an alleged public right of way running across it. It was often the case that the building owner had the choice only of either carrying out his scheme with the prospect of litigation and probable disturbance of his contracts, or, on the other hand, of letting his land lie idle. There was practically no method by which he could get the matter finally and conclusively settled against the whole world, for the only form of proceeding by which the public will be bound is a criminal indictment found against the owner. He could not compel anybody to indict him. He could put up fences and wait for the public to pull them down, and so *ad infinitum*, or until one of the parties was tired, but this did not settle the law. He could bring an action for trespass, but that was expensive and tedious, and would not bind the public at large. It was clear, said the author, that some new means was needed of settling, not so much disputes as to rights of way, but the existence of these rights themselves. People were naturally unwilling to take action even in a clear case of obstruction. What was everybody's business was nobody's business, especially when trouble and expense were involved. By the common law of England, all contracts, actions, &c., only bind those who are parties to them. If the public were to be bound,

all particulars of the acts of dedication or user on which they relied, and the owner should deliver to the public particulars of his acts of ownership. The costs of both sides might, he was inclined to think, be paid out of the funds for the maintenance of the highways. It was true that arbitration was now possible; but it did not bind the public, which was the necessary condition for the permanent settlement of such disputes. If such a mode of trial could only be well established, it would, he believed, be found that a great number of cases would be decided which were only a matter of doubt, and that it would be a great boon to owners and to the public. It could be brought into action by a very simple Act of Parliament, for the procedure of the Arbitration Act could be adopted.

A discussion followed, in which Mr. G. M. Freeman, Q.C., Mr. J. R. Adams, Mr. J. W. Willis Bund, Mr. A. Vernon, and Mr. W. H. Warner took part. The speakers were unanimously in favour of Mr. Colam's suggestions; and a very hearty vote of thanks to him for his paper brought the proceedings to a close.

#### SKETCHBOOK PEEPS IN PEMBROKE-SHIRE.

PEMBROKESHIRE, rich in the relics of a bygone age, is by no means so familiar as many other shires through which peregrinations



it could only be by bill of indictment found at the Assizes or Quarter Sessions. This took the form of a prosecution for a public nuisance, for which a fine or imprisonment could be inflicted. If the case were left at the Quarter Sessions, it would come before a common jury of the district, who might have a feeling, one way or another, on the point. There were none of the advantages of a civil trial, for the defendant could get none of the particulars nor have access to any of the documents on which the prosecution relied, and if he succeeded could recover no costs. These and other evils attached, the author said, to the system of making such an action a criminal action, although to mitigate them a defendant who could afford it generally moved for *certiorari* to bring the case before the High Court and a special jury. But for all these evils Mr. Colam had a remedy to suggest. Why should it not be possible to decide a dispute about a right of way in the same manner as any other dispute? It might be argued that the remedy was to be found in a form of action at law, in which the Attorney-General should represent the public, and the decision should be binding on the public; but taking all the facts and difficulties of the case into consideration, Mr. Colam thought that justice in such cases would be most surely met by a system of arbitration. The landowners might appoint one surveyor as arbitrator, and the representative of the public another. The two could appoint, as a third, some lawyer, perhaps chosen from a list drawn up by the Lord Chancellor—the lawyer to act as president of the court, and to decide all questions of evidence and procedure, but to have only an equal voice with the other two in the decision. The court might order that the public should deliver to the owner

are perhaps more frequently made, though few counties can boast of finer ruins or remains than those of Pembroke, Manorbere, and Carew. The cromlechs and circles on the uplands of the Precelly Hills serve to recall the distant past, while the glory of more recent days finds an echo in such remnants of Mediaeval magnificence as Bishop Gower's Palace at St. David's, or in a minor key by the ruins of St. Mary's Priory at Tenby. Mr. H. Thornhill Timmins has done well, therefore, in completing his archaeological investigation of the Shire of Pembroke, thereby compiling a companion volume to his "Nooks and Corners of Herefordshire," which we reviewed a year or so since in these pages. The book before us is uniform in style, and appears under the title of "Nooks and Corners of Pembrokeshire," with considerably more than a hundred illustrations of varied size and importance, including some maps of more than a passing interest. The author's style is both popular and replete with information of a descriptive kind, thus relieving his itinerary of that heavy manner so common to the perhaps more learned survey or the topographical handbook. Thus at the outset we start with our outlook directed "far away beyond the many folding hills of Brecon and Glamorgan, whose hollow 'cwms' are seamed with smoke from many a pit and furnace, far away beyond the broad uplands and fertile straths, where Fowey and Teivy seek the sea, the ancient shire of Pembrokeshire thrusts forth, against the western main, its bold and rugged coast-line. From Stumblehead to Caldey, the grim primeval rocks that guard these storm-

\* Nooks and Corners of Pembrokeshire. By H. THORNHILL TIMMINS, F.R.G.S. London: Elliot Stock, Paternoster-row, E.C.

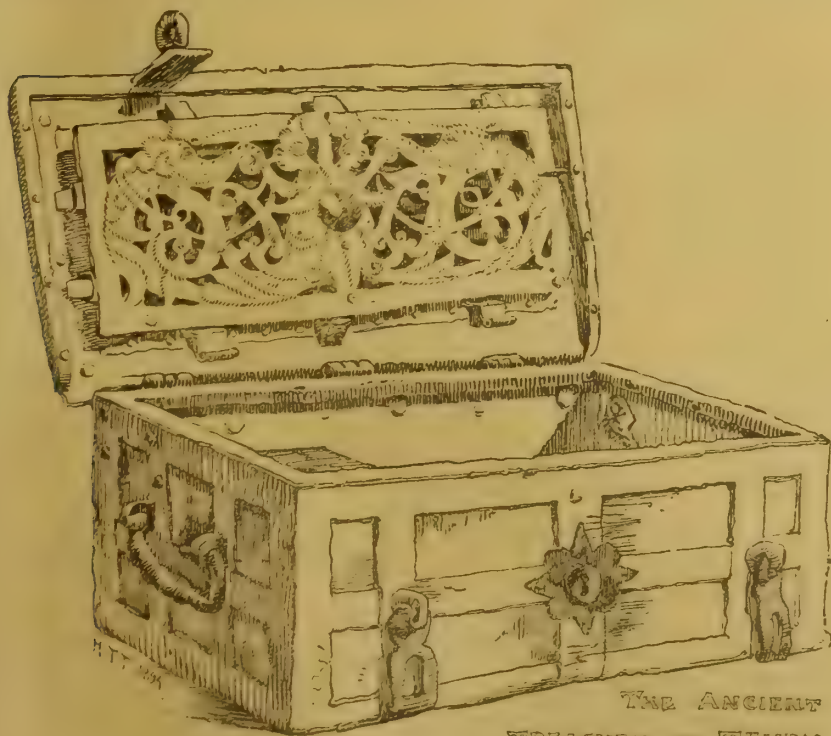




The Chancel of  
St. Mary's Church  
Tenby

beaten shores, bear the full brunt of the Atlantic gales upon their craggy bastions, which, under the ceaseless influence of time and tempest, have assumed endless varieties of wild fantastic outline and rich harmonious colouring. A weather-beaten land is this, where every tree and hedge-row tells, in horizontal leeward sweep, of the prevalent "sou'-wester." The native style of building adopted by the makers of history in this seaboard land is well exhibited in the rugged simplicity of its ancient parish churches, stern and sombre as they are, well in keeping with the landscape. Of florid architecture there is none, and such beauty as these old buildings possess comes of severe quaintness and the picturesque grouping of the most elementary forms. Some examples of pure grace and style may be named as the 13th-century arcade in the nave of St. Mary's, at Haverford-West, an unusually ornate specimen for this locality, and only excelled by

containing the remains of the Whites, who once were big folks and merchants at Tenby. The worthy Thomas White, who lies here, enabled Henry, Earl of Richmond, to escape after the battle of Tewkesbury, by concealing him in his house hard by. The curious old chest, which figures next, formed the ancient treasury of Tenby. It is enriched with 16th-century German ironwork of grotesque character, the design showing ladies tugging away at the elephantine "noses" which terminate the foliations. The box has seven bolts and padlocks. The keys were kept by two town bailiffs, while the mayor held custody of the key for the tiller inside. Turning now to our following drawing, chosen by reason of its typical character, we approach the venerable slim grey tower of Manorbere Church, perched high aloft upon a bleak hillside in lonely isolation. Originally, no doubt, of cruciform plan, the church has been added to at various times in a most capricious



THE ANCIENT  
TREASURY OF TENBY.

the Cathedral of St. David's itself. We give one of the author's sketches from this "faire l'archoe Chirche," unrivalled in the beauty and interest of its monuments. St. Anne's Chapel, shown in the accompanying view, contains the foremost of these memorials, the twin marble tombs under the archway on the south of the sacarium, and

fashion—a delightful jumble of the quaintest variety. Some notion of this is realised by the interior sketch already mentioned, with the short tunnel-like transept arched over by the curious ribs to the walls, round which a passage-way to the tower is obtained, giving access to the roof-loft. The chancel screen is modern, put up some

25 years ago, when an attempt was made to stay the onslaughts of ruin and decay. The next representative church interior chosen for remark is that of Johnston, a small village on the line a short distance south of Haverford-West. The little church, with its steeple, stands midst a few cottages at the corner of the lanes. The church, small as it is, has shallow projecting bays or chapels, after the manner of double transepts. Between them rises the chancel arch, devoid of feature save a couple of small square-headed openings, one on either side, and inclosing two small pointed arches. The old box pews, two-decker pulpit, and benches give an ancient-world look to the place, which, to the artist at least, is charming. Passing, for lack of time now to notice more, we note Walton West Church and Walwin's Castle; Little Haven and St. Bride's Hill, where Lord Kensington's mansion overlooks the well-kept church which gives the hall its name; Dale and Roch Castles, and then St. David's.

The charming old hall and staircase, which Mr. Timmins has so well figured for us, is situated in an old house in one of the most ancient parts of the town of Haverford-West, at the foot of the steep High-street there. The low-browed entry opening upon the footpath is guarded by a massive nail-studded door, furnished with a lion-head knocker and enframed by liberally moulded jambs. Passing beneath this quaint old portal, the visitor is admitted to the beautified interior shown by this sketch. The stairway leads to nicely-panelled chambers, whose fireplaces retain their original blue Dutch tiles representing scenes from the Bible.

Thus have we briefly indicated how well justified our opening remarks really are, and when we commend this volume to the lovers of old world ways and buildings, the pleasure is a mutual one; for those who know the scenes here so well illustrated and described, meet again old friends, while those who have yet to visit Pembrokeshire for the first time will do so in confidence that there are not a few charming places to visit and odd things to see in the "nooks and corners" of the county. Mr. Elliot Stock has thus added to the list of good works recorded under his name as a reliable publisher of both useful as well as artistic volumes.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XV.

By JOSEPH HORNER.

CAST IRON is used not only for the gas and water mains instanced in the last article, but also in a lesser degree for the smaller soil-pipes and drain-pipes of dwelling-houses and public buildings. It is not regarded with so great favour for these purposes as the earthenware pipes. The reason is mainly that the latter have so long had a monopoly of use, while the former are comparatively new and untried. Another reason is because the rough-cored interior of a cast pipe tends to interfere with the free passage of the drainage, whereas the glazed earthenware pipes are perfectly smooth. Cast-iron pipes are, however, made equally smooth by coating them with a solution—as that of Dr. Angus Smith—or by a special enamel. Then there is the greater cost of iron over that of earthenware. But, apart from this, iron is superior to earthenware on the score of strength, being less liable to fracture by reason of imperfect bedding or by concussion. The adaptability of cast-iron pipes depends very much upon the care taken in their manufacture. All keen angles must be avoided. This necessitates the use of special patterns and core-boxes, the cost of which can only be borne by a large volume of trade. In bend and branch pipes of this type the patterns themselves form the core-boxes, the interior being hollowed to the same shapes and dimensions as the cores. Then there is none of that moulder's jointing done, which generally leaves fins and angles in the casting. In straight pipes the cores are made in hinged boxes, so that no lapping of joints occurs. More than this, all cores of this class are made in green sand, i.e., not struck up in loam, and they are, therefore, much smoother than loam cores can be made. It is only by such devices that soil and drain-pipes can be cast so smoothly and so thin. The same remark applies to all rain-water piping and shooting. The iron used is also about the softest procurable, so that it combines a moderate degree of strength with the minimum of brittleness. Soil-pipes are made in dimensions from 2in. to 9in. bore. Up to 6in.



the metal is only  $\frac{3}{8}$  in. and  $\frac{1}{2}$  in. thick. All conceivable forms are cast. Bends or elbows of  $\frac{1}{4}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$ ths of a circle; elbows with faucet and spigot cast at right angles, or at acute and obtuse angles, and of different relative lengths; elbows with branches variously situated, or with foot-rests, or with doors for inspection, on front, or on right or left-hand sides. Then there are single-branch pipes with branches at right angles, at acute angles, at obtuse angles, with or without doors. Double-branch pipes also have branches at right, acute, or obtuse angles. Each of these can be had with branches of different bores from that of the main pipe, so that pipes of

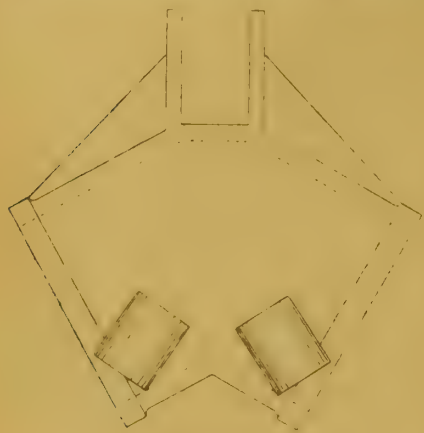


Fig. 61.

different sizes can be stemmed in to make a connection with the main pipe. Reducing branch-pipes with diminishing bores in the main pipe, for coupling up two pipes of different bores, are obtainable in a wide range of sizes. Siphon bends, and traps of diverse forms and dimensions, with and without branches, and covers and gratings are made in cast iron. So also are inspection pipes, being special lengths with openings, and covers secured with bridges and screws. Socket and spigot connections are employed for drain and soil-pipes, as in earthenware. Special forms of socketed joint are used besides the common one, such as flush joints on two sides of square pipes for corners, flush joints on three sides for insertion in a chase. All the wants of the builder are thus provided for.

Cast iron is suitable for the various connections belonging to soil and drain-pipes. Sink traps are made both square and round, with loose and with hinged covers. Gratings, round and square, and in various patterns. Frames and covers of cast iron for drains, sewers, openings, and fire-cocks are cast in a great variety of dimensions and forms, ranging from 6 in. or 8 in. in diameter for domestic use, to those of larger dimensions for use

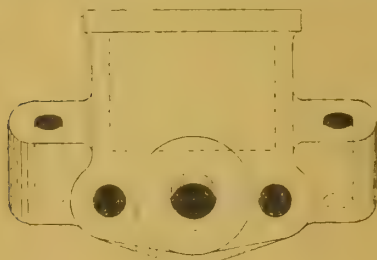


Fig. 62.

in streets. Sewer flaps, frames, and gratings, hydrant frames and covers, man-holes for sewers, with or without wood-blocking, flushing doors, penstocks, sluice-valves, and cocks also.

Cast iron holds the monopoly of pipes and connections for heating by hot water. There is as much variety in these as in the drain-pipes, including straight pipes, single bends, both curved and angled, double curved bends, siphons, tee-pieces, valve casings, junction boxes, branch pipes, and also coil-stands, coil-cases, pipe-stands, and brackets, and various boiler connections.

Cast iron affords scope for an infinite variety of design and shape in the lighter pipes used on buildings for rain-water, smoke, and ventilation. Iron has practically supplanted lead for these

purposes, and to good effect from the architectural point of view. The only advantages possessed by lead pipes were their freedom from corrosion, and the facility with which they could be bent to any required outlines. But the corrosion of iron pipes does not become serious until after a long period, and then they are so cheap that they can be readily replaced. The second, that of facility for being bent, is scarcely of moment, because the pipe-makers provide elbows, offsets, and branches of all dimensions, angles, &c., that are likely to be required. Cast-iron pipe, however, possesses this very great superiority over lead pipe, that it is cast to harmonise well with every style of architecture. Pipes may be had fluted, twisted, panelled, foliated, &c., and in sections round, square, rectangular, and half-round. Ornamental heads of every conceivable type are also cast, Gothic, castellated heads with gargoyles and griffins, and Classic heads.

The employment of cast iron has been favourable to the multiplication of public sanitary conveniences in cities, and places of public resort, whether for business or pleasure. Cast iron being non-porous, is cleanly, does not absorb offensive matters, while the lightness of the structures, and their ornamental perforations allow abundant access of air; they are equally adapted for use in factories and schools.

Cast iron is not employed for roofing girders or principals. But for shoes, both for timber and for wrought-iron roofs, it is eminently suited. Figs. 61, 62 illustrate two shoes for timber, and Fig. 63 one for iron, selected from numerous forms. These are articles which could not be made in these forms cheaply in any other material. The various parts are mainly in compression. The bosses for the truss-rods are in tension; but great length is given to these when they stand beyond the faces of the casting. In some cases the holes for the rods pass right through the body of the casting. In each case the holes for the rods and the recesses for the principals are formed by coring, so that the patterns bear only a partial

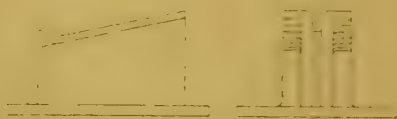


Fig. 63.

resemblance to the castings. Though cast iron is not used for the principals of roofs, yet it is employed to a considerable extent for the enrichment and ornamentation of existing roofs. For this and kindred purposes it possesses a wide range of adaptability; but this belongs properly to that section of the subject which deals with cast iron as applied to ornamentation.

Cast iron is the only material which is suitable for gratings, whether used for surface water, or for platforms, or footways, or for warming buildings. They are better and cheaper when made in cast iron than in any other material if tastefulness of execution is a consideration. The smith is restricted mainly to the riveting of straight bars within a frame. If money is no object, curves can be substituted, as in the old grills. But the curves adapted for grills are not adapted for flooring plates, because of the necessity for uniting them at the points of contact with bonds. In cast iron, however, the straight-bar and the diagonal-bar designs are now in a minority by comparison with those in which combinations of curves occur. Neither is there any difficulty with awkward shapes, since not only rectangular, but circular, semicircular, and triangular forms are obtainable. Strength is of little moment in these castings, excepting those which are used for flooring. In floor gratings there is less of curve, and more of forms which embody diagonal lines. When curves are used, they are brought closer together, and are of sufficiently stout and strong section. Gratings of this kind have to be so designed that they shall not become weakened by unequal shrinkage stresses—and that is not the least difficult part of the work, often involving much preliminary cost in experimenting before finally deciding on the adoption of a particular design.

Cast iron is a convenient and cheap material to employ for the numerous designs and shapes of standards which carry benches, tables, garden and park seats, desks, &c., for schools, public gardens, and institutions, offices, and conservatories. It is lighter than wood or masonry, and

more pleasing outlines can be imparted to these light castings than would be practicable in any other material. Cast-iron baths are made for use in situations where they can remain fixed in one position, as in bathrooms in private houses and public bathing institutions. There are no seams to become rusty and leaky. Ornament is added in such a way that the appearance is that of carved solid masonry, enamel being laid on to resemble any of the costly marbles, or serpentine, or porphyry. Cast iron is used extensively for common lift and force pumps for garden and conservatory use.

Furnace fronts and grate bars are seldom made in any other material than cast iron. They stand the heat better than wrought iron, and are much cheaper. A good deal of work in connection with stable fittings is made in cast iron, as posts, rails, panels, mangers, hay-racks, drains, various fittings, &c. There can be no objection to the employment of cast iron in window sashes for workshops, warehouses, and large buildings generally. They are not subject to decay, and if properly designed they do not break. They can be cast in forms which would be almost impossible of strong construction in timber. Various curves, circles, diamonds, and even tracery, can be embodied in these. Cupola lights and arched roofs for conservatories are cast, while the smallness of the divisions permits of level seatings for flat glass.

### CHIPS.

Not for a long time has there been the prospect of so many public works going on in the county of Caithness as at present. In the course of a few months seven new pieces of road, estimated to cost £3,026, will be in hand, and of the harbours or piers for which Government grants have been got, that at Stroms is the only one yet finished. The others to be gone on with are Dunbeath, Latheron-wheel, Auchingil, Freswick, Duncansby, and Dwarick Head.

Colonel W. Langton Coke, M.Inst.C.E., one of the Local Government Board inspectors, held an inquiry at Wrexham on Friday as to an application of the Wrexham Town Council to borrow £500 for the erection of stables and sheds, £500 for under drainage at the Borough Sewage Farm, £1,500 for street improvements, and £507 for the extension of the town sewers.

The estimate of the cost of constructing the proposed Watford, Edgware, and London Railway has been deposited by the engineers with the Private Bill authorities. The railway and all subsidiary works are to be completed for £188,292, of which £21,000 will be expended upon stations. The land required will cost £27,650. The total length of the line will be  $7\frac{1}{2}$  miles, and, although terminating at Hendon by a junction with the Midland Railway, it is proposed to obtain running powers into the stations at St. Pancras, King's-cross, Moorgate-street, and Finsbury Park.

The Aberdeen Harbour Board adopted a report and plans by Mr. Nichol, harbour engineer, for a large scheme of widening Regent Quay east of Regent Bridge. The new quay will provide 699ft. of berthing accommodation for shipping, with a depth of 28ft. at high water of ordinary spring tides, and a total width of 125ft. between the foot-pavement and the edge of the cope. On the quay two goods sheds of a width of 50ft. will be accommodated, and three lines of rails, leaving 42ft. of roadway for ordinary traffic. The goods sheds will be 250ft. and 150ft. respectively in length. The cost of the works is estimated at £36,000.

Mr. Baldwin Latham, C.E., in his Parliamentary report on the estimated cost of the new waterworks proposed to be constructed under the powers contained in the deposited Bill of the Urban District Council of Malvern Link, names £35,000 as the probable outlay.

Mr. Leigh Hancock, brick manufacturer, Hawarden, has been appointed a magistrate for the county of Flint.

Owing to the large number of buildings in Paisley used as loom shops, and now, owing to the decay of hand-loom weaving, sought to be converted into dwelling-houses, a difficulty presented itself to the Dean of Guild Court, when they found that the ceilings of these premises averaged about 9ft., and the Police Act laid it down that the height should be 9ft. 6in. Mr. Scott Dickson, advocate, was consulted by the Paisley Police Commissioners as to whether they had any discretion in the matter, and he has given the opinion that the rule laid down in the Act is absolute.

There is no truth in the report that Lord Leighton of Stretton has bequeathed his house in Kensington to future presidents of the Royal Academy. The contents of the house in Holland Park-road will be sold almost immediately.



CONTENTS.

Exasperating Advertisers .....	193
Disappointing Designs .....	194
Estimation of Ancient Lights .....	195
Handicrafts in Suffolk-street .....	195
Notes on Domestic Drainage .....	196
Royal Institute of British Architects .....	197
A Suggestion for Dealing with Disputes as to Rights of Way .....	198
Sketchbook Peeps in Pembrokeshire .....	193
Cast Iron in Builder's and Contractor's Work.—XV. .....	199
The Building News Directory .....	XIII.
Our Illustrations .....	201
Building Intelligence .....	220
Engineering Notes .....	220
Architectural and Archaeological Societies .....	220
The Timbers of Australasia.—II. .....	221
Mistakes in the Building Trade .....	221
Graphical Determination of the Stresses in the Members of a Collar-Beam Roof-Truss.—III. .....	222
National Association of Master Builders .....	222
The Building Contract of the London County Council .....	223
Obituary .....	223
Competitions .....	223
Correspondence .....	224
Intercommunication .....	224
Legal .....	224
Legal Intelligence .....	225
Water Supply and Sanitary Matters .....	226
Our Office Table .....	226
Meetings for the Ensuing Week .....	227
Trade News .....	227
Tenders .....	228

ILLUSTRATIONS.

THE BUILDINGS OF THE APOTHECARIES' COMPANY.—NEW PREMISES AT BUENOS AYRES.—CHARTRES CATHEDRAL.—HOUSE AT ROEHAMPTON.—NO. XXXVII, FIRST AVENUE, BRIGHTON.—SKETCHBOOK PEEPS IN PEMBROKESHIRE.—EAST RIDING LUNATIC ASYLUM, BEVERLEY.

Our Illustrations.

LONDON CITY GUILDS: NO. XVI.—THE BUILDINGS OF THE APOTHECARIES' COMPANY.

We shall illustrate the fine old hall of this ancient guild at an early date. To-day we give views of the library and court room. Those who wish for a concise résumé of the history of the building would do well to consult "The Apothecary (Ancient and Modern) of the Society, London,

argued, in which Shakespeare places his first scene, Act 3—an imposing-looking building with many turrets, abutting on the Thames by a broad terrace. Hard by is Play House-yard, where the beauty and fashion of the day attended the Playhouse of Blackfriars, to hear the plays of Shakespeare, Ben Jonson, Beaumont, and Fletcher, and where Shakespeare himself acted. Next to Play House-yard, is Printing House-square, now celebrated as the *Times* printing office. It used to be the large printing house where proclamations, Bibles, and Prayer-books were issued. In Castle-street stood Castle Baynard. It was held by a follower of Norman William, and thus became ultimately the property of the Clares, and afterwards of Fitzwalter, one of the barons who signed Magna Charta, and the owner of the land and property yielded to the Grocers' Company in 1428 for the erection of their hall, thus establishing a remote connection between this ancient trading body and the Apothecaries' Society. The land on which the hall stands is merely part of a much larger piece of land. The charter contained a power for the society to acquire a hall, a house and grounds known as Cobham House in 1633, belonging to Lady Howard of Effingham. On that piece of ground stands not only the hall, but all the adjacent buildings which are connected with the hall, as far as those buildings are the property of the society. The premises originally extended to the river, hence the title "Water Lane," in which the hall is situated.

NEW BUILDINGS, BUENOS AYRES.

THESE buildings are now in course of erection for the River Plate Trust, Loan, and Agency Co., from the designs of the architect, Mr. George Lethbridge, A.R.I.B.A., of 7, Drapers'-gardens, Throgmorton-avenue, London. The buildings contain shops on the ground floor, and offices on first and second floors, the third and fourth floors being arranged for private residences. The principal staircase is constructed of granite, and the staircase to the Trust Co.'s own offices on the first floor, of marble. A passenger lift is to be fired from basement to third floor. The floors throughout are constructed with iron and steel joists and brick arches, and the roof, which is

CHARTRES CATHEDRAL.

WE give a view across the nave of this cathedral, drawn by Mr. C. E. Mallows.

RESIDENCE, ROEHAMPTON, SURREY.

THIS residence was erected for the late Mr. James Hall Renton, from the designs and under the superintendence of the architect, Mr. George Lethbridge, A.R.I.B.A., of 7, Drapers'-gardens, Throgmorton-avenue, London. The house is faced with red brick, and every attention has been given to internal comfort and convenience. The work was executed by the builders, Messrs Lucas Bros., of Belvedere-road, Lambeth.

ALTERATIONS TO XXXVII, FIRST AVENUE, BRIGHTON.

THESE alterations have been recently carried out for Mr. W. B. Chamberlin, with the view of enlarging the vestibule, and of giving some character and interest to an otherwise ordinary hall and staircase. The vestibule has a black and white marble pavement, with a green and red marble pattern in the centre. The panelling and screen are entirely of deal, painted and enamelled a rich green colour. The floor of the inner hall is laid in oak; while the staircase, balustrade, &c., are constructed of mahogany. The deal panelling of inner hall is painted an old-fashioned cream colour, which contrasts very well with the rich mahogany doors to the public rooms. Messrs. D'Oyley and Co., late of Oxford-street, W., were the contractors, and Mr. A. N. Prentice, A.R.I.B.A., Hastings House, Norfolk-street, was the architect.

SKETCHBOOK PEEPS IN PEMBROKESHIRE.

(SEE article and other illustrations on p. 198.)

EXTENSIONS TO THE EAST RIDING LUNATIC ASYLUM, BEVERLEY.

WE illustrate to-day the first premiated design for these extensions, modified as proposed to be carried out. The building is three stories high, and provides day space for 121, and dormitory accommodation for 101 patients and 11 nurses on the women's side of the asylum. The ground floor is occupied by dining-room, day rooms, nurses' rooms, seven single rooms, dormitory for special cases, and lavatory and other necessary accommodation. The first floor is similar in plan



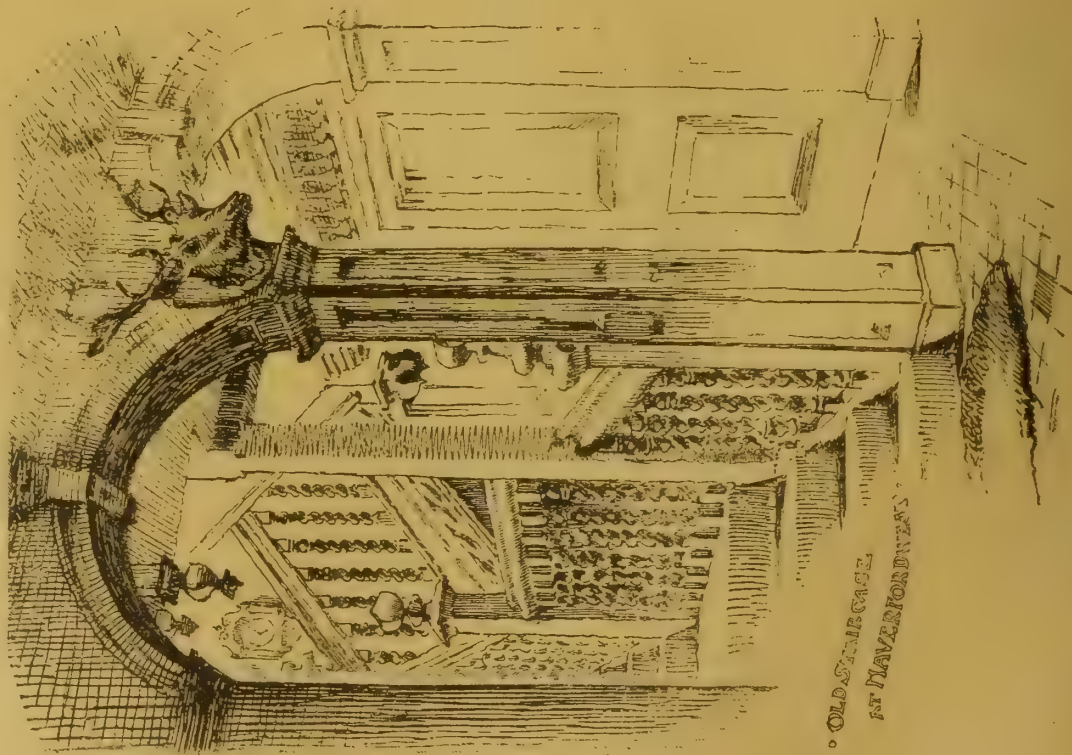
EAST RIDING LUNATIC ASYLUM, BEVERLEY: SOUTH-EAST ELEVATION.

Blackfriars," by George Corfe, M.D., published by Elliot Stock. The hall of the society is surrounded with historical associations. It occupies, with its laboratories, warehouses, dispensary establishment, and court rooms, an area of three-quarters of an acre. The Wardrobe in the reign of Edward VI. was brought to the dissolved monastery of Blackfriars, in which "the lord or abbot of misrule presided from All Hallows eve till the Purification." Close by was the Palace of Bridewell, built by Henry VIII., for the reception and entertainment of Charles V., where, in 1525, a Parliament was held; where, also, Henry himself and his Queen Catherine lodged while the question of their marriage was

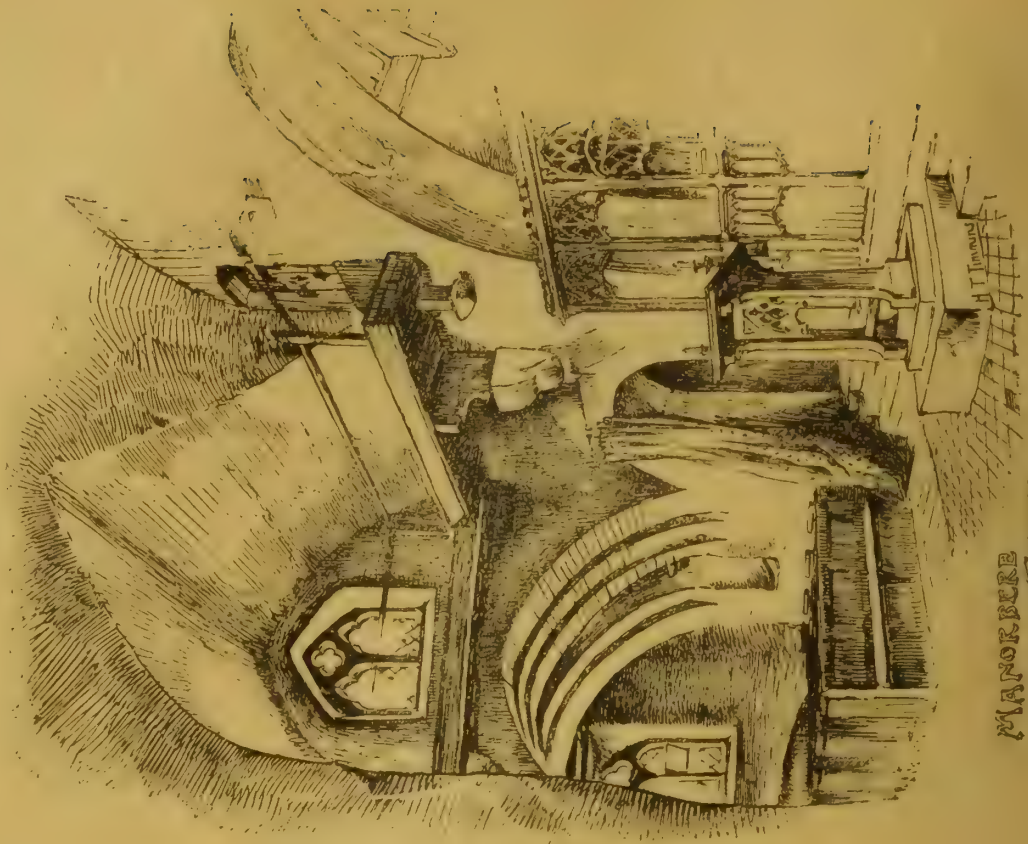
flat, is laid with Roman tiles, with access to same by staircases from the residences. On the two façades the rusticated base columns, entablatures, and main architectural features are of granite, and the wall spaces between covered with the hard stucco used in the locality. The workmanship and materials throughout are to be of the best quality, cedar wood being used for all joiners' work. As the result of the architect's visit to Buenos Ayres last year, local materials and labour are being used almost exclusively in the construction of the buildings. The work is being carried out under the supervision of Messrs. Merry and Raynes, architects, of Buenos Ayres, without the intervention of a general contractor.

to the ground floor, but is arranged for day rooms and single rooms, with nurses' rooms, &c. The second floor is devoted to dormitory accommodation, being divided into four dormitories, each dormitory being overlooked by a nurse's room. The dining accommodation is provided on account of the existing dining hall having already reached the limit of its extension, and the additional day space for 20 patients is necessitated by the crowded state of the present buildings. The architect is Mr. C. H. Hebblethwaite, A.R.I.B.A., P.A.S.I., Hopwood Hall, Halifax, whose design was selected for the first premium by Mr. G. T. Hine, out of 20 sets of designs submitted by 17 architects.





• OLD STONE CAGE,  
AT HAVERFORDWEST.

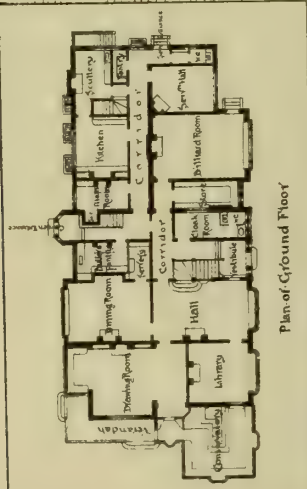


MANORBIER  
CHURCH.

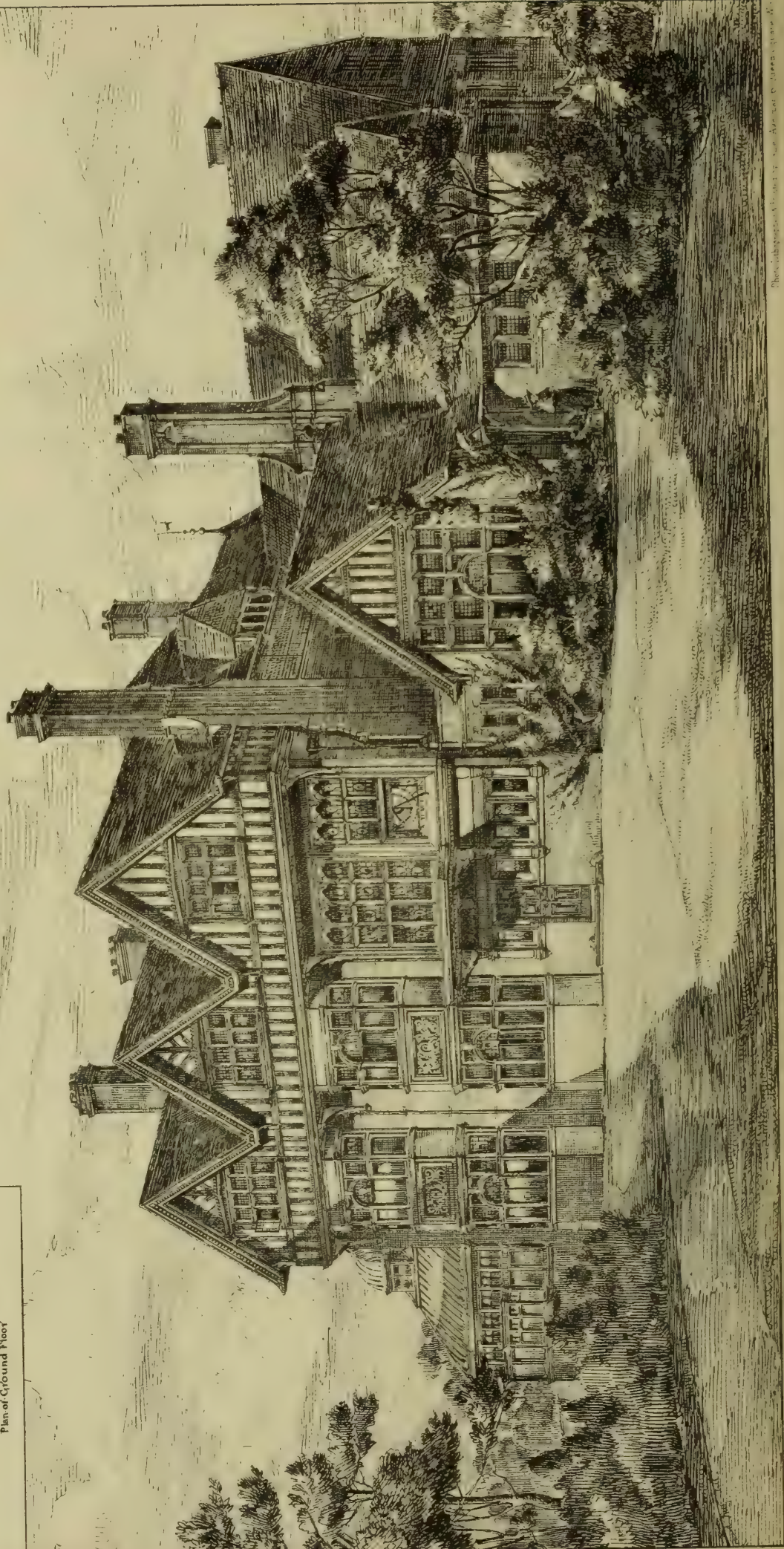








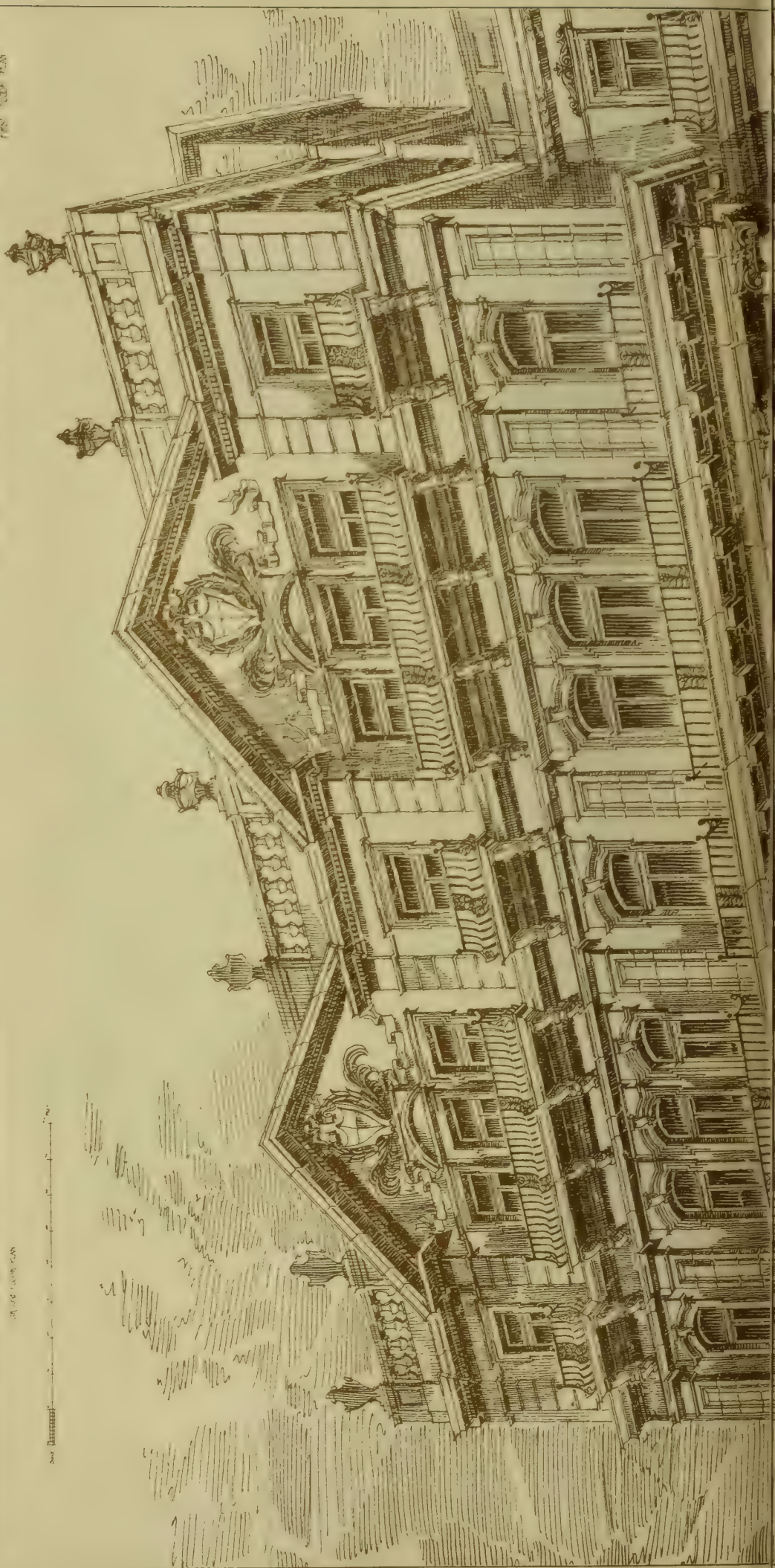
Plan of Ground Floor



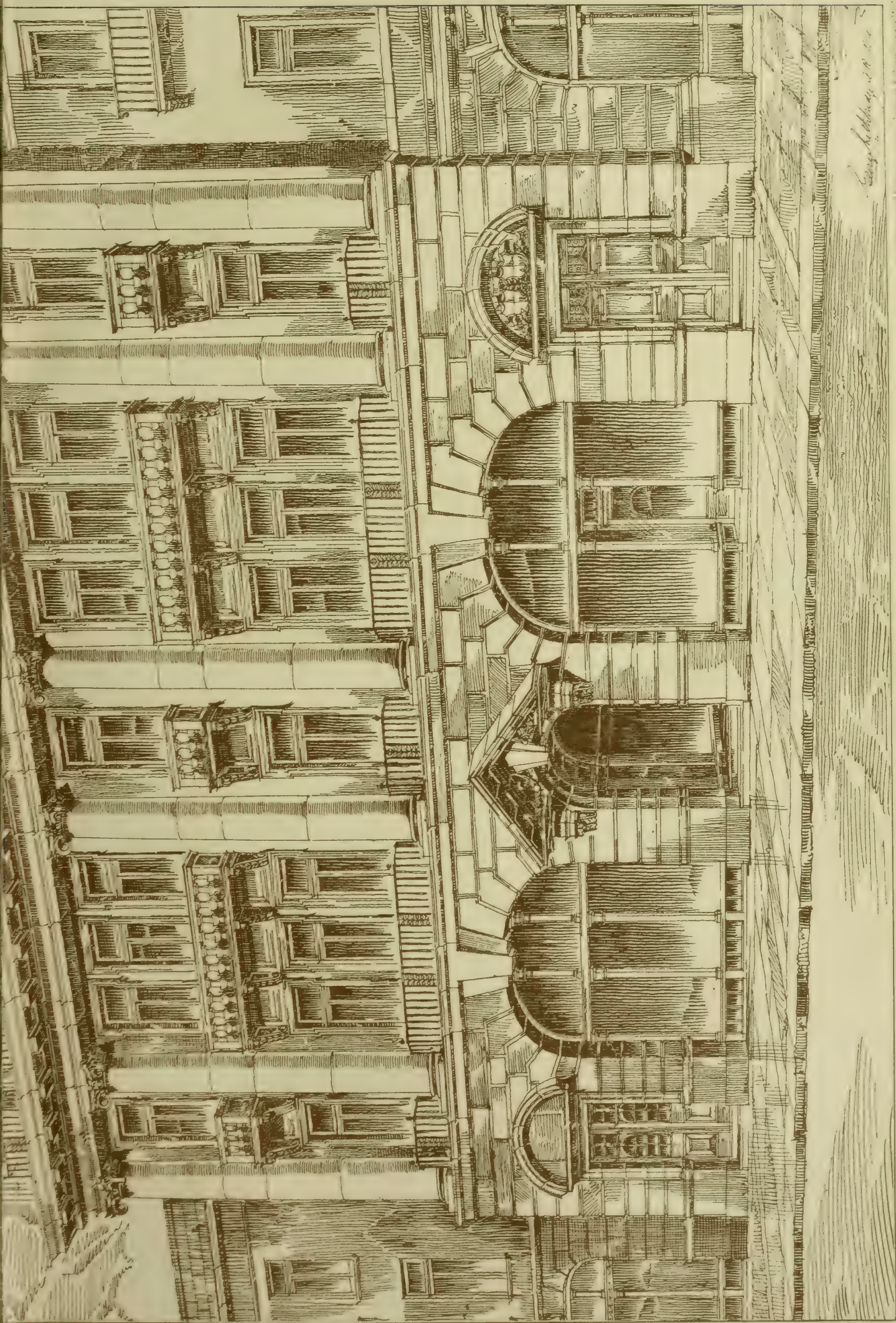












RIVER PLATE TRUST LOAN & AGENCY CO. LD. NEW PREMISES AT BUENOS AYRES. GEO. LETHBRIDGE ARCHT.

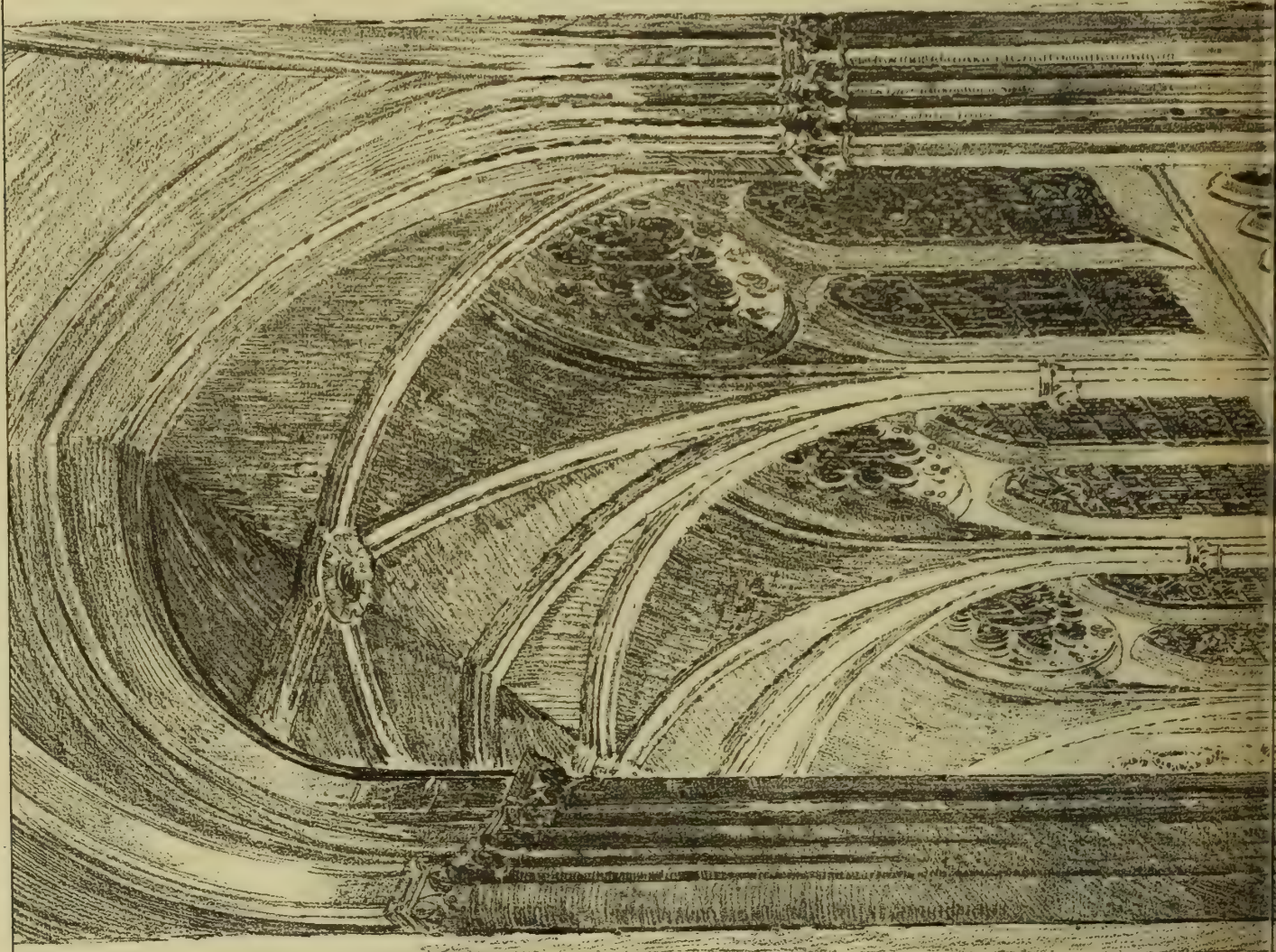




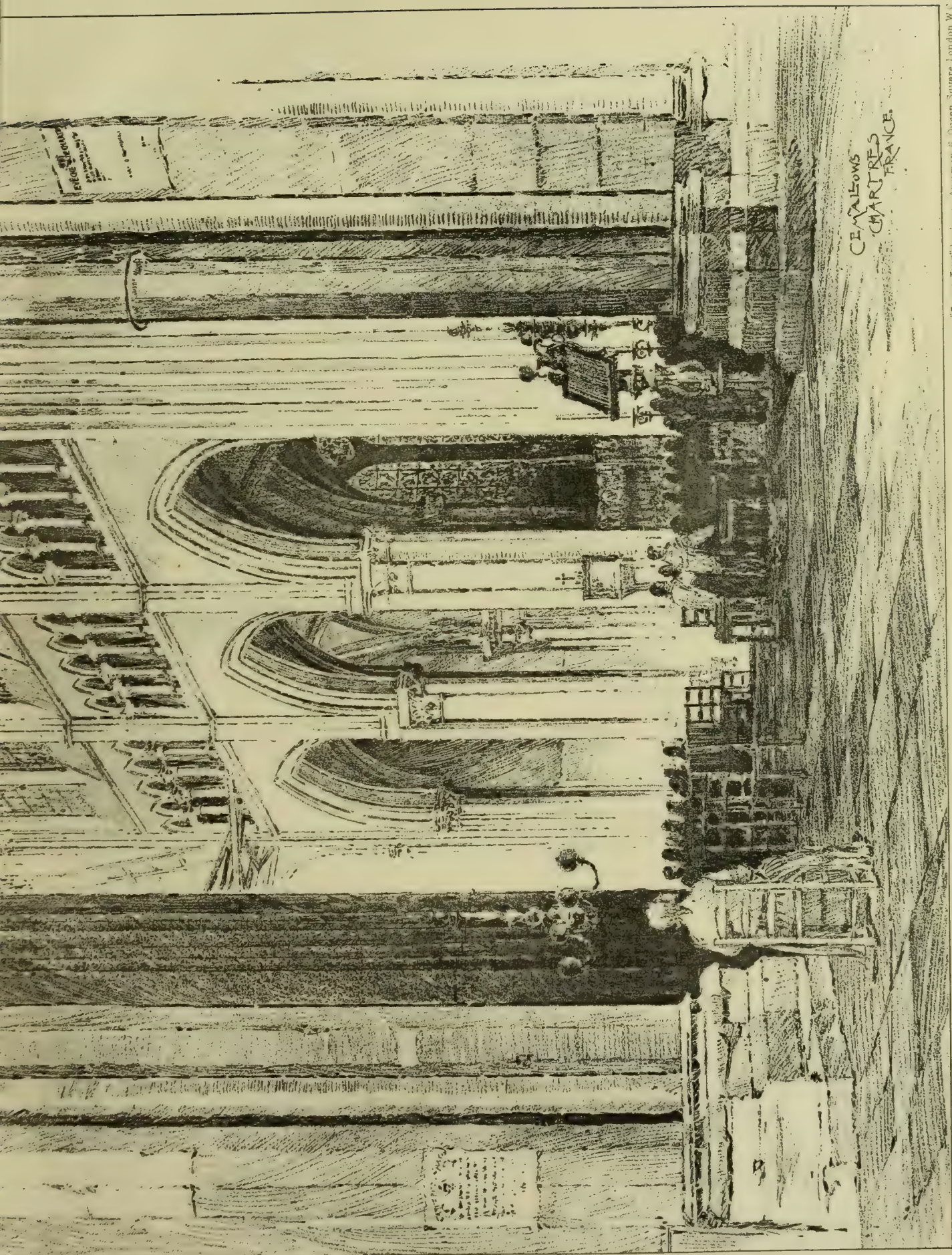












CENOTAPH  
CHARLES  
FRANCE











THE BUILDING NEWS. FEB. 7, 1896.







PHOTOGRAPHED WITH A. SINDELLA. PLATE.

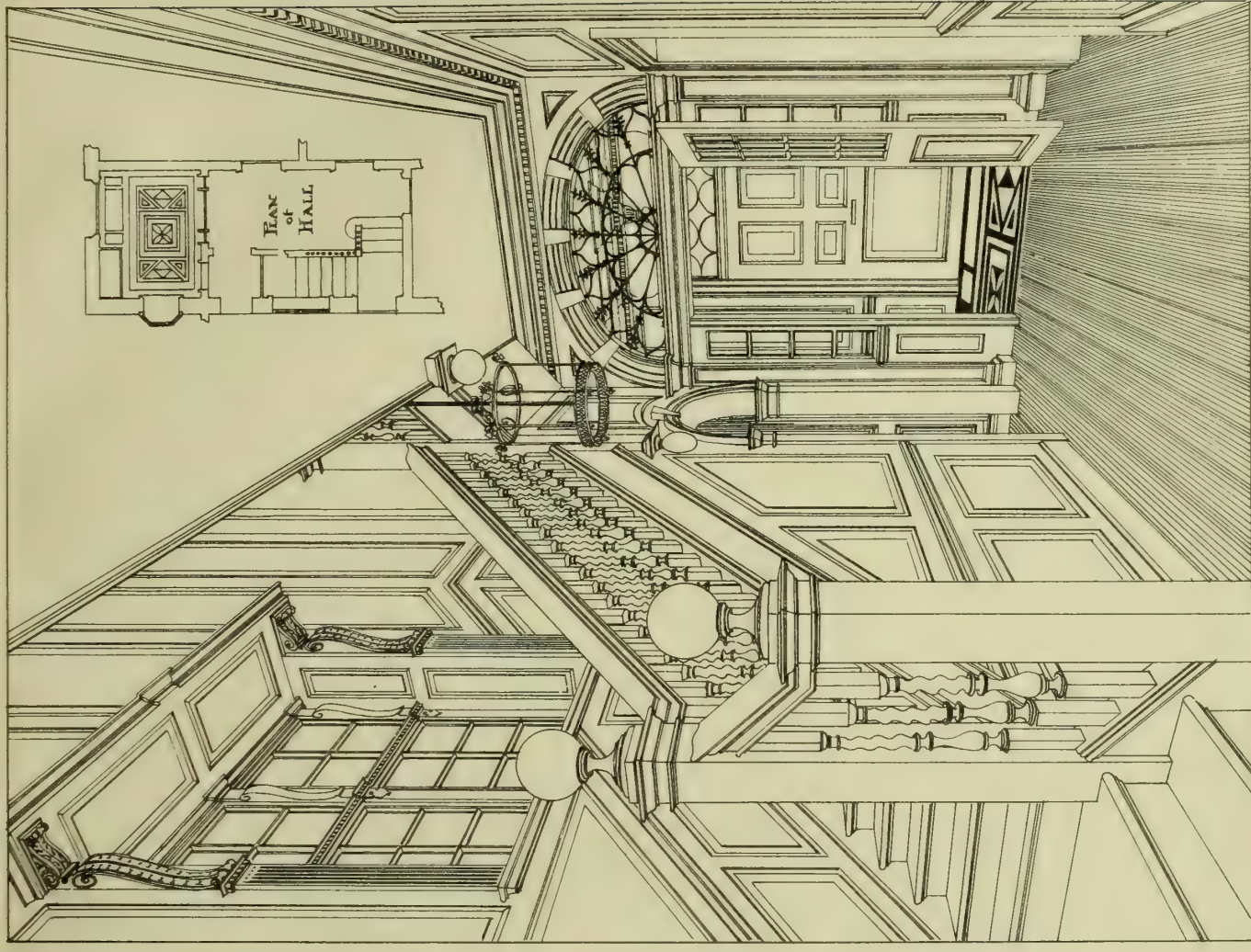
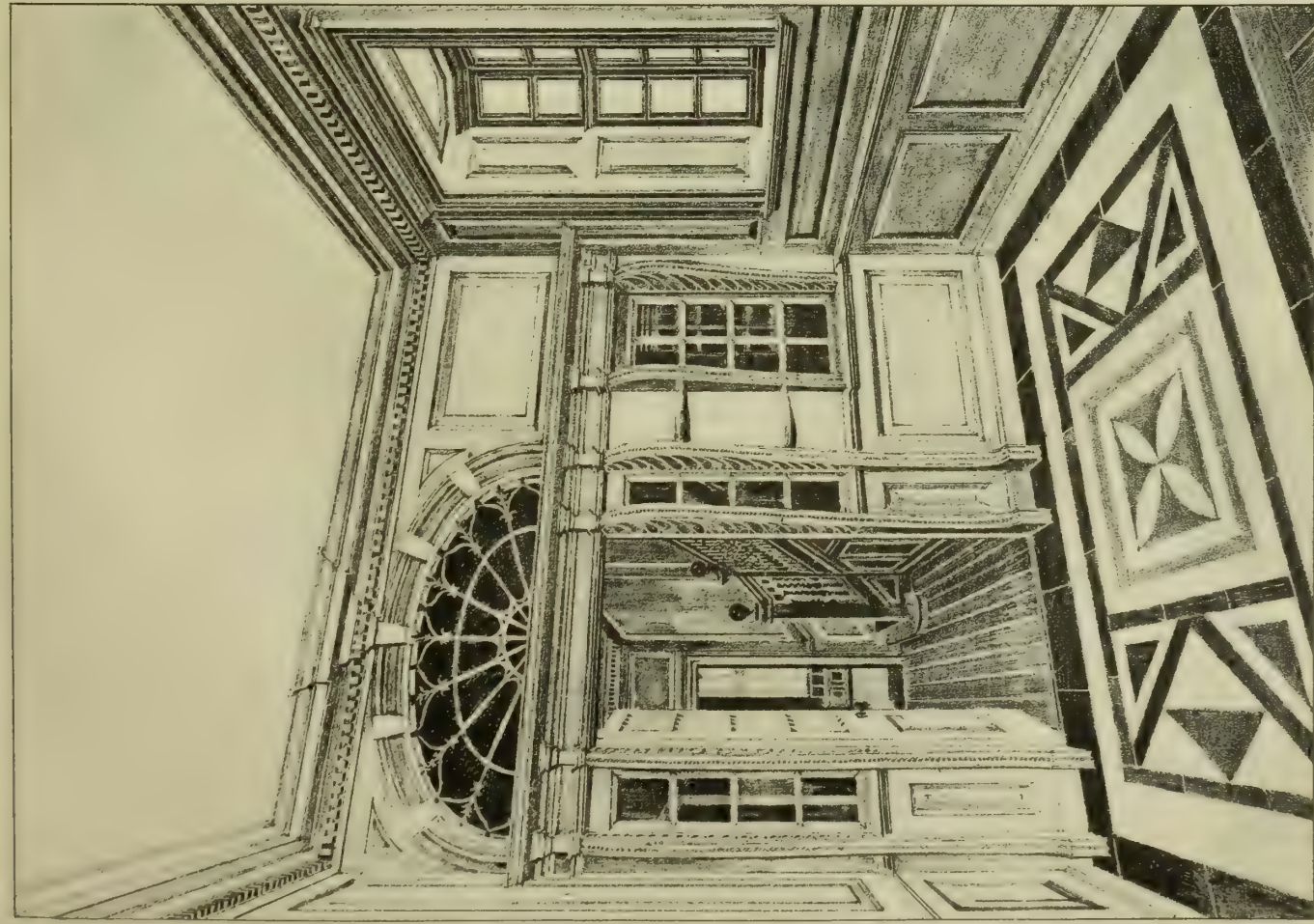
THE CITY GUILDS · NO 16.

"PHOTO-TINT" by James Akerman & Queen Square London W.C.







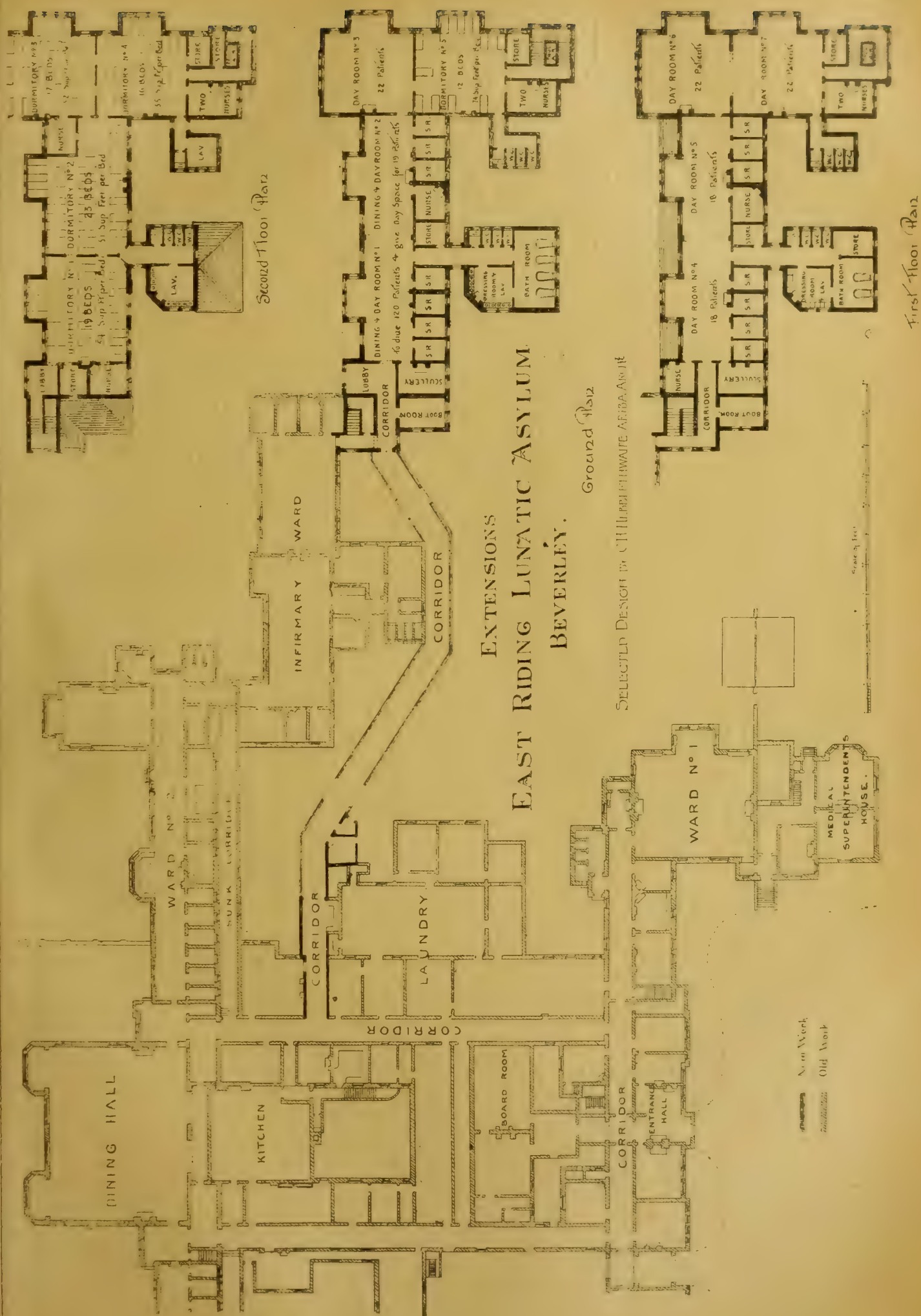


NO 37 FIRST AVENUE · BRIGHTON · HALL & STAIRCASE.  
A N PRENTICE ARIBA ARCHT











## Building Intelligence.

**HAWKHEAD, N.B.**—The first portion of the lunatic asylum which is being erected at Hawkhead, about five miles from Glasgow, for the Govan District Lunacy Board, was formally opened on Jan. 23rd. The present section of the buildings provides accommodation for 430 male and female patients, and have cost about £140,000. Further extensions will hereafter be made, so as to finish a total of 760 beds. The style is Scottish Baronial. Mr. Malcolm Stark, junior, St. Vincent-street, Glasgow, is the architect; Messrs. Alexander Muir and Sons, Eglinton-street, Glasgow, were the contractors for masonry; and Messrs. James Harbertson and Son, also of Glasgow, for the joinery. The farm buildings on a portion of the site have been erected under a separate contract by Messrs. W. Shaw and Son, Glasgow.

**WESTHAM, WEYMOUTH.**—The Bishop of Salisbury recently consecrated the new church of St. Paul, at Westham, Weymouth. Mr. Geo. H. Fellowes-Prynn, F.R.I.B.A., of 6, Queen Anne's Gate, Westminster, S.W., whose design was selected in limited competition by the assessor (Mr. William White, F.S.A.), is the architect. The work was put in the hands of an Exeter builder; but, owing to difficulties, it was eventually completed by the architect, with the assistance of Mr. C. Foad, the then clerk of works. The portion of the church now finished consists of the chancel, vestries, organ chamber, two bays of the nave and north aisle, and south transept, besides the permanent foundation for the complete edifice. The style is a free treatment of Perpendicular work. The plan is simple in form, and consists of a nave, 82ft. in length and 24ft. in width, 54ft. of the total length being included in the portion now carried out. The chancel is 35ft. 9in. in length by 22ft. 6in. in width. On the north side of the nave there is a 12ft. aisle, good-sized vestries and organ chamber being placed on the north side of the chancel. On the south side of the nave a double transept is thrown out, occupying two bays of the nave, the remaining three bays having an aisle similar to that to the north. On the south side of the chancel is placed an apsidal-ended chapel; the south transept forms, as it were, a nave to this chapel. Convenient entrances are placed at the west end of the nave, south transept, and at east of north aisle. Four steps lead from nave to chancel, two from the chancel to sanctuary, and three white marble steps to the high altar. The heating is on the high-pressure small-bore system, and has been carried out by Messrs. Longbottom, of Leeds. The church is built of Portland stone, with dressings and window tracery in Douling stone, and the roof is tiled with Broseley tiles. The cost up to the present has been between £4,000 and £5,000.

## Engineering Notes.

**MORECAMBE.**—The original Morecambe Pier Company, having now nearly disposed of all the claims for damages arising out of the accident last September, are vigorously pushing forward the work of strengthening the pier. The contract for the work, amounting to upwards of £5,000, has been entrusted to Messrs. Murdoch and Cameron, Glasgow. Mr. John Waugh, C.E., of Bradford, the engineer, has eliminated as much timber as possible from the structure, strength being assured by the use of wrought iron and steel. The whole of the pier, promenade, pier-head, and landings are included in the scheme of repair, and will be finished for the commencement of the season.

At the meeting of the London County Council next Tuesday the candidate who will be proposed by the committee of selection for election as the Clerk will be Mr. Richard Hill Dawe, the town-clerk of Hull.

On Friday the Protestant Bishop of Down consecrated the new chancel at St. James's Chapel-of-Ease, parish of Hillsborough, Co. Down. The chapel was built in 1840, and had fallen out of repair. New windows in coloured cathedral glass have been put in, new floor throughout, and the aisles laid down in red and black tiles with border. A chancel has been added, and a new east window in Duncannon stone, which it is hoped to fill with stained glass.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**BRADFORD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The annual meeting of this society was held on Friday night at the Great Northern Victoria Hotel, Bradford. The members present were Messrs. Wheeler Smith (president), Charles Gott, John Hindle, Thomas H. Healey, R. Armistead, Rhodes Calvert, Samuel Jackson, Charles France, T. C. Hope, Richard Horsfall, James Ledingham, Brian Cowgill, W. B. Woodhead, James Young, Herbert Marten, J. Flew, Thomas Barker, C. E. Milnes, C. H. Gott, A. G. Adkin, and B. D. Fairbank (secretary). Mr. Ledingham was elected president for the ensuing year, and Mr. Fairbank was re-elected secretary. Dinner was afterwards served.

**CLERKS OF WORKS' ASSOCIATION.**—The 13th annual dinner of this association was held at the King's Hall, Holborn Restaurant, on Monday evening. Mr. Edwin T. Hall, F.R.I.B.A., occupied the chair, and the company numbered over three hundred. The usual toasts having been honoured, the chairman gave "The Army, Navy, and Reserve Forces," to which Colour-Sergeant J. Aitchinson responded. The healths of "The Architects and Surveyors" was proposed by Mr. E. W. Nightingall, and was acknowledged by Mr. James Brooks, V.P.R.I.B.A., and Mr. J. E. Drower, the latter speaker suggesting that the time might come when, under the régime of the London County Council, the occupation of the quantity surveyor would be gone, and that of the clerk of works either abolished altogether or greatly reduced in status. In proposing the toast of the evening, "Success and Long Life to the Clerks of Works' Association," the chairman expressed his gratification that the committee had always refused to accept outside help from any quarter, and thus maintained their independence. The association was doing a useful work of self-help, and in providing a bond of sympathy between a class of men whose responsible and onerous duties tended to isolate them from one another, and he regretted to hear that their membership roll only contained about 150 names;—the number ought to be largely increased. The President of the Association, Mr. T. Simpson, in replying, said they had been very careful only to admit the best men into their ranks; they were, he felt, doing a useful and needed work. Mr. W. S. Woolcott, Vice-president, proposed "The Company of Carpenters," to whom for the last nine years the association had been indebted for a home and the use of an excellent technical library. Professor Banister Fletcher, J.P., F.R.I.B.A., in responding, urged upon the association the desirability of instituting examinations for, and issuing certificates to, their members. Mr. F. Dashwood, secretary, was also called upon by the chairman, and made a drily humorous response. The remaining toasts were: "The Visitors," proposed by Mr. J. Williamson and acknowledged by Mr. Aston Webb, V.P.R.I.B.A.; "The Press," proposed by Mr. Alexander Ritchie, J.P., C.C. (Steven Brothers and Co.), and replied to by Mr. J. Brady, editor of the *Clerks of Works Association Journal*; "The Hon. Treasurer, Mr. J. Oldrid Scott," proposed by Mr. G. Peacock, and acknowledged for Mr. Scott by Mr. G. M. Berry; and "The Chairman," proposed by Mr. R. Wheeler.

**THE GLASGOW ARCHITECTURAL ASSOCIATION.**—The ordinary monthly meeting was held in the rooms on Tuesday evening, Mr. A. N. Paterson, M.A., in the chair, when Mr. George Gunn, A.R.I.B.A., Ayr, delivered a paper on "A Fort-night in West Somerset," being a tour he took last summer, having gained the Association Travelling Scholarship. The paper was a description of the places he visited, principal among which being Taunton, Minehead, Blue Anchor, Dunster, Wells, and Crocombe; not the least interesting feature of the architecture of Somerset being its even distribution of its interest. There is hardly a portion of the county which will not repay the architect for visiting. Mr. Gunn advised students to make Blue Anchor their centre, as it is extremely rich in things architectural. A large collection of architectural sketches made by Mr. Gunn were shown on the walls, and also photographs, which remain for a fortnight. The paper was also illustrated by lantern slides.

**GLASGOW PHILOSOPHICAL SOCIETY: ARCHITECTURAL SECTION.**—At a meeting of this section, held on Monday, a paper was read by Mr. Charles Gourlay, Professor of Architecture in the Glasgow

and West of Scotland Technical College, on "The Teaching of Architecture in the College." Mr. T. L. Watson, F.R.I.B.A., presided, and there was a good attendance. Mr. Gourlay prefaced his lecture with some general remarks. Architecture he defined to be the art of giving to a building all the perfection which could be bestowed upon it. This perfection was attained when a building was perfectly suitable, perfectly stable, and perfectly beautiful; and no building was worthy of the name of architecture which did not aim at perfection all along these three lines. The lecturer proceeded to show that in the training of students as carried out in that college, they ought to show them that architecture in this full sense was what this definition stated. Architecture was essentially a constructive art, therefore architecture included construction; but its construction should, he urged, be taught in an architectural spirit, not as a branch of engineering, but as architectural construction.

## CHIPS.

The Baptist chapel at Inskip has just recently been renovated from plans prepared by Mr. W. H. Dinsley, architect, of Chorley. The builder is Mr. J. Tomlinson, of Kirkham.

After a long discussion, the city council of Sheffield decided at their last meeting to follow the example of Leeds, and take over the undertaking of the tramways.

Mr. Charles J. Heywood, of Pendleton, has presented to the Salford Corporation a full-sized marble bust, by Swinerton, of his late brother, Mr. Oliver Heywood, with a request that it shall be placed in the museum at Peel Park.

The urban sanitary authority of Menai Bridge have entrusted Mr. R. G. Thomas, architect, with the preparations of the plans of the promenade pier it is proposed to construct at Pont Morgan, at a point between the two landing-stages now used by the Liverpool steamers. Plans for proposed town hall and artisans' dwellings are being prepared for the same authority by Mr. Joseph Owen.

The Royal Scottish Arboricultural Society, at its annual meeting in Edinburgh, heard a statement from Mr. Munro Ferguson, M.P., the president, as to the representation that had been made to the Board of Agriculture in regard to the establishment of a Forest School in Scotland. It was proposed that a forest area should be acquired, partly under timber, and it was thought that the scheme would cost somewhere about £30,000 to £40,000. The matter was now under the consideration of the Board of Agriculture.

The Russian architect, Michael Mikeschine, who drew the plans for the monument to Rurik, the founder of the Russian Monarchy, erected at Nijai Novgorod in 1862, and for the statue of the Empress Catherine II. at St. Petersburg, died on Friday, from the rupture of an aneurism.

The National Schools, Wadhurst, Sussex, are being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators and inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother of Manchester.

Operations in connection with the building of the works at Weston Point, Runcorn, for the Castner-Kellner Chemical Company, were commenced on Monday by the building of a stone embankment in order to uphold the boundary of the land which abuts on the banks of the Weaver Canal. The construction of a tall chimney is to be begun forthwith. The company have acquired a site of about 40 acres of land, and the entire cost of the works it is proposed to construct is estimated at £130,000.

The Markets Committee of the Leeds Corporation have under consideration an amended report by the city engineer, Mr. Thomas Hewson, respecting the proposed rearrangement of Kirkgate markets. This remodelling is rendered partially necessary by the intended widening from 45ft. to 75ft. of Vicar-lane, on which the covered market abuts, and the cost of the reconstruction of the markets is roughly estimated at £50,000.

The Board of Trade have drafted and issued new regulations under the Electric Lighting Acts, 1882 and 1883. The regulations are the outcome of the conference of electric lighting authorities and others held in London last November, and of the definition of "pressure" settled by Lord Kelvin, Mr. W. H. Preece, and Major Cardew as a committee of experts. An amended definition of pressure is given, and the regulation relating to street receptacles for electric lines has been rendered more stringent in its provision for isolation.

The town council of Leith adopted, on Tuesday, plans by Mr. Simpson, of that burgh, for the public baths to be built in Henderson-street, at an estimated cost of from £10,000 to £12,000.



## THE TIMBERS OF AUSTRALASIA.—II.

## THE HARDWOODS.—I. NEW SOUTH WALES.

THERE are few departments of science connected with building construction and engineering, in which greater confusion (or, at all events, a lesser degree of accuracy and certitude) exists than in the knowledge and classification of the timbers of Australasia. Even the botanical names are not entirely free from confusion, though this is daily diminishing as the botanical and other experts are brought more and more into touch and contact with each other. At the same time, the fact has become pretty generally recognised that the employment of the Latin scientific names is the only effectual remedy against inaccuracy and confusion, and accordingly architects and engineers have repeatedly been recommended to use—and often do use—these titles in their specifications. So much explanation appears to be necessary lest I should be accused of pedantry in the employment I may make hereafter of the Latin names of the timbers I shall have to speak of.

It would be altogether beyond the scope and object of these articles to sketch, however briefly, the growth of forestry in Australasia. Suffice it that its history dates back to 1688, and commences with the famous navigator, Dampier (whose herbarium is still preserved at Oxford), and includes the names of men no less celebrated in the botanical records of the world than Dr. Lindley, Sir Wm. Hooker, and Baron von Müller, in the last "forties" and "fifties." Those who may be curious in the matter will find a good deal of interesting information in the paper on "Australian Timbers," mentioned in the first of these articles as having been read by Mr. George S. Perrin before the Royal Victorian Institute of Architects, and a copy of which I believe is in the library of the R.I.B.A., in Conduit-street, London, W. Passing, then, to the subject more immediately concerned, I should at once explain that I have no intention of dealing with any timbers other than those which may be advantageously employed in countries foreign to Australasia. The number of the timbers produced in the seven Australasian colonies—the classification of these was first attempted in 1854, when specimens were obtained for the Paris Exhibition of the following year—is simply enormous, and considering that the climate of this quarter of the world embraces (if we include that of the Alpine region of the New Zealand snow peaks) every variety, from that of Norway to that of India, it can be no source of wonder that such multitudinous products should vary as greatly as they do in qualities and characteristics. Many of the timbers are practically worthless, excepting for the roughest purposes; while others, though they may be profitably employed in the localities where (or comparatively near to which) they grow, could not compete in either the European or the American markets with other woods of as great, or greater, serviceableness, obtained from sources more accessible, and consequently more cheaply. But there still remain a number of timbers of the very highest value to the architect, the engineer, the surveyor, the builder (with whom, for present purposes, must be classed the coachbuilder and especially the shipbuilder), and the cabinetmaker, in any and every part of the world; while it is no exaggeration to assert that for certain specific and most important purposes (which it will be my business to point out) the hardwoods of Australia (and particularly the pale hardwoods of New South Wales) are absolutely and altogether without a rival.

The timbers of Australasia—and this term I desire to be understood in future as applying only to those which it is desirable to export—belong botanically to a good many different Natural Orders, of which by far the most important is the exogenous *Myrtaceæ* or *Myrtles* (Nat. Ord. 85), as it includes the genus *Eucalyptus* (the Australian gums), which furnishes the majority of the hard woods. The Australian species alone (to say nothing of a great many varieties) of this vast genus number 136, according to Mr. Maiden; or, according to Mr. Perrin, 170, of which 53 are found in New South Wales. The *Eucalypts* have hitherto been mostly grouped according to their barks, by which means are obtained two of the most important and best defined families—viz., the iron barks and the stringy barks. It would seem desirable, however, to adopt a classification according to the colour of the timber, in order that the superior value of the pale hardwoods—by which term are meant those which vary in colour,

when quite fresh, from white to a very pale brown, and are almost or completely free from a reddish tinge—may be the more distinctly emphasised. This appears to be specially important with reference to the English market, since Mr. Gavin Scott informs me that during his recent visit to the Old Country he found a rooted prejudice in favour of red woods—a prejudice due, no doubt, to the unsatisfactory experience of pale timbers obtained from other colonies; but one which those who entertain it will do well to disabuse their minds of with the smallest possible delay. Not only do the pale hardwoods of New South Wales wear, as a rule, better than almost any of the red timbers, but the supply is very much larger, and the price must consequently remain cheaper; indeed, the supply of the pale hardwoods is practically unlimited.

The most convenient mode of studying the characteristics and qualities of the hardwoods will, perhaps, be under the headings of the different colonies in which they are met with—or, rather, as the most valuable of them have their home in the mother colony, to describe them under the head of New South Wales—and to supplement their description with whatever additional information may be necessary when I come to the other colonies. The matter of wood paving can then be dealt with separately by itself before I pass to the consideration of other woods.

## NEW SOUTH WALES.

The most important and valuable hardwoods of the Mother colony are the following:—

Ironbark (4 species) ...	<i>Eucalyptus paniculata</i> (white, grey, or "She").
	<i>E. crebra</i> (narrow-leaved, white or grey).
	<i>E. siderophloia</i> (broad-leaved).
	<i>E. sideroxylon</i> or <i>leucosylon</i> (Warren) (red).
Stringy bark (3 species) ...	<i>E. capitellata</i> (silvery or broad-leaved).
	<i>E. Eugenioides</i> (white).
	<i>E. macrocarpa</i> (red).
Messmate ...	<i>E. obliqua</i> .
Blackbutt ...	<i>E. pilularis</i> .
Spotted gum ...	<i>E. maculata</i> .
Blue gum (2 species) ...	<i>E. saligna</i> (Sydney, which includes flooded gum).
	<i>E. Maidenii</i> .
Bastard blue gum ...	<i>E. gonocaulis</i> .
Grey gum ...	<i>E. gonocaulis</i> .
Mountain gum ...	<i>E. resinifera</i> .
Forest mahogany ...	<i>E. resinifera</i> .
Swamp mahogany ...	<i>E. robusta</i> .
White mahogany ...	<i>E. acmenoides</i> .
Mountain ash ...	<i>E. leberiana</i> (maiden) or <i>virgata</i> (Coghlan).
White ash ...	<i>R. stricta</i> .
Tallow wood ...	<i>E. microcarpa</i> .
Box (3 species) ...	<i>E. pol. anthema</i> (true red).
	<i>E. hemiphloia</i> (white, grey, pink, and "red").
	<i>E. melliodora</i> (yellow).

Brush box (or woolly butt) ...	<i>Tristania conferta</i> } Nat. Ord.
Turpentine ...	<i>Agropyron laurifolia</i> } <i>Myrtaceæ</i>
Beech (or white beech) ...	<i>Gmelina Leichhardtii</i> (Nat. Ord. <i>Verbenaceæ</i> ).

The following hardwoods, though found in New South Wales, belong more properly to other colonies:—

Blue gum ...	<i>E. globulus</i> (a different timber from those mentioned in the foregoing list).
Manna gum ...	<i>E. viminalis</i> .
Red gum (2 species) ...	<i>E. rostrata</i> (River Murray).
	<i>E. tereticornis</i> (Forest).
Blackwood ...	<i>Acacia melanoxylon</i> (Nat. Ord. <i>Leguminosæ</i> ).

The subjoined is the latest classification of the pale and red hardwoods (exclusive of the ironbarks and stringy-barks) published by Mr. Maiden in November last:—

PALE HARDWOODS.—	Blackbutt ( <i>E. pilularis</i> ).
	Spotted gum ( <i>E. maculata</i> ).
	White mahogany ( <i>E. acmenoides</i> ).
	Tallow wood ( <i>E. microcarpa</i> ).
	Grey box ( <i>E. hemiphloia</i> ).
RED HARDWOODS.—	Sydney blue gum ( <i>E. saligna</i> ).
	Grey gum ( <i>E. propinqua</i> ).
	Red (or forest) mahogany ( <i>E. resinifera</i> ).
	Murray red gum ( <i>E. rostrata</i> ).
	Forest red gum ( <i>E. tereticornis</i> ).

Ironbark (*E. paniculata*, *E. crebra*, *E. siderophloia*, and *E. sideroxylon*) has been rightly called the "king of hardwoods," and is considered to

\* This timber must not be confounded with *E. gonocaulis*, sometimes called grey gum, and given in my own list above of the most important and valuable hardwoods. While omitting some of the timbers mentioned by Mr. Maiden as being unsuited to purposes of export, I speak of this grey gum on account of its extreme resemblance to ironbark, for which, though remarkably durable, it is an altogether inferior substitute. In texture it is less horny and more brittle; its strength is very much smaller, and when used for railway sleepers the bolts and spikes work loose in it. Its local value in various ways, however, justifies Mr. Maiden's inclusion of it in his list of hardwoods.—D. L.

be the strongest timber in the world. It grows extensively in New South Wales, where it is widely distributed; and being a slow-growing tree (like several other of the New South Wales *Eucalypts*), it generally reaches its utmost perfection on the poorest soil. It is this peculiarity which renders many of the hardwoods of the mother colony so exceptionally valuable. The heat and dryness of the climate, and the poorness of the soil, where some of the gums thrive best, produce a quality of timber totally different from the sappy wood grown rapidly in moister and more temperate regions, such as the luxuriant forest of Tasmania. The tree attains an average height of over 100ft., with a diameter of about 34in., and a straight, even bole; the true white (or "she") ironbark (*E. paniculata*), however, often reaching to 150ft. Regarding the different species, the one just named is closer in grain (and therefore more difficult to work) than the others, and also less plentiful; still, it is the very best kind of ironbark, and, with its beautiful wavy appearance, the most valuable of all. It derives its name from its extremely pale and slightly pinkish colour when green, which darkens, however, during the process of drying. The most plentiful species, and that which attains the largest proportions, is the narrow-leaved, white or grey ironbark (*E. crebra*), which comes next in value to *E. paniculata*, and reaches Sydney in considerable quantities from the northern rivers of the colony. Thereabouts it is best known in connection with public works, particularly the construction of large timber bridges, the magnificent piles and girders, in lengths up to 60ft. and 70ft., being furnished by it. The wood is of a rather pale red colour; but though very durable, scarcely as strong as either *E. paniculata* or *E. siderophloia*. The latter (likewise of a reddish colour, slightly darker than *E. crebra*), bears the very highest reputation for combined durability and strength, and is therefore extensively employed for the large beams in heavy-goods stores, for railway-sleepers, and for other purposes where extreme strength is required. In the Sydney Technological Museum, which contains a very large collection of the timbers, not only of Australasia and Oceania, but of Europe and America (and even Africa) as well, are two sleepers of this ironbark, lately removed from the main line of the Great Western Railway of New South Wales, after 24 and 25 years' service respectively, and which appear to be as strong and solid as ever they were. When such sleepers have to be removed, it is not owing to the decay or disintegration of the wood, but on account of the holes made in the sleeper by the renewal of bolts and spikes. The timber of this species from the Clarence River and further north is apt to shell and split upon exposure, and hence is not liked for engineering purposes; fortunately, however, its distribution in other districts is very extensive. The *E. sideroxylon*, commonly called simply ironbark, red ironbark, red flowering ironbark, and sometimes by the extraordinary name of "flat cake," is the darkest of all the species in the colour of the wood. Its reputation for strength and durability stands very high where it is not required in long lengths, which cannot always be obtained, and it appears to be all but imperishable. It grows very largely in many parts of the colony, and is widely diffused over the auriferous districts of the western interior. Like the preceding species, however, it requires to be used with caution, particularly in buildings, since the timbers from the Clarence and the Richmond River districts are very free in the grain, and subject to shelling in concentric rings; though, happily, the ring shakes, however serious a defect, seem peculiar to these two districts only.

DE LIBRA.

(To be continued.)

## MISTAKES IN THE BUILDING TRADE.

AT a meeting of the members of the Glasgow Building Trades Exchange, held on Friday, Colonel Bennett presiding, Mr. Alexander Muir (of Messrs. Alex. Muir and Sons) read a paper on "Mistakes in the Building Trade." Mr. Muir spoke of the grandeur of the buildings of the ancients, and laid the blame of our pettier structures in these days on the fever heat at which we now lived. Our buildings, like everything else, were "rushed." In the far back days buildings were planned and erected calmly and without hurry, and consequently gained in dignity. Even within this century very much more time was allowed to builders than at present,



and then builders seemed to take more enjoyment out of life, labour less, and gain greater profits. In these days very many proprietors were resolved on getting a magnificent structure at a ridiculously small price. They started the economising process by employing an inferior architect, and architect and measurer too frequently combined to persuade the economist that his notions could be carried out for the sum he proposed to expend. In the end he discovered that the cost was greatly in excess of the anticipation. This method of doing things told against the contractor, as, in order to keep the proprietor as long as possible in ignorance of the ultimate cost, he was only granted instalments in proportion to the schedule price, and was consequently kept lying out of considerable sums. At the end of the contract, too, there was always the greatest difficulty in getting payment for the inevitable extras from the disgusted proprietor. In connection with these extras Mr. Muir protested against the practice of architects or measurers altering the contractor's prices without consulting him, and of submitting these to a clerk of works to be checked. They ought to be gone over with the contractor himself and adjusted. In all contracts the selecting of an efficient inspector was very essential. He dwelt on the old custom of contractors measuring the work for themselves, which, he stated, was of course impossible in that city. The practice was, however, still carried on in Australia, and, apparently, beneficially to not a few contractors. He advocated the strict adherence where practicable to the adopted modes of measurement and clear details in schedules as tending to prevent mistakes and misunderstandings, and spoke strongly against measurers endeavouring to get cheaper estimates by misleading descriptions in schedules. Mr. Muir vigorously deprecated the over-anxiety of contractors to secure, if possible, every contract that was issued for the mere sake of leaving monuments to their memory. He held that no contractor should take a contract unless at a reasonable profit. The present keenness of competition was not conducive to good work. Every man should have time to eat, drink, and enjoy the fruits of his labour. He regretted that in the design of the new Art Galleries, erected by Glasgow funds, the gentlemen responsible should not have seen their way to employ Glasgow talent, of which he contended there was abundance; and that in connection with the Jamaica Bridge, for the sake of a few thousands, the original broad scheme should have been abandoned for patch-work.

#### GRAPHICAL DETERMINATION OF THE STRESSES IN THE MEMBERS OF A COLLAR-BEAM ROOF-TRUSS.—III.

WE now come to the case in which the given forces acting on the truss may be any whatever. If any of the forces be given as distributed along any members of the truss, we must refer any such to the various joints, and the forces here called the "given forces" may have had to be found as the resultant effects at the various joints of wind and other pressures acting on the roof.

Let  $ABCDE$ , Fig. 6, represent a collar-beam roof-truss; and let the forces  $F_1, F_2, F_3, F_4, F_5$  be given as acting at the joints, as shown in the figure. Before we begin the stress diagram, the two resistances at  $A$  and  $E$  must be determined. Let us first suppose them to be parallel, and let  $abcdef$ , Fig. 7, be the unclosed polygon of the five given forces; then,  $af$  representing the resultant of the given forces,  $fa$  will represent the resultant of the two required resistances, and will in this case be parallel to their lines of action, and equal to their sum.

At the risk of being tedious to some of my readers, let me here point out that the polygon of forces alone does not enable us to completely determine the resultant of a number of given forces, unless those forces all act through the same point, since it does not show how any point in the line of action of the resultant is to be found. The resultant may, however, be completely found by repeated use of the parallelogram of forces instead of the polygon of forces; or it may be found by the polygon of forces and a funicular polygon, as follows:—

Fig. 7. Take any point,  $O$ , for pole, and draw the vectors  $0a, 0b, 0c, 0d, 0e, 0f$  to the angles of the force polygon. In Fig. 6, starting from any point in one of the lines of action of the given forces—as, for instance, the point  $l$  in the line of action of  $F_1$ —draw the unclosed funicular

polygon 1, 2, 3, 4, 5, having its angles respectively on the lines of action of the given forces. Observe that the side of the funicular polygon which terminates on the lines of action of any two of the given forces is parallel to that vector in Fig. 7, drawn from  $O$  to that point of the force polygon in which the corresponding forces meet. Thus the side 3, 4 is parallel to  $0d$ , the vector drawn from  $O$  to the point in which  $F_3, F_4$  meet. Or, to put the matter in another way, the three lines which meet at any angle of the funicular polygon, are parallel respectively to three lines which form a triangle with  $O$  for vertex, and the corresponding force for base in the force polygon.

Following out this principle, we see that the point  $V$ , in which the lines  $1V, 5V$ , parallel respectively to  $0a, 0f$  meet must be a point in the line of action of  $R$ , the resultant of the given forces. Therefore,  $VW$  drawn parallel to  $af$  is that line of action, and thus the resultant is completely found. The magnitudes of the two resistances may now be found by either of the methods explained in II. Thus Fig. 6 produce  $V1$  to meet  $AA_1$ , at  $A_1$ , and  $V5$  to meet  $EE_1$ , at  $E_1$ ; join  $A_1E_1$ , and in Fig. 7 draw  $0k$  parallel to  $A_1E_1$ , to meet  $fa$  at  $k$ ; then  $fk$  and  $ka$  are the two required resistances which act along  $E_1E, A_1A$  respectively.

Fig. 8. With the other conditions as in Fig. 6, suppose  $E_1E$  to be given as the direction of the resistance at  $E$ , and  $abcdef$ , Fig. 9, to be the polygon of the given forces. We will here show how to find the direction of the other resistance, and the magnitudes of both without having to use the resultant of the given forces.

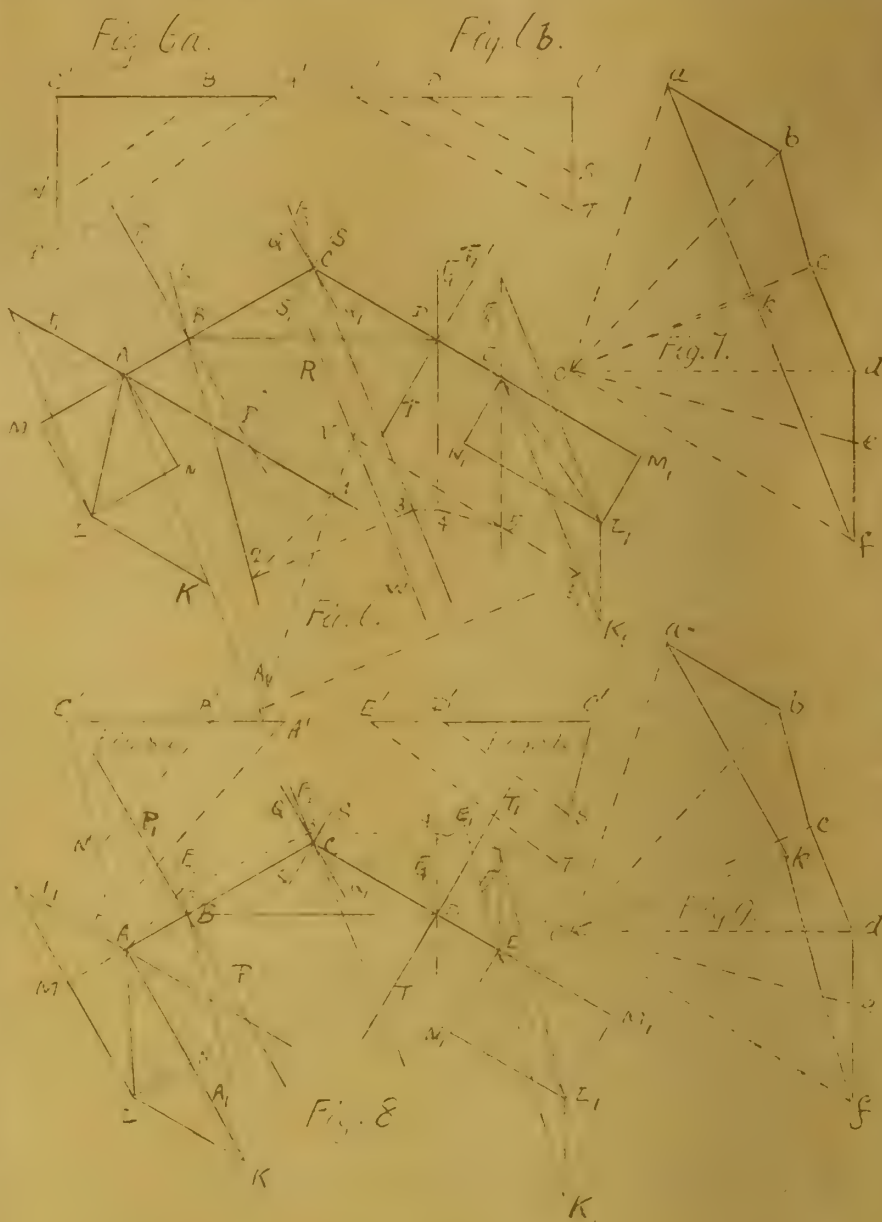
$A$  is a known point in the line of action of the resistance at  $A$ . It is also a point in the line of

action of  $F_1$ , one of the given forces. Draw, then, starting from  $A$ , Fig. 8, the funicular polygon  $A, 2, 3, 4, 5, E$ , with respect to the pole  $O$ , Fig. 9. Join  $A, E_1$ , and, in Fig. 9, draw  $0k$  parallel to  $AE_1$ , to meet  $fk$ , parallel to  $E_1E$ , at  $k$ . Join  $ka$ , then  $fk$  represents the resistance at  $E$ , and  $ka$  that at  $A$ . Hence  $KA$ , Fig. 8, equal and parallel to  $ka$  in Fig. 9, will completely represent the resistance at  $A$ .

The reasoning and constructions given above, and in Chap. II., must not be regarded as belonging peculiarly to this form of truss—they apply to all trusses.

#### NATIONAL ASSOCIATION OF MASTER BUILDERS.

THE report of the council, presented at the half-yearly meeting of this association, held on Friday in London, states that the building trades generally show signs of continued improvement, judging from the returns received from the various parts of the United Kingdom. With regard to the Employers' Liability Bill, no further proposed legislation on this subject has been proceeded with in the House of Commons since the session of 1893. In all probability further steps will be taken on this matter in the ensuing session, and very likely the special feature of the late Government Bill, providing against the workman contracting himself out of the benefit of the Act, may be omitted or modified. The Plumbers' Registration Bill, introduced in the session of 1892, has not been further proceeded with in the House since the last report. The council again urge their recommendation to the members to adhere to the use of the form of





contract issued by this association. The friendly correspondence with the National Association of Master Builders of the United States and the Master Builders' Association of the Australian Colonies continues.

### THE BUILDING CONTRACT OF THE LONDON COUNTY COUNCIL.

A LONG discussion, enlivened by several divisions, took place at Tuesday's meeting of the London County Council relative to certain proposed alterations in the form of building contract, in the direction of relaxing the stringency of certain clauses. The General Purposes Committee reported last week that, owing to complaints to three other committees by Messrs. Holloway and other builders as to the present form of contract, they had heard a deputation from the Institute of Builders, and now recommended that certain charges should be made. The proposals of the Institute of Builders were:—

- (1) That the London wage schedule should only apply within twelve, instead of twenty, miles of Charing Cross.
- (2) That wages in country districts should be those recognised, and in practice obtained, by "the several trades" (instead of "the several trade unions") of the district.
- (3) That legally bound apprentices and artied improvers should be allowed on the jobs.
- (4) That the penalty for excessive hours of labour should be omitted, and that as regards overtime "the rules of the trade" should be substituted for "rules of the trade union."
- (5) That the rule requiring the official wage list to be exhibited at the works should be omitted.
- (6) That wage-books, &c., should no longer be open to inspection by any person appointed by the Council except the architect.
- (7) That the provision enabling the Council to pay the difference to any man receiving less than the scheduled rate of wages, and deduct the amount from the contract price, should be left out.
- (8) That an independent arbitrator, instead of the Council's architect, should decide on matters in dispute.

The committee recommended that no alteration should be made in regard to points 1 and 2; that in regard to 3 "a reasonable number of legally bound apprentices" should be allowed; that no change should be made in regard to 4 and 5; that as regards 6, the contractor should produce the books when required by the clerk of the Council to any person the clerk might appoint; that no change should be made in regard to 7; and (8) that provision should be made for an appeal to an independent arbitrator.

An amendment by Mr. Walter Emden, seconded by Mr. Reed, that the Builders' Institute proposal No. 1, reducing the radius from Charing Cross from 20 to 12 miles, be adopted, was defeated by 61 votes to 48, as were several other proposals. Eventually the report of the committee was passed, with but one alteration—viz.: the clause which compelled the contractor, under a penalty of £10, to furnish a statutory declaration that all the entries in his books relating to the contract were correct. An amendment in favour of omitting this clause, which was characterised as unnecessary and insulting, was carried by 62 votes to 53.

The Edinburgh Town Council have decided, after a long discussion, to proceed with the erection of the proposed traffic bridge from Jeffrey-street to Low Calton.

At the last meeting of the City Court of Common Council, it was announced that the late Mr. E. J. Brett had bequeathed to the Corporation two large oil paintings, which were intended for exhibition at the Guildhall Art Gallery. One work was by Daniel Maclise, R.A., and represented a scene from the trial of William Wallace; and the other was by R. Barchett, representing Henry VI. attacked by Edward IV. and taking sanctuary. The former measures 5ft. by 4ft., and the latter 7ft. by 5ft.

St. Leonard's Church, Glaphthorn, was reopened after restoration on Tuesday week. The works have included extension, repair, and renovation, new floors, and entire reseating. Mr. S. F. Halliday, of Stamford, was the contractor, and Mr. J. C. Traylen, of the same town, the architect. The outlay has been £1,200.

A Local Government Board inquiry was held on Tuesday week at Hinckley, with reference to the application of the district council for permission to borrow £5,000 for works of sewerage and sewage disposal.

### OBITUARY.

M. FRANÇOIS CLEMENT BAECKELMANS, architect, of 10, Rue Large, Antwerp, died on January 25th, in his 69th year, and was buried four days later at the Durne Cemetery in that city. M. Baeckelmans, who was elected an Honorary Member of the Incorporated Society of Architects in 1891, was a Chevalier of the Order of Leopold, and held many important offices in Belgium, being a professor of the Institute of Fine Arts at Antwerp, of which body he was a past president of council, a member of the Royal Commission on Monuments, and of the Royal Commission on International Exchanges, of the Archaeological Academy of Belgium, of the Royal Academy of Fine Arts of Antwerp, one of the committee of Monumental Art of the Royal Museums of Decorative and Industrial Arts, and also a member of the Museum of Antiquities of Antwerp, and of the Archiepiscopal Commission of Monuments at Malines, &c. M. Baeckelmans was the architect for the restoration of Antwerp Cathedral—a work which has not met with universal approbation by English architects—and many other churches in Belgium. He leaves a widow (*née* Louise van Meerbech), five sons, and three daughters.

MR. JAMES JOHNSTON, of Otley, a director of the Leeds Fireclay Company, Limited, died at the company's works, in Elland-road, Leeds, on Tuesday week, from apoplexy. Comparatively early in life Mr. Johnston became associated in the Burmantofts Potteries, at Leeds, with Mr. Wilcox, and when, within recent years, the business was converted into a company, he was appointed managing director. He was also vice-chairman of the Otley District Council. He was 63 years of age, and leaves a widow and a grown-up family.

THE death is announced of SIGNOR FIORELLI, a distinguished Italian archæologist. He was born at Naples in 1823, and from 1845 to 1849 occupied the post of Inspector of Excavations at Pompeii. When the kingdom of Italy was established in 1860, he was appointed Inspector of Antiquities for Southern Italy, and Professor of Archaeology at Naples. He was constituted in 1865 Director-General of the National Museums and of Excavations.

JOHN HENRY LE KEUX, a retired bookseller, died on Tuesday, at Durham, aged eighty-four. In early days he was a noted engraver, and worked plates for several of Ruskin's books, as well as Pugin's architectural works relating to England and Normandy. He was descended from an ancient French Protestant family, who came to England at the time of the massacre of the Huguenots.

### CHIPS.

The Library and Museum of the City Corporation is about to become the recipient of a unique collection of English and Continental mosaics, which have been made over to it by the Rev. Mr. Nelthropp, one of the Past Masters of the Clock-makers' Company.

Parliamentary powers will be sought next session to construct a tramway between Blackpool and Lytham. The line will be single, and  $6\frac{1}{2}$  miles in length.

Few special collections can rival the Avery Architectural Library at Columbia College, New York. The *New York Nation* describes the new catalogue as a "massive quarto of 1,139 pages," and states that the library contains 13,000 volumes relating solely to architecture, archæology, and decorative art, most of them, of course, being richly illustrated folios. It was founded only five years ago, and the income arising from a fund of £3,000 is to be devoted yearly to buying more books.

It has been decided to proceed with the erection of a portion of the new infirmary at Paisley. It will provide accommodation for 108 patients, at a cost of £63,457.

The Manchester City Council, on Wednesday, adopted a special resolution confirming the appointment of Mr. George Ernest Stevenson, C.E., as consulting gas engineer, at the salary of £200 a year, in addition to his present appointment of manager of the Rochdale-road Gasworks at a salary of £500 per annum.

The City Court of Common Council decided at their last meeting to increase the salary of Mr. Andrew Murray, the City surveyor, from £1,000 to £1,250 per annum.

Plans have just been accepted by the Huddersfield Corporation for the erection at Mill Hill of a hospital for infectious diseases. The hospital will accommodate 90 patients in three separate pavilions.

### COMPETITIONS.

CAMELFORD.—Architects were recently invited by the governors of Sir James Smith's school at Camelford, Cornwall, to send in designs for a school house. The drawings prepared by Messrs. Kerley and Ellis, architects of Exmouth, Devon, have been selected by the governors as being the best submitted. The architects named have received instructions to prepare the necessary working drawings and specification, and superintend the work, which will be carried out forthwith.

ECCLES PARISH CHURCH SCHOOLS.—In a limited competition for new infant schools, parish room, gymnasium, &c., the plans of Messrs. Bagot and Barlow, A.R.I.B.A., of Manchester, have been selected.

LITTLEBOROUGH.—The Littleborough school board proceeded on Thursday night in last week to select a design from those submitted in competition for a new school at Summit. The plans bearing the motto "1A" were chosen, on the recommendation of a committee, and on opening the envelopes they were found to be by Messrs. Butterworth and Duncan, South Parade, Rochdale, who were formally appointed architects for the new building at a commission of £5 per cent. on gross cost.

STALYBRIDGE NEW BAPTIST SUNDAY-SCHOOL.—The plans of Messrs. Cheetham and Barlow, A.R.I.B.A., of Manchester and Oldham, have been selected in competition.

WEYMOUTH HOTEL COMPETITION.—Mr. G. R. Crickmay, the assessor in this competition, has made his award as follows:—First award, under motto of "Coolgardie," Mr. C. Orlando Law, M.S.A., and Mr. Robt. Angell, joint architects, of Dacre House, Arundell-street, Strand, W.C. Second award, "Maltese Cross," to Messrs. Pennington and Sons, Hastings House, Norfolk-street, W.C. Third award, "Distant Shore," Mr. E. A. Lansdowne, Metropolitan Bank Chambers, Newport, Monmouth.

WIMBLEDON.—In the open competition advertised in the BUILDING NEWS for two new shops and houses to be erected on the site of Nos. 29 and 30, High-street, Wimbledon, for Mr. Thos. Oates, of that town, the design submitted by Mr. R. Allsebrook Hinds, of Hill-road, Wimbledon, was awarded first premium. Mr. Hinds has also been commissioned to carry out the works, which will probably cost about £3,000.

In the course of a few weeks the headquarters of the Order of St. Michael and St. George will be removed to the south-west chapel of St. Paul's Cathedral. The chapel is also in future to be used as a baptistry, for which purpose the font is now being removed from the nave to be re-erected at its western end.

Mr. Pritchard has just made his award as arbitrator on the sum to be paid by the Hay Urban District Council for the purchase of the undertaking of the local waterworks company. It amounts to £3,300.

The York City Council have received from the sewerage committee a statement of the amount spent up to date upon the sewerage scheme, as well as the amount estimated to be required to complete the scheme. The payments on capital accounts have been £194,997; approximate amount of balance due on contracts, engineer's commission, and of further payments for way-leaves, £2,500; city engineer's estimate of further amount required, £13,741; total, £211,438.

The seventeenth annual report upon the work of the Birmingham Corporation Fire Brigade during 1895 states that the total number of alarms of fire which the brigade attended during the year was 663, an increase of 103 on the previous year. Of the actual fires attended 458 were slight, and 33 were of a serious nature, more than one-sixth of the property at risk being destroyed. The total loss from fire was estimated at £60,290, and the value of the property at risk at £1,538,902. As compared with 1894, there has been an increase of £20,898 in the estimated loss, and a decrease of £136,660 in the amount of property at risk.

The New York Legislature have appropriated a million dollars for the building of an addition to the Metropolitan Museum of Fine Arts, and the work of construction will soon begin. Plans for the extension were made by the late R. M. Hunt, and were nearly completed at the time of his death; and his son, Mr. R. H. Hunt, has been commissioned to carry them into execution. The new extension will be T-shaped, the top of the T fronting Fifth Avenue. The design is in Classic style, and will be carried out in white marble. The Fifth Avenue front is 304ft. in length.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLI, XLII, XLIII, XLIV, XLV, XLVI, XLVII, XLVIII, XLIX, L, LXI, LXII, LXIII, LXIV, and LXV may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

A. BARROWCLIFF. (Information relating to the certificate of the Sanitary Institute may be obtained at the offices of the Institute, Parkes Museum, Margaret-street, W.)

RECEIVED.—F. Bayley.—Alpha.—J. E. and Co.—M. E.—E. S. L.—W. R. (Uxbridge).—S. B. W.

## "BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"B in a Circle," "Fae at Speda," Meaden, Clapham (no motto), "Canary," "Tadpole," "Cygnet," "Bee," "Thrush," "Venus," "Veller," "Beckington."

## Correspondence.

## BUILDING TRADES EXHIBITION, ROYAL AGRICULTURAL HALL.

To the Editor of the BUILDING NEWS

SIR,—As I am daily receiving letters with reference to the Building Trades Exhibition, which many of your readers presume will be held at the Royal Agricultural Hall in March next, I should esteem it a favour if you would kindly permit me to state through your columns that an exhibition will not be held this year. It will be continued on a more comprehensive basis in March, 1897.—Thanking you in anticipation, I am, &c., H. GREVILLE MONTGOMERY.

The International Building Trades Exhibition Co., 222, Strand, W.C., Feb. 5.

## A PETTY SWINDLE.

SIR,—A member of the London and Provincial Builders' Foremen's Association advertised lately in a trade journal for a re-engagement, and in reply received a visit from a gentleman describing himself as of Hither Green-lane, Lewisham.

After an hour's interview, an agreement was come to, and our member was to complete 24 cottages at Hither Green, six of which were partly finished. Before parting, to meet by appointment at 12.30 the following day, the gentleman, to his consternation, discovered he was without the necessary small change for his railway fare, and negotiated a small loan of 2s. until the morning. The morning's post, however, brought a post-card, regretting that being unexpectedly

called to Birmingham, the gentleman would be unable to keep his appointment, but promising to write or wire when and where the next would be. On our member hiesing himself to Hither Green, he was astounded to find that, not only was the enterprising builder unable to meet him, but that he had probably taken the job with him, as no trace of that could be found either.

Perhaps if you would be good enough to publish this letter it may prepare anyone else receiving a visit from the gentleman from Lewisham to give him a warmer reception than he may anticipate.—I am, &c., JAMES C. HASTIE.

Secretary London and Provincial Builders' Foremen's Association.  
Memorial Hall, Farringdon-street, E.C.

## Intercommunication.

## QUESTIONS.

[11477].—Momentum.—What is the momentum of a weight of 1,800lb. with a drop of 8ft. ? Also give formula.—W. D. G.

[11478].—Brickwork and Masonry.—What is required in order to pass the City and Guilds of London Exams. in brickwork and masonry ? What books must I study ? Can the papers given at previous exams. be obtained from any bookseller ? What are the first architectural books an architect's apprentice should study ? —PALLADIO.

## CHIPS.

The monument to Herr Heinrich Brugsch is now set up in the Louise Cemetery in Berlin. It is the cover of a rose-coloured syenite sarcophagus almost 6,000 years old, found in Sakkara. The toned bronze relief of Brugsch's head, and the massive iron trellis-work, silvered, which surrounds it, form a charming effect of colour. The bronze relief is the work of Max Rabe, the painter of the Orient.

Lord Grimthorpe is building at his own cost, as an addition to St. James's Church, Doncaster, a new choir vestry.

A new organ has just been placed in the parish church of D.ewsbury. It has been built by Messrs. H. Willis and Sons, of London, and cost £2,000.

After a long discussion, the London County Council resolved on Tuesday to authorise the Asylums Committee to obtain a site and proceed with the preparation of plans and estimates for a seventh asylum for pauper lunatics.

A meeting of the executive committee of the Peterborough Cathedral Restoration Fund was held last week. The treasurer stated that there was £1,914 11s. 3d. available for the west front, and £222 1s. 4d. for the north and south transepts and the eastern chapel. The Dean proposed that the necessary repair to the eastern face of the south transept and its aisle be carried out as specified in Mr. John Thompson's estimate for the sum of £499. This was carried unanimously. The Dean announced that Mrs. Argles would give, as a memorial of her son, the stall necessary to complete the number required for the choir of the cathedral. Mr. Thompson was ordered to proceed with the work without delay.

The Lord Chief Justice and a special jury tried a case on Wednesday in which the Slough District Council was sued for damages, for allowing a defective sewer to exist, so that there was an overflow of sewage into the garden of Mr. Henry Touzeau, of Spring Villa, Upton Park. Plaintiff alleged that, in consequence of these overflows, his children and servants had been ill, and he had to change his residence. The jury awarded him £250 damages.

At Wednesday's meeting of the St. Pancras Vestry, it was reported that the London County Council were likely to acquire the Highgate Hill Steep Grade Tramway, which leads to Waterlow Park, and the council asked the vestry if, in the event of their purchasing and working the undertaking, the local authority would maintain the road along which the tram ran. The vestry unanimously agreed to do this.

Sir John Ball Greene, C.B., who died on Tuesday night at his residence, Raglan-road, Dublin, aged 75, was for many years an officer in the Valuation Department, and on the death of the late Sir B. Griffith was appointed to succeed him. Under the sixty-five-years-of-age rule he was obliged to retire from the service in 1886.

The new Congregational schools, Tong Moor, Bolton, are approaching completion. Messrs. J. Gerrard and Sons, of Sinton, are the builders, and Mr. W. H. Dinsley, of Chorley, is the architect.

The Right Hon. C. T. Ritchie, M.P., President of the Board of Trade, has placed the name of Mr. Howard Chatfield Clarke, of Bishopsgate-street Within, upon the Board's list of surveyors and umpires.

## Legal.

## VESTRY BY-LAWS.

SANITATION is undoubtedly a very good thing, and it is well that sanitary regulations made in regard to buildings should be rigidly enforced. But still, it is necessary in this, as in all other things, that the law should be followed, and that zeal should not outrun not only the discretion of our local authorities, but also their legal rights and powers. In a recent case (*Times*, Jan. 23) the vestry of Fulham did no doubt exceed the authority given them by statute. Their idea was that, having got some very good by-laws made in June, 1893, under the Public Health (London) Act, 1891, it was a pity these should not be used to amend any insanitary buildings, even though they were erected long before the by-laws were made, or the Act itself was passed. Acting upon this principle, the vestry gave notice to the owner of a house in Longford-road, Fulham, to pull down and rebuild a w.c. which they thought unsatisfactory. This the owner declined to do, and a summons was issued. It was then argued for the vestry that the notice given by them under the Act was valid, and could not be inquired into by the magistrate; and, further, that as the defendant could have appealed to the County Council, he ought to have done so, and had no other remedy.

The magistrate, however, declined to have his jurisdiction to hear and decide upon the complaint disposed of in this technical way, and he held that the notice was bad, as not being in accordance with the by-laws then in force, and so he dismissed the summons. The vestry appealed to the High Court, and this view was emphatically affirmed. The judges held that as the by-laws were prospective only, they could not apply to these existing closets. It was not contended that these sanitary arrangements were contrary to any statute; but it was said that they would have been contrary to the by-laws if they had been applicable. As it was clear that the by-laws were not retrospective, they were certainly not applicable, and there was an end of the argument, and all the technical objections raised upon it fell to pieces.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

FAIRPLAY.—RATES.—COLLECTORS.—Such a mode of payment seems irregular; but I am not acquainted with the practice in this respect—with the Local Government Board, if you like.

A. B.—BUILDING.—BY-LAWS.—According to the strict term of the by-law, the words "work commenced" would seem to restrict the old regulations to houses actually begun before the new by-laws were passed. But if the Act itself be consulted, it may be that all houses which were then contracted for, and plans approved, still come under the old by-laws.

H. E. F.—CONTRACT.—LIQUIDATED DAMAGES.—I consider that in this contract the amount agreed upon as liquidated damages can legally be charged or deducted, as they can be regarded as having been expressly ascertained, and to apply to the event that has occurred.

T. A. R.—ANCIENT LIGHTS.—ANGLE.—This angle of 45° is not a legal rule, but merely a rough method of measuring. The true point is that you cannot substantially reduce the light hitherto received by the window in question, and that depends on all the facts of the case.

EXQUIRER.—BUILDING.—LIGHT AND AIR.—These holes do not seem to come in under the light and air cases, as I suppose they are all small.

On Saturday a new organ, erected by Messrs. Nicholson and Lord, of Walsall, in St. Philip's Church, Dorridge, was formally opened.

A presentation was recently made at the Great Eastern Hotel, Liverpool-street, E.C., to Mr. Charles Langbridge Morgan, on his retiring from the Great Eastern Railway to take up the appointment of engineer-in-chief to the London, Brighton, and South Coast Railway. The presentation was made, on behalf of the subscribers, by Mr. John Wilson, engineer in chief to the Great Eastern Railway, and consisted of a silver tea and coffee service and salver, together with an album, containing an illuminated inscription on vellum.

The town council of Bodmin recently decided to advertise for plans for the proposed free library; but the donor of the building fund, Mr. J. Passmore Edwards, having expressed his desire that Mr. Silvanus Trevel, of Truro, should be appointed architect, his wish has been complied with.



## LEGAL INTELLIGENCE.

**A DONCASTER CONTRACTOR'S FAILURE.**—In the affairs of Charles Sprakes, trading as Charles Sprakes and Son, builders and contractors, 35 and 37, East Laithe-gate, Doncaster, the liabilities were £2,953 17s. 7d. and the assets £720 16s. 6d. The debtor applied for his discharge on Jan. 30. In reply to the Official Receiver, he said at the time of his failure in 1892 he carried on business under the title of Charles Sprakes and Sons, but his sons were not partners with him. They worked for him, but were not interested in the business. The Official Receiver objected to the debtor's immediate discharge on the ground that his assets were not of the value equal to 10s. in the £ of the liabilities; that he had continued to trade when he knew he was insolvent; that he had contracted debts without reasonable and probable means of paying them; and that he had contributed to his bankruptcy by rash speculation. His Honour granted the order of discharge, but suspended it for two years, as required by the Act.

**CHARGE AGAINST A CARPENTER.**—On Wednesday Frederick Josiah Kelly, a carpenter of no fixed abode, was charged with having obtained by means of false pretences, from Edward Milne, a stove and other goods, together of the value of £71 15s. 9d., the property of the Economic Smokeless Fire Company, Limited, Shaftesbury-avenue. The prisoner represented himself as a practical builder, carrying on business at 158, Loveridge-road, Brondesbury, and gave orders for, and was supplied with, the goods in question, for which he never paid, but disposed of them. It could not be ascertained that any building business whatever was carried on by the prisoner. A further charge was now proceeded with against the prisoner. Mr. A. H. Kowenhoven, manager to the London Fire Appliance Company, Upper Thames-street, City, said F. J. Kelly was supplied in 1890, under similar conditions, at 184, Hornsey-road, with goods to the value of £11 10s. A further remand was granted for the purpose of identification.

**RESTRICTIVE COVENANTS APPEAL.**—**KIRBY V. THE SCHOOL BOARD FOR HARROGATE.**—In the Court of Appeal on Friday, before Lords Justices Lindley, Kay, and A. L. Smith, an appeal was heard from a decision of Mr. Justice North. The plaintiffs, the Watson trustees, were the owners of some houses separated by a road from a piece of ground on which the Harrogate School Board were erecting some large schools. Mr. Watson took a conveyance of land, including both the property in respect of which the plaintiffs, as owners, were suing, and the land on which the schools were intended to be erected, and entered into certain restrictive covenants as to the whole land. The plaintiffs sold the property on which the School Board were building to one Sampson Fox, who again sold the premises to the Harrogate School Board by agreement. The plaintiffs moved for an interlocutory injunction till trial to restrain the defendant board from building in contravention of the terms of the restrictive covenant. The restrictive parts of the covenant were not to build within 30ft. of the northern boundary of the property (except bay window and porches) and not to carry on any noisy, noisome, or offensive trade or calling on the premises. The plaintiffs contended that the carrying on a school would be within the covenant not to carry on a noisy calling, and that the building of two pentagonal towers on the northern front of the school containing windows would infringe the building line covenant. If the land had been acquired by the School Board under their compulsory powers, the plaintiffs would have had no remedy by injunction, but would, in lieu thereof, have been entitled to have any damage they sustained assessed under section 68 of the Lands Clauses Consolidation Act, 1845. The question turned upon the construction of sections 19 and 20 of the Elementary Education Act, 1870. Mr. Justice North intimated an opinion that the towers were not bay windows within the exception in the covenant, and that there was a breach of the restrictive covenant, but refused the injunction, holding that the plaintiffs' only remedy was compensation under section 68 of the Lands Clauses Act. The plaintiffs appealed. The Court now affirmed this decision, and unanimously dismissed the appeal.

**BUILDING BY-LAWS AT CAMBRIDGE.**—At the Cambridge Borough Bench, on Thursday, 30th ult., A. W. Wisbey, the owner, and Philip Banyard, the builder, both of Cambridge, were respectively summoned for erecting a cart-shed not inclosed with walls constructed of good bricks, stone, or other hard and incombustible materials, contrary to the by-laws of the borough. The town clerk appeared for the Urban Sanitary Authority, and Mr. H. H. Richardson (Richardson and Carn), of 2, Broad-street Buildings, E.C., defended on both summonses. The question of the reasonableness of the borough by-laws has been a matter of considerable agitation and discussion in the town and among the builders of Cambridge for some years past. So long as 25th March, 1890, the

Guildhall and building committee of the council reported that, in their opinion, the by-laws of the borough as to new streets and buildings required revising and amending in many instances. The report was adopted, but nothing appears to have been done in pursuance of such resolution, and at a conference of the Cambridge master builders, held on the 28th ult., Mr. G. Newman being in the chair, a resolution was carried condemning the by-laws as arbitrary and unjust, and calling upon the town council at an early date to give effect to the resolution of March 25, 1890, with a view to their amendment and revision. The building inspector, Mr. Turner, and the borough surveyor, Mr. Harry, gave evidence to show that the structure in question—a cart-shed—was built on brick foundations, but of timber, and roofed with corrugated iron. The borough surveyor was cross-examined by Mr. Richardson, with the view of showing that the structure was not of such a nature as was contemplated either by the framers of the by-laws or the Public Health Act, 1875, sec. 157, which conferred on urban sanitary authorities the power of making by-laws with respect to the structure of walls, foundations, roofs, and chimneys of new buildings for securing stability and the prevention of fires, and for purposes of health. The borough surveyor admitted that, though it was possible that danger of fire might arise, the considerations of stability or of health did not, but stated that a shed for a bicycle would come within the by-laws if they were interpreted strictly. He said, however, that the building committee were very lenient in these small cases. The by-laws were made by the late Improvement Commissioners of Cambridge on the 16th July, 1889. Mr. Richardson contended that the cartshed was not within the purview of the by-laws, and that if it were, the by-laws were *ultra vires* and bad. He quoted several authorities in support of his contention, and urged that the magistrates had first of all to decide whether the by-law was valid and reasonable before they considered the question of any infringement of them. He called the builder, who proved that he had delivered notice of intention to build and plans, but had forthwith gone on with and finished the work before receiving any notification of approval or otherwise from the borough surveyor, who had ordered him to stop the work. Mr. Richardson further contended that such an order was altogether inoperative and illegal, and that under the authority of "*Hattersley v. Burr*," 4 H. & C., 523, which decided that a person who left with an urban authority notice of his intention to build and plans of his proposed building might begin work at once, subject to the liability of having his building altered or pulled down, if not in conformity with the proper requirements of the by-laws. Ultimately the magistrates came to the conclusion that the by-law was *ultra vires*. Mr. Richardson thereupon asked for costs, as his clients had defended in the interest of the public, and the costs were allowed. The town clerk thereupon withdrew the summons against Mr. Banyard, and applied to the Bench to state a special case for argument in the Queen's Bench Division, to which application the Court acceded.

**THE THIRLMERE ARBITRATION.**—Mr. Christopher Oakley, who was the arbitrator appointed by the Board of Trade in the case of the trustees of the late Peter Todd, of Wheelton, against the Manchester Corporation, the claim being for £12,825, diverting the water and other rights in the construction of the Thirlmere aqueduct, has made his award—namely, £2,755 and costs to the trustees. The claim was for loss of water to an estate at Wheelton through drainage caused by the construction of the Thirlmere aqueduct.

**SECTION 212 OF THE LONDON BUILDING ACT.**—At the Lambeth Police-court on Tuesday, Mr. Gilbert Dunsmore, a Peckham builder, appealed against a notice of requirements served upon him by Mr. Ellis Marsland, M.S.A., district surveyor for Camberwell, in connection with the contemplated erection of some houses at Peckham-rye. The point at issue was whether the district surveyor was entitled to demand that the buildings should be erected in accordance with the provisions of the London Building Act, 1894, which came into operation on the 1st January, 1895, or whether the builder was entitled to proceed under the old Act. Mr. Rose-Innes, in supporting the appeal, said the parties were desirous of deciding what was the proper construction to be put upon section 212 of the London Building Act. Mr. Dunsmore was carrying on building operations, and, prior to the Act coming into force, Messrs. Stevens, who were the owners of considerable property at Peckham-rye, had agreed to let to him, for a period of something like 99 years, at a rental of £50 per annum, some land upon which he had now built a number of houses, and upon which he was desirous of building four more. The difficulty raised by the district surveyor was that there was no written contract between Messrs. Stevens and Mr. Dunsmore, so as to bring the case within the decision in *Tanner and Oldham*. His (Mr. Innes's) view was that it was perfectly immaterial whether the contract was in writing or not. Mr. Williams, on behalf of the

district surveyor, submitted that when the Act spoke of a contract it meant a valid contract which could be enforced between the parties. Under the Statute of Frauds a contract for the lease of land must be in writing. He contended that the arrangement between the parties was not a contract, because neither party could enforce specific performance. Mr. Hopkins came to the conclusion that the houses were being erected under a contract made prior to the passing of the Act, and discharged the district surveyor's order.

**LITIGATION BETWEEN LAWYERS ON ANCIENT LIGHTS.**—**MACRORY V. GIBBON.**—In the Court of Appeal, on Friday and Tuesday last, before the Master of the Rolls, Lord Justice Lopes, and Lord Justice Rigby, an appeal by the defendant was heard from the judgment of Mr. Justice Wright at the trial of the action without a jury. The plaintiff, Mr. Edmund Macrory, Q.C., is the owner of a leasehold house, No. 2, Ilchester-gardens, W., and the defendant, Mr. Henry Gibbon, a solicitor, is the owner of a block of residential flats recently erected in Moscow-road, which adjoins Ilchester-gardens. The action was brought to recover damages for breach of agreement and for an injunction. Mr. Macrory purchased his house in Ilchester-gardens in 1872. Down to a year or two ago there were only small cottages in Moscow-road, which in no way affected the light of the back premises of Mr. Macrory's house. The lease of the cottages in Moscow-road having fallen in, Mr. Gibbon purchased the land and proceeded to build flats on it. Mr. Macrory and his neighbour, Mr. W. B. Heath, found that part of the new buildings would seriously interfere with their light and air, and correspondence ensued. The defendant did not admit that there had been any encroachment; but ultimately, by way of compromise, an agreement was entered into between Mr. Macrory, Mr. Heath, and Mr. Gibbon, defining within what lines the new buildings, which were then in an advanced state, should be confined. By this agreement Mr. Gibbon undertook to construct a well of specified dimensions opposite to and open to the well of 2, Ilchester-gardens, the well not to be built upon and to be open to the sky, and the agreement further provided that Mr. Macrory might, if he thought proper, open windows overlooking the said well. Mr. Macrory considered that the agreement gave him a right to open windows overlooking the defendant's well: but, owing to the fact that prior to the date of the agreement a building had been erected by the defendant on the site of the well reaching to the first-floor level, Mr. Macrory could not make his proposed windows. For the defendant it was contended that, having regard to the height of the building at the time of the agreement, the agreement could not be construed so as to give Mr. Macrory the right to open windows, and that, under the agreement, the defendant was not bound to construct the well open from the ground. Mr. Justice Wright gave judgment for the plaintiff, and ordered the part of the defendant's building in dispute to be pulled down, subject to this appeal. The Master of the Rolls, in giving judgment, said that the case depended solely on the construction of the agreement. It was clear that Mr. Gibbon's building was there when the agreement was made; it was a part of Mr. Gibbon's house, and the question was whether it was intended by the agreement that that building should be pulled down. That could not have been the view of either party. The appeal, therefore, ought to be allowed. Lord Justice Lopes said that he was unable to take the same view. In his opinion Mr. Macrory had stipulated for a well to the bottom of his own ground floor, free from buildings, open to the sky, and one on which he could open windows. His opinion was formed upon a consideration of the agreement alone. He considered, therefore, that the plaintiff was entitled to the injunction asked for, and that this appeal ought to be dismissed. Lord Justice Rigby agreed with Lord Justice Lopes that the appeal ought to be dismissed. His judgment was founded on the agreement alone. Appeal dismissed.

The purchase of a building in Strathmore-road, Hamilton, for the Home for the Queen Victoria Jubilee Nurses has now been completed. The balance of the memorial fund is to be applied to procuring a marble bust of Colonel Forrest, and the committee has placed the commission in the hands of Mr. W. Birnie Rhind, A.R.S.A., Edinburgh.

A lecture-hall, vestry, and school buildings, the first steps towards the erection of an English Presbyterian church, were formally opened at Walton, near Liverpool, last (Thursday) evening. The buildings occupy a site in Rice-lane and Orrell-lane, and are English Decorated in style. The facing materials are Yorkshire parpoints with stone dressings, and the outlay has been £2,000, exclusive of site. The architect for the whole scheme is Mr. R. G. Sykes, Liverpool. The contractor for buildings erected is Mr. Samuel Webster, Bootle; ventilation and heating, George King, Limited; and furnishing, Messrs. Jones and Willis.



## WATER SUPPLY AND SANITARY MATTERS.

**CHICAGO.**—Just three-fourths of the great main drainage canal at Chicago has now been completed. During August, September, and October last there were over 8,700 men at work on the canal. The report of Chief of Engineers Randolph shows that the value of the regular and collateral work done in the period between January 1 and December 1, 1895, eleven months, is £1,200,000 sterling. The total volume of work accomplished since the inception of the project is as follows:—Glacial drift, 20,172,686 cubic yards; solid rock, 10,212,761 cubic yards; retaining wall, 97,600 cubic yards. The value of this work on regular and collateral contracts is £2,890,000 sterling, or 76·20 per cent. of the entire work done upon a basis of existing contracts.

**DROWNFIELD SEWAGE DISPOSAL SCHEME.**—A local Government Board Inquiry was recently held by Colonel Durnford, R.E., into an application of the Drownfield District Council for a loan for the purpose of sewage disposal works. Dr. Mackintosh, Medical Officer of Health, gave evidence in favour of the scheme, and Mr. George White, C.E., of Mexboro', the engineer for the works, exhibited the plans and levels, and stated that the method of purification to be adopted was that known as the International system of Ferozone and Polarite—oblong tanks with patent sludge removal apparatus. There was no opposition to the scheme.

**WORKING MAIN DRAINAGE.**—An inquiry was held at Woking on the 30th ult. by Major-General Crozier, R.E., into an application for sanction to borrow £50,000 for the purpose of a drainage scheme, and with reference to a provisional order to enable the local authority to acquire certain land required for the purposes of the works. The scheme before the inspector was prepared by Messrs. Taylor, Sons, and Crisp, of Westminster, and the details were explained by Mr. Santo Crisp, M.Inst.C.E., from which it appeared that the population to be provided for amounted to about 10,000 persons, extending over a very large area, necessitating the construction of 25 miles of sewers, whilst there were four low places in the district from which the sewage had to be lifted by mechanical means. It was intended to employ hydraulic machinery for transmitting the power, the length of mains required being about five miles. As the volume of sewage to be raised at each station was small, it was intended to use water at the comparatively low pressure of 220lb., the waste water after passing through the motors being employed for flushing purposes. The system of mains for transmitting the power would also supply several flushing stations situated upon their route, thus providing the necessary water without having to buy it for the purpose. It was intended to ventilate the sewers by means of shafts placed at suitable points, and carried up sufficiently high to admit of the sewer air escaping without giving offence, and the system was divided into sections both for flushing and ventilation purposes. The gravitation outfall sewer which drained about 90 per cent. of the area had a discharging capacity of  $4\frac{1}{2}$  million gallons per 24 hours. Upon arriving at the proposed outfall works it was intended to clarify the sewage by means of settling tanks and filters, and then to apply the sewage for final purification to land, of which it was intended to clarify  $42\frac{1}{2}$  acres. Filter presses were to be employed for dealing with the sludge, and the scheme was designed to meet the requirements of about 20,000 people, the district being a favourite residential one, and likely to grow rapidly when provided with efficient means of drainage.

A stained-glass window has been erected in the Wesleyan chapel at Epworth, in Lincolnshire, the birthplace of the Wesleys. The window is situated at the east end of the chancel, over the communion table. The subject is the Saviour's Commission to His Apostles. The window consists of three compartments, our Lord's figure, full length, occupies the central light, and the Apostles are grouped in the side lights. The window has been designed and painted by Messrs. Wailles and Strang, of Newcastle-on-Tyne.

Messrs. W. and R. Leggett, Limited, London and Bradford, have just paid their first interim dividend at the rate of 6 per cent. per annum. This company dates from July 1, 1895, has a capital of £30,000 in ordinary shares only, the whole of which are in the hands of the family and a few employees.

A faculty has been granted to refloor and reseat St. John's parish church, Hildenborough, Kent, to close the inner tower doorway from the tower to the chancel, and to open a new doorway in the tower to the north transept, to construct a passage-way from the vestry to the chancel, and to erect a new west porch. It is estimated that the alterations will cost £1,000. The designs have been prepared by Mr. F. W. Hunt, of 30, York-place, London, N.W.

## Our Office Table.

THE council of the Royal Institute of British Architects have, it will be generally conceded, made a felicitous choice in recommending that the Royal Gold Medal for the current year be awarded to Mr. Ernest George. The nomination will be as heartily approved by the profession generally as it was received when announced on Monday evening. A long and notable series of domestic buildings, beginning with Rousdon, Devon, and including in the country the mansions of Motcombe, Dorset; Poles, Herts; Woolpits and Dunley Hill, Surrey; Shiplake Court and Rosehill, on the Upper Thames; Beechwood, Kent; Batsford, Gloucestershire; and Buchan Hill, Sussex; and in London houses in Grosvenor-place, Cadogan and Berkeley-squares, Collingham and Harrington-gardens—testify to Mr. George's skill as a house-planner, as well as to his dexterity in picturesque grouping and his fresh detail, while, as the exhibitions show, he is equally facile and vigorous as a sketcher with pen, pencil, etching-needle, or sepia and water-colour brush. His *confères* in the profession so persistently treat Mr. George as a young and rising man with a promising future before him, that it is difficult to realise that he is in his fifty-seventh year, yet a generation has passed away since on the completion of his articles with the late Samuel Hewitt of the Adelphi, he entered into partnership with Thomas Vaughan, also long since deceased. A portrait of the Gold Medalist nominate was published in our issue of Jan. 3, 1890, and most of his more important works have been illustrated in our pages.

"THE Garden in Relation to the House," was the attractive title of a paper read by Mr. F. Inigo Thomas, before the Society of Arts on Tuesday evening. The chair was occupied by Mr. T. Graham, A.R.A. Mr. Thomas, whose paper was illustrated by numerous lantern slides, expressed the belief that as a nation we were beginning once more to realise the charm of a formal garden. We were commencing to infuse a breath of life into some of our buildings, and it was natural that the growth of interest in the direction of architecture should be accompanied by a wish to give the buildings some proper and dignified setting. Giving a history of garden architecture of old, Mr. Thomas pointed out that old gardens were divided into several departments, and each of these bore a character distinctly its own. Passing on through the development of the pleasure grounds of old, he suggested that the period of greatest activity might be placed in the reign of William and Mary. Following a description of some Italian gardens, Mr. Thomas proceeded to give his idea of how a garden should be made in these days a proper adjunct to the house. It was well, he said, in choosing a site to depend more upon the masses of foliage which always existed than on what was proposed to be planted. But the difficulty was that the idea existed that a different hand was required for the grounds to that which designed the house, and further that it was time enough to consider the grounds when the house was finished. He contended that if an architect had such a limited experience of country life that he could not be intrusted with the grounds, he certainly would not be competent to design a living home in the country, and that to place the whole of the designing in the hands of one individual was the only means likely to result in a harmony.

A CONFERENCE to discuss the wanton defacement of scenery, organised by the National Society for Checking the Abuses of Public Advertising, was held on Friday afternoon at the rooms of the Society of Arts, Adelphi. Mr. Alfred Waterhouse, R.A., LL.D., who presided, remarked that, as the population increased in density, it behoved the community to guard natural beauties most jealously against destruction and degradation. Enormous and gaudy posters, which rendered it impossible to appreciate the beauty of adjacent architecture, the shrieks of the newspaper boys, the foolish repetition of identical enamelled plates were amongst the matters which they should do battle with. Sir Lepel Griffin moved:—"That it is a national interest to protect rural scenery from unnecessary disfigurement and to maintain dignity and propriety in the aspect of our towns." Mr. William Morris seconded the motion, and remarked that the growing disfigurement of rural scenery was a very serious evil indeed. It was a fact that the

majority of the people of the country were without eyes in this respect, and it was, therefore, a very difficult thing to mitigate the evil. Public opinion must be slowly built up on the matter. The resolution was unanimously adopted, and it was further agreed, on the motion of Mr. W. B. Richmond, R.A., seconded by Mr. M. Crackanthorpe, Q.C., "That this meeting, impressed with the serious injury done by the practice of indiscriminate spectacular advertising, regards the Rural Advertisements Bill, which was brought in by Mr. Bouverie in the Sessions of 1894 and 1895, as a measure of urgent importance, and commends it to the good will of the new House of Commons." The report of the society was adopted on the motion of Messrs. Humphrey Ward and St. L. Strachan.

MR. ARTHUR E. COLLINS, city engineer, Norwich, has sent us a tabulated list of questions which he sent to 54 towns, relating to the use of tarred macadam, and the answers received. The statement shows that tarred macadam has not been laid to any great extent, and in some towns only experimentally. As to its duration, only a few towns have used it for any length of time. It compares favourably with ordinary macadam. Hull is an exception. At Bristol, where it has been used to a small extent for suburban roads, the reply is that when laid down in streets of heavy traffic it "was worn in holes in two years, and replaced by wood-paving." At Cheltenham, the tar macadam has worn from twice to four times the life of ordinary macadam, and the maintenance in many cases is less as regards cost. The answers as regards annual cost of maintenance per square yard vary. At Croydon the cost per yard is said to be 9d.; but in most towns no account has been kept. Various are the kinds of stone used—mountain limestone, whinstone, granite, gravel, flints, are enumerated. At Darlington whinstone is used, and it is stated that where traffic is not heavy the cost for both maintenance and scavenging is much less than that of ordinary macadam. The general opinion seems to be that it is not suitable for heavy traffic. At Leicester it is used for streets with light traffic only, and is said to be dangerous in frosty weather. On the whole, no very definite opinion as to its durability or advantages can be gathered from the replies.

THE first of the spring exhibitions to open in Scotland was the Glasgow Institute of the Fine Arts, of which the public view took place on Monday. The number of works which have been hung is 885, consisting of 578 oil-paintings, 152 water-colours, 98 architectural drawings, and 57 pieces of sculpture, the total being about 170 more than last year; and the council rejected more pictures than they have accepted. The display is a strong one. The loan exhibits include; Watts's "Young Man with Great Possessions," "La Princesse de Porcelaine," by Whistler; Lady Butler's "Morning of Waterloo"; a group of "Children with Flowers," by Joseph Israels, and works by J. F. Millet, Maris, Diaz, Corot, Isabey, and other French artists. The portraits are grouped together in the third gallery, and include Sir George Reid's portrait of the Rev. Dr. Donald Macleod, and canvases by James Guthrie, C. Lavery, Arthur Melville, and Harrington Mann. The chief Impressionist examples are contributed by Hornel, Oppler, and Henry.

MR. JAMES PATON, curator of the Glasgow Museums and Art Galleries, has just issued his annual report, in which it is stated that, in addition to the Kelvingrove Museum and the Corporation Art Galleries, the city now owns the new Camphill Gallery, while there are in course of erection, winter gardens in Glasgow Green, and the new art galleries and museum building in Kelvingrove Park. It is expected the winter gardens in the Green will be open for occupation in the autumn of this year. Donations had been brought or sent to the museum from every part of the world, and purchases had been made on an extensive scale, resulting in valuable collections of carvings, Oriental textiles and pottery, ancient and modern glass, iron, and other metal work being added to the Museum—all works of the greatest utility to designers and to workers in the various media represented. The art collection had been strengthened in its modern department during the year by the purchase of Colin Hunter's "Good Night to Skye" and J. E. Christie's "Vanity Fair"; and the collection of old Dutch masters had been enriched by the addition of a sea piece by Ludolf Bakhuizen. Several paintings and works of sculpture had also been gifted.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### CAN THE CONTRACT SYSTEM LAST?

ALMOST every week one thing or another connected with the building trade suggests this question. It came up in formidable guise during the controversy between the Institute and the contractors about conditions of contract. It reminds us once more of its existence in the complaints just made by the Institute of Builders to the London County Council; and that it is making itself heard in Scotland as well as in England is clear from the very practical paper read a fortnight ago by Mr. A. Muir at the Glasgow Building Trades Exchange. There is no doubt that honest builders find it harder and harder to hold their own. They are ground down by the public, who think of nothing but cheapness. They are undersold by unscrupulous competitors, who tender at losing prices, and whose losses finally fall on their timber merchants, brick merchants, and other vendors of materials. They are vigorously attacked by their workmen, who, like the rest of the world, are trying to do the best they can for themselves, and who sometimes try it in ways which threaten to destroy the very industries on which they depend for their living. We need not wonder, under these circumstances, if their masters look back with regret to the good old times of "measure and value," and hold in little honour the memory of the enterprising men who first undertook to say beforehand the exact sum which a building would cost.

The contract system pleases no one but the public. And it only pleases them till experience shows them what it really is. They think—or at least the fresh and innocent amongst them think—that when they once have a signed and stamped agreement for a building, that building will cost just what the agreement says, and no more. Some wiser neighbour hints at "extras"; but they look to their architect to keep them safe from these. They shall order none, and obviously, therefore, they will have to pay for none. They advertise for tenders, and take the lowest. Then their course of illumination begins. The builder who is accepted may be a well-meaning one, or he may be an intentional cheat; but, in either case, he must live. The difference is, that if he has no character to lose, he will try all the tricks of the trade in hopes of not being detected; and that if he has a character, he will look through every clause of the conditions, and watch every incident that happens, that he may find some door of escape. Mr. Dodge will make his concrete with chalk-lime and half-burnt ballast. He will run up his walls with place bricks and shuffs, set in road-scrappings and mud, and provided with as many "pockets" as circumstances allow. He will construct his floors and roofs of unseasoned stuff, full of sap, shakes, and large and loose knots; and will reduce the scantlings to the point which, as a "practical man," he considers sufficient for safety. In like manner he will exercise his own judgment about the lap of the slates, the thickness and width of the flashings, the quality of the sand and the quantity of hair in the plastering, the weight of the window-glass, and the number of coats of paint. If the architect is wide awake, of course he and Mr. Dodge will have frequent differences of opinion. But the latter gentleman will attempt to get the employer on his side, and will very likely do so, so that he will look on the architect as an oppressor, and on "poor Dodge" as a cruelly-treated man. The employer, it is true, will not pay

Dodge any more for this. He will give him his sympathy, not his cash. But when conscience tells him that he never ought to have accepted a contract at the price, he will remind himself—if he can—that the price was about that of the architect's estimate; so that the architect is really the only person to blame.

Perhaps, however, it is Messrs. Wrangle and Wrangle who have the building in hand. They are an important firm, with a high reputation; but they do not like losing money, any more than their humble fellow-tradesmen, although they provide against the loss in quite a different way. They look through the drawings, quantities, and specification with what Sam Weller called "a 40 million-power patent gas microscope." They keep the sharpest of sharp clerks at work, comparing every detail, as it arrives, with the general drawings, and the other particulars from which they tendered. If the detail shows less work, they bear it meekly, patiently, uncomplainingly; if it shows more, they instantly book it as an extra. In the former case, the architect never hears of it at all; in the latter, he is not told of it till the final accounts are made up. Then comes a long string of complaints. The architect ordered this, that, and the other; in fact, the whole building ought to be measured up, from beginning to end. "Then why did you not tell the architect at the time, so that he might have avoided all these extras?" "Oh, we thought he was busy, and we did not like to trouble him." But the firm have no compunction about troubling him at the end. If he has been specially careful, and the extras are few, then they go on some other tack. The employer delayed them; he did not chose the stoves and mantelpieces in time; or the architect delayed them; they could not put in the footings, because he did not send a full-sized section of the gable copings sooner. Perhaps he specified a brick which they had to wait for, or a stone which could not be got when Messrs. W. and W. ordered it (three months after they might have done), because the quarries were then flooded. Then the gas-fitter wanted their scaffolds kept up, and the decorator whom the architect employed did not finish as soon as they were themselves ready to finish, and so they were delayed, and sent in a claim of £500 or £1,000 for compensation. In this way, and in other ways too numerous to mention, Messrs. Wrangle try to get their money back, and generally do it. Their perpetual cry is, "Arbitrate, arbitrate, arbitrate," and though the sound might satisfy the Peace Society, there is little peace indeed for anybody who has to do with them.

No architect can hold his clients harmless from such people. But of course it is the architect, and not they, who gets the blame with the public. And all the while the heaviest blame is due to the public itself, or to those short-sighted and greedy members of it who knowingly accept tenders which it could never pay to execute. They think they are going to get the best of the builder; and they are rightly served when the builder gets the best of them, as he nearly always does. Yet they are too dull to learn by experience. Remembering that the amount of the last tender they accepted was no guide whatever to the sum they had to pay when the contract was finished, they still hope that this will not be the case again. They will get a fresh architect, and a more business-like one. They do so, with the same result as before. But the wish to get a shilling's-worth of work for sixpence is still uppermost in their hearts; they still play the old pea-and-thimble game with their contractor, and they still find, time after time, that the pea is not where they thought it was. So they grow old and die, and their sons carry on the same foolish speculation. Is it likely, they might surely ask themselves, that it could often succeed?

Is it possible that one of the most important industries in the country—the industry of building—could permanently go on at a loss? Is it not obvious that when they try to get their houses and offices and churches "run up" below cost price, that the men who run them up will be forced, by the mere instinct of self-preservation, to devise all the schemes they can think of to get their money back again? And, if this is so, would it not be a simpler, more honest, and altogether more satisfactory plan to do away with lump contracts altogether, and to have the work which is actually done measured and valued at a previously agreed-to schedule of prices?

### METHODS OF BUILDING.

THERE are generally two ways of doing a thing—one easy and inexpensive, the other difficult and costly; there is also a right and a wrong way, a positive and a negative. Architects and builders are both addicted to adopt one or the other of these courses in their work; for obvious reasons the former takes a more positive view of his art than the builder, who is generally the contractor. As might be expected, the architect usually selects the most attractive and costly way. If there are two ways of designing an elevation, he generally takes the most laborious; whether it is better or worse is another question—it is the way which gives most trouble. The architect is addicted to ornament, to an excess of detail. In some buildings this elaboration is excusable, even right; in others, as in a warehouse or factory, ornament would be clearly wrong. Extremes are often to be met with in architecture, as in other things, politics, theology, art; but it is necessary to recollect that two extremes do not make right—they are both errors, one in excess and the other in defect of the central truth. We do not get the truth by adding together and dividing by two. Thus it is as easy to spoil a building by too much ornament or enrichment as to denude it of all appropriate relief. One is as absolutely wrong as the other. But it is not a question merely of more or less ornament or detail that makes a design for a building right, just as a cook flavours a dish, but whether the design and ornament and detail are appropriate to the work. Exaggeration and defect are the Scylla and Charybdis of architecture; but for some reason the designer falls into one or the other of these extremes. Either of them seems easier than pursuing the true course.

Right and wrong, easy or difficult, inexpensive or costly methods of carrying out buildings are exemplified more, perhaps, in the practical operations of the artificer. On these grounds the training and education of those who superintend the execution of work and direct the workmen employed are not regarded with sufficient attention. The selection often depends on the architect or builder—his knowledge of a particular trade, expertness with tools, or being conversant with cost of labour. As the method of setting out and executing work is often left to the builder's foreman, his place and function in building operations are important. He should not only have skill of hand to be able to execute any piece of work in his particular trade, but be conversant with other trades. Mr. G. Barclay, in his useful paper read before the Provincial Builders' Foremen's Association the other day, ran through those trades from which this useful functionary should be drawn, and we do not think he was wrong when he selected three of the trades—the bricklayer, mason, and carpenter—as being the most eligible for the post. Out of these three, the carpenter and joiner is considered the most competent for the task, because he has a more general technical acquaintance with the requirements of the other two and of all



other trades. Very little can be done without his help; he possesses a general mastery of that supreme initiative process known as setting-out work, he can use his pencil, he knows something of practical geometry and the projection of solids, and is, therefore, able to set out the curves and moulds for bricklayers' and masons' arches and groins, to help the plumber in laying gutters, forming drips, &c., as well as to arrange the more difficult work in his own trade, such as sash-frames, carved and bevelled work. Of course, there is such a thing as a craftsman over-estimating his particular trade. A carpenter and joiner has sometimes preferred to carry out a piece of work in timber or woodwork which would be better executed in brick or stone, and we all know that the carpenter's idea of Gothic was by no means the one to be followed. Half the battle of execution is in being able to set out work to determine the mode of doing a thing which will produce the most efficient result, and a competent foreman is a guarantee that this is done.

Unlike the architect, the builder is generally inclined to take the easiest and quickest mode of executing work, to cut down ornament and expense; but he is often as wrong. The builder adopts the easy and simple mode, not because it is suitable or appropriate, but to save expense. Just as the one extremist piles it on, the other robs the work. We hear people talk of a builder's design, that it is practical and simple, without pretence or ornament, and is cheap compared with the architect's. But is it, for all that, convenient, or suitable, or appropriate? This is the question to decide before an opinion can be given. Its very so-called simplicity and cheapness may be a snare, and conceal a multitude of defects. It may be even costly in the long run. Is it not possible that, in simplifying the plan, convenience or comfort has been lost? That, in adopting easy lines and cheap construction, real economy and comfort have been sacrificed? Simplicity is not always equivalent to cheapness in the architect's vocabulary; but it is often supposed to spell the same by the contractor. A few practical examples will show us more as to what the easy and cheap method is in modern building. No one will deny that there are two or more ways of building walls of stone and brick. There is a rough-and-ready method, and there is a skilled way. The easy-and-rough mode of constructing stone walls is that of selecting stones pretty much at random. Let us look at the workman on a rubble-faced wall. He disregards the size of his stones, or their shape; he does not study his backing; instead of firmly bedding the smaller stones with thin joints, he throws them in on soft mortar; the stones of the backing, instead of being brought up to courses at frequent intervals, are left to long intervals of the facing of coursed rubble; he seldom inserts bonding stones to tie in the facing and backing. The result is, that in a short time the rubble backing settles down, tearing itself away from the coursed facing, and the strength and cohesion of the wall is destroyed. The rough-and-ready mode of bricklaying is the same; bats are used instead of whole bricks, the bond is ignored, the courses are not kept, and mortar takes the place of skilful laying. In walls of two to four bricks in thickness, it is of importance to have raking bonds, and the alternate courses should be laid in opposite directions, to make the tie as strong as possible; but how little is this rule followed? The man who takes the easiest course is not likely to look after the bond, or the junction of cross and main walls, so as to obtain a lap, which he can only do by using a "closer" in every alternate course.

Does labour-saving imply bad work? It may not always be the best way of doing work, nor, contrariwise, is it neces-

sarily the worst. It all depends on the motive which controls it. If it is to cheapen the work, we cannot say much for it; but if directed by skill and to simplify operations and economise material, as in the proper use of labour-saving appliances, it may become a real benefit. We must judge of joinery on this principle. Many admirable labour-saving machines are now used in modern building. Machine-made joinery has no doubt done much to transform the joiner into the wood-fitter, as it has done in America, one object being to save skill in adaptation; and the art of joinery has suffered no less than the trade itself. Why is this? Is it not because the mechanical methods have been used to supersede manual skill? When these machines were brought out, the main object was to simplify the conversion of timber, to save labour in sawing, planing, moulding, shaping, tenoning, grooving, and other processes. But in the course of time those machines began to suggest a quicker and easier mode of doing the work, and machine-made joinery was introduced to supersede purpose-made joinery. This was an undeniable gain in many ways, as it not only reduced waste of material, but cheapened joinery for purposes where a large number of articles like windows and doors had to be turned out. On the other hand, the machine joinery of the workshop has superseded the actual joiner's work on the building, and he has now merely to fit and fix what at one time he set out himself and executed in contact with the actual structure. No one, except the contractor, will deny that the art has lost its charm by this change, or that the best mode of execution has given place to the easiest and the cheapest.

It is the same with other trades. Take the plumber—a practical authority has said that some "buildings are now executed almost without the presence of a bit of lead." Formerly no architect specified anything else but lead for flats, gutters, and pipes; but now we find iron pipes everywhere superseding lead, and the smith taking the place of the plumber. Plumbers' fittings are largely giving place to goods supplied by the ironmonger, and it was proved by the evidence taken before the Select Committee on the Plumbers' Registration Bill, three or four years ago, that the ironmonger does a very large amount of the work that should be entrusted to experienced plumbers. In fact, the disrepute of the latter class has been mainly brought about by the inferior work of so-called "three-branch hands" employed by builders, men who do, besides their special ironwork, a little gasfitting and hot and cold-water fittings. Like the deterioration which has gone on in the bricklayers', slaters', and carpenters' trades, the whitesmith now does not only iron-pipe, but lead work also. The question with the average modern plumber is not, How ought such and such a piece of work to be done to make an effective job? but, How it can be done to answer the purpose at the least expense of labour and material? In this branch of skilled labour there is perhaps a greater opportunity for doing a thing as it ought not to be done than in almost any other trade. How much can be done in this way in lead-laid gutters, working down drips, in forming "splash laps," cutting step flashings, and other details of lead-laying? Given two ways of laying a gutter or covering a dormer in a mansard roof, the average contractor will be sure to do it the way that saves lead or labour, even if it be to save a welt, an "apron," or "tacks." Indeed, a speculative builder's specification would pretty fairly describe work as "how not to do it": it is seldom he takes the alternative plan from any other choice than that of saving trouble and expense.

Of two ways of doing a thing, he will generally accept that which is the easiest

or quickest; he will not trouble himself to inquire which is the best or most artistic. It has been said, moreover, that the certificate is no guarantee of good workmanship—the standard by which the plumber is judged. In these days, when most of the building trades are recruited from all ranks, and learn their vocations on the "pick-up" system, and receive their directions from foremen, it is impossible to expect that right methods should be followed. Examinations may do something in this direction, but not all. The artistic method is generally the last to be learned—a fact which no one can deny who compares the leadwork of the 13th and the 16th centuries with our own. All kinds of technical methods, good, bad, and indifferent, are acquired; but the architect's way is somehow never learned. The best that is sought to be done is to avoid mistakes; but the positive side of truth still remains in abeyance. We want men who, while they avoid faults and defects, are still able to take a larger and more independent view of the mode of working—who can select the right method because it is the truest and best, or the simplest.

## COUNTY LUNATIC ASYLUMS.—XXXIX.

By GEORGE H. BIBBY, F.R.I.B.A.

DISTRICT ASYLUMS AT HOME AND ABROAD.

ABOUT one mile and a half from the centre of Munich is situated the large asylum shown upon the block plan in Fig. 61, and which I am enabled to give, with other plans, by the courtesy of the director of this Royal institution. The general arrangement is symmetrical; the gardens and airing-courts are rather elaborately laid out with fountains, arbours, shelters, and shrubs, while pathways are arranged in all directions, and the utmost use appears to have been made of the somewhat limited extent of the asylum estate.

Two of the inner courts on both male and female sides of the asylum are also laid out for the purposes of the exercise of the patients; but (surrounded as they are on all sides by buildings) they would not be so advantageous as the outer grounds for the purpose.

The administration buildings occupy the centre buildings, while the male patients are located to the east, and the females to the west; the day and single rooms are, for the greater portion, arranged with external aspects to the south, east, and west; but there are a few which have the windows with a prospect only towards those inner courts to which I have referred. The closets and bath-rooms are all arranged within projecting buildings; but these are not provided with the isolating or ventilating corridors found in most modern English asylums, neither does the arrangement afford a quite satisfactory means for keeping the patients under observation. A considerable area on the basement level is occupied with an elaborate system for heating and ventilation. This must have been very costly in execution; indeed, the whole of the basement works appear to be of a very substantial character, with vaulted roofs, and walls of considerable thickness. In modern English asylums it is usual, so far as practicable, to keep the levels of each floor upon one plane; also, to avoid steps in the passages, winders in the stairs, and corners or recesses which might be used by the patients for escaping observation. But in this asylum at Munich it will be noticed that these are points which have either been disregarded, or have, from circumstances, been unavoidable.

The staircases at the Munich Asylum are very numerous, and well placed with the view of convenience to the officials, and separation of the different classes of patients; but several of them have a number of winders in each angle, and may be nearly as dangerous for the officials as for patients.

This asylum at Munich is conducted upon the most modern scientific principles. From 1889 to March, 1893 there were 336 post-mortem examinations undertaken in the customary German manner. The laboratory accommodation is said to be good, but not what could be desired. Microscopical examinations are made, and specimens kept. Doubtless there is much pathological research to be





made on the question of insanity, and such study would promote better means of treatment. Upon the whole, it would appear that German and English asylums are not unlike in respect of the necessity for better (and special) laboratory accommodation than is at present usually provided for by the architects concerned with such buildings.

German architects are in agreement with English architects as to the desirability of planning asylums upon a more liberal system than was formerly thought necessary, and anything resembling the old prison-like form of asylum is considered quite out-of-date. Imprisonment in any form brings into simultaneous action many influences which are very dangerous to mental health: remorse, longings, concentration upon one small circle of ideas; sometimes the inability to take adequate nourishment, and the want of sufficient exercise, &c. Indeed, in houses of correction, both here and abroad, the number of instances of mental disease has been found to be relatively greater than amongst the free population; but the majority of these cases should certainly not be entirely ascribed to the imprisonment. Frequently the individual is already very strongly predisposed, and often the disease is even more than half developed before he is put into prison, inasmuch as during his previous life the criminal has sometimes been particularly exposed to the influences which contribute to insanity. Thus the inner prison-like courtyards of the Munich Asylum for the Insane (although carefully laid out and utilised to the best advantage, so far as the limited area permitted) are obviously less suitable for the exercise of patients than would be outer airing-courts, and even these are better arranged when with open iron railings (unclimbable) than with high brick or stone walls.

The great portion of the Munich asylum consists of basement, ground and one upper floor;

but there is a small second floor above the central main entrance. This arrangement of not placing insane patients upon a higher level than the first floor is generally recognised in this country as

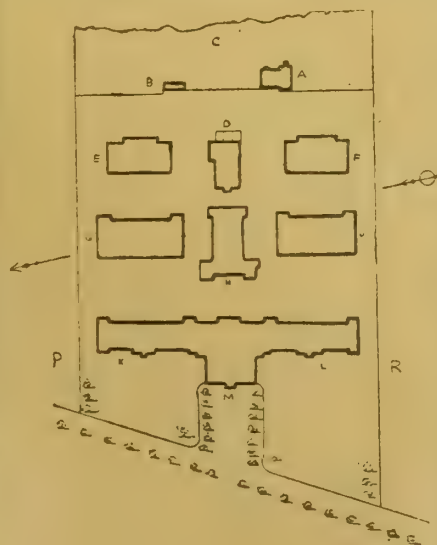


FIG. 62.

being advisable; but it is necessarily more expensive as regards the cost of the buildings.

Upon the first floor, in a central position, is the asylum chapel, with two staircases, each, un-

fortunately, with many winders in its course, and it would not be difficult to imagine that, in the event of a fire or panic, a congregation so situated, sane or insane, would be placed in a position of great danger. The chapel would have been better placed if on the ground floor. In many other respects the plan of the first floor is exceedingly good. The principal rooms are arranged with exits at each end leading to the numerous staircases; but, on the other hand, there are disadvantages in placing the closets in sanitary annexes which can only be reached by crossing the long corridors, for the difficulties of keeping patients under close observation are thereby greatly increased.

Another German arrangement of an asylum plan is upon the villa system, in which a number of entirely detached buildings are provided, the unoccupied land being laid out as pleasure and garden ground. Such an arrangement is provided at Halle, and is wholly unlike that at Munich; it is the asylum for mental and nervous patients attached to the University of Halle, and consists of a number of detached buildings erected upon a rather limited area of ground, which, however, is utilised to the utmost for the purpose of gardens and airing-courts, &c., as is the case at Munich.

This asylum was built according to the directions of Professor E. Hitzig, the medical superintendent, upon a site of about five English acres, which cost 125,000 marks. Professor Hitzig, under whose directions the asylum at Halle was erected, has expressed an opinion adverse to asylums built like military barracks, with long corridors and rows of rooms. He is in favour of the villa system, and attaches great importance to arrangements which shall house the patients separately, as shown on the block-plan in Fig. 62.

A detailed description of the asylum at Halle, which is of interest, and more hospital-like than



the ordinary English asylum, will be given in a further paper, together with plans and sections, which have been supplied to me by the courtesy of Professor Hitzig, to whom I am also indebted for many interesting particulars on the subject of asylum construction in Germany.

(To be continued.)

#### DUDLEY GALLERY EXHIBITION.

THE Dudley Gallery opens with a few water-colours of exceptional merit amidst much that is commonplace and below criticism. "Impressions" are by no means aggressive—in fact, there is little that any admirer of the traditional schools can find fault with; on the contrary, the fidgety style of execution has still away, and no doubt commands a market among the average picture-admiring public. One of the leading members, Miss Evangeline Jex-Blake, has half a dozen very admirable water-colour sketches in her broad, incisive manner, natural, and full of light and colour. The first we come to is her "Wells Cathedral" (47), a view from a meadow on the south side. But her principal studies are on the end wall, and are sketches of landscape, "The Old Inn Bridge" (114), "View of Mont St. Michel, Brittany" (117), "Church and Calvaire, Brittany," "A Quiet Evening Near Christchurch" (131)—all of them broad in handling, fresh in colour, and sympathetic. Sir William Eden, Bart., sends a few vigorous sketches of landscapes in simple washes of colour, of which we may single out "Maple Durham Mill," "In the Woods, Windlestone" (135). In the centre of same side of room the president, Walter Severn, sends one of his best works, "White Arch, Anglesey" (120), a remarkable conformation of pipelay rock with a natural archway between abutments of the solid rock, which juts out from the coast. The painter has felicitously depicted the delicate white crest with its smooth, wave-worn texture surrounded by the blue sea, with the Holyhead hills in the distance. A companion picture (187) represents a remarkable stratified red sandstone cliff, "Smugglers' Caves," on the Berwick coast. The bold outline and tilt of the rocky headland and its warm red colour make a striking contrast to the white Anglesey reef, and Mr. Severn is here seen at his best in this bold rendering of coast scenery. A little sketch by David Green, "The Top of the Hill" (123), may be noticed for its handling of colour, distance, and cloud, in which, by a few skilful touches, a definiteness of suggestion is given to the brow of hill. The president's "Golden Wedding of a Silver Birch" (56), by the side of a rippling river, is delicately painted; but it is far less successful than the coast views we have noticed. One of the cleverest works is John Blair's "Storm and Sunshine, St. Abbs, on the Berwickshire Coast" (156), a powerfully-handled coast view, with the nestling little harbour under a stormy sky; a break of sunshine lights up the landscape with its glittering sea, and it is this effect which the painter has portrayed with singular effectiveness and technical skill. Breadth of handling and the dark masses of cloud and shadow impart a poetic charm to the scene. A very able study of Chartres (178), by Robert W. Allan, in his singularly brilliant manner, must be noticed. The details and the group of figures in the foreground are put on with his decisive touch and breadth. The handling is even more telling than Prout's. Chas. J. Adams's "Arundel" is a spirited sketch of the church on its elevated site above the water meadows, and his other works, "In the Strawyard" (54), "A Sussex Farmyard" (206), &c., are all in the same broad style. Few figure-studies can equal Maude Turner's "Sketch in an Italian Church," a little thurifer in scarlet cassock and cotta carrying a censer (163). The same artist sends "A Modern Cinderella" (88), and one or two more clever figure sketches. F. G. Coleridge has a highly-finished landscape, "Dittisham on the Dart" (175), delicate in its handling, with stippled effect of water and trees; his other contributions are cold in colour. Subtle in tone and in the misty vapour and sunlight are the delicate glacier studies by B. J. M. Donne. The beautiful, soft, silvery tones on the "Vuibez Glacier from the Bertol Slopes" (84), and his "Tranquil Day in the Caverns of Beer" (171), are rendered with the painter's delightful mastery of atmosphere and light. Mrs. Mary Stevens is charming in her spring-like landscape study, "In the Engadine" (67), and in the vigorous limning of the wild flowers and weeds in the foreground. Amongst

the few figure studies, the small cabinet, "An Idyll of the Campagna" (185), by that able Italian painter, A. Stoppoloni, must be mentioned for the beautiful figures of the cherub-like boys gambolling in the rear of a plough. For movement and grace and exquisite finish this little work is remarkable. Miss Margaret Bernard shows simple, broad, unaffected handling in her "Holt Farm, Wimborne" (9), her "Gateway, Brittany," and other sketches in the same district. Percy Dixon sends a delightful sketch of a sea-girt bay, such as we see on the east coast (20), with its nestling village of red roofs. Agnes Rudd has a pleasant sketch of "Christchurch, Hants" (33), and F. Burgess, Chas. J. Adams (206), Montague Smyth, David Green, C. Topham Davidson, Frances E. Nesbitt, Nora Davison, have contributed interesting works. David Green's large drawing, "Between the Showers" (65), is a delightful study of atmosphere—a mountain road, cut in the rocky cliff, with cattle on brow of hill, and its hilly background. His "Whitby Market" (95) is also an able colour study of a stall. There is much that is commonplace in drawing and sentiment on the walls which would have been better unhung.

#### THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of this association was held on Friday evening, Mr. F. T. W. Goldsmith, A.R.I.B.A., vice-president, in the chair. The following three new members were elected:—A. E. Corbett, E. W. Sloper, and Henry Tanner, jun. The chairman announced that the following new classes were about to be started:—Materials, by Professor Kerr, on Tuesdays, at 7 p.m., commencing Feb. 11; Design, by Mr. A. Beresford Pite, on Mondays, at 7 p.m., commencing Feb. 17; and Construction, by Mr. F. R. Farrow, on Thursdays, at 6.30 p.m., commencing Feb. 20. Mr. SIDNEY H. WELLS, principal of the Battersea Polytechnic, read a paper on "Technical Institutes," illustrated by numerous plans and working drawings. The lecture is given *in extenso* on p. 234.

Mr. E. W. MOUNTFORD, in proposing a vote of thanks to Mr. Wells, observed that the paper would form the nucleus of an admirable treatise on the subject, for it was the first attempt to put into practical shape the requirements of this important class of buildings. The information could not have been given in better form, and it was founded on the experiences of the principal of one of the largest institutions of the class. Mr. Wells had learned by painful trial the shortcomings of the building in which he worked, and how its defects could have been rectified. Many of the difficulties felt in working such institutions were due to the vague instructions issued to competing architects by committees who did not know what accommodation was required. One point which was always insisted upon was the provision of separate entrances and of separate classrooms, social and refreshment rooms for men and women, which were, as Mr. Wells had shown, quite unnecessary. He should like to know whether, given an unlimited area, Mr. Wells would prefer an institute spread out on one floor, or arranged in two, three, or four stories. He must differ entirely from the lecturer's desire to place all corridors next to the external walls in order to shut off street noises from classrooms. In the first place, the corridors would be needlessly long, and, therefore, wasteful of space; then it would be almost impracticable where the buildings surrounded a quadrangle and the effect architecturally and lighting of external corridors would be bad. The information given as to the relative sizes and positions for workshops and classrooms for various trades was of great value; the architect needed to remember that special provisions as to space needed to be made for each trade. Emphasis should be laid by committees in issuing instructions on the importance of keeping the cost of maintenance down to the lowest point, and especially the item of attendance. This was the crux in London institutes, for while by special effort money could generally be provided for building such polytechnics, it was not so easy to meet the working expenses, and over at Battersea these amounted to £10,000 a year. Those who entered into competitions for this kind of building found that the sizes of apartments scheduled for classrooms were generally ridiculously large. The best place for music classes was in the central hall, for under the London County Council regulations this

had to be so isolated as to be practically out of sound of other portions of the building.

D. KIMMINS, Secretary of the London Society for the Extension of University Teaching, in seconding the vote of thanks, observed that the lecturer had been so delightfully orthodox throughout his paper that it was impossible to discuss it. He concurred in Mr. Wells's suggestion that small as well as large lecture-halls should be provided. He thought rooms for advanced laboratory practice would be more and more needed in Metropolitan institutes.

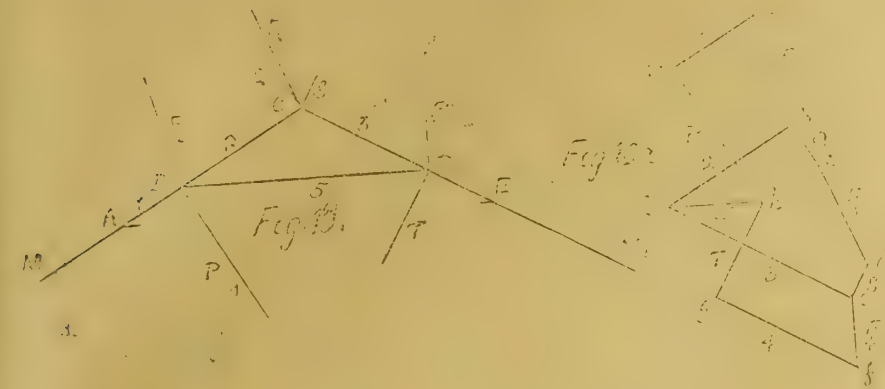
Mr. SIDNEY BEALE said his experience was that competitive conditions for technical institutes were left very vague; often the competitor had himself to apportion the relative number of students attending the various classes, and, therefore, the information given by Mr. Wells was most valuable. He doubted if drawing could be carried on in a room in which workshop practice was in progress. The problem of lighting the large lecture theatre was a difficult one. The width of this hall should be from 30ft. to 35ft., and it should be provided with tiers of seats accommodating from 200 to 250 students. At Battersea Mr. Mountford had kept the windows above the seat level, one result being that the height of walls was greatly increased, while at the Chelsea Polytechnic Mr. J. M. Brydon, probably in order to reduce the cubical contents of room, carried the benches across the windows, which was not according to architectural rule. In any case the entrance should not be near the lecturer's table, as should any students come in late the teacher would be disturbed; where the space could be afforded, an entrance should be made at the back with a gangway behind the seats. To provide corridors next external walls of classrooms, as advocated by Mr. Wells, would waste so much space as to be impracticable. Instead of opening windows facing main streets, a plenum system of ventilation should be adopted.

Mr. JAMES S. GIBSON (Messrs. Gibson and Russell) said the first condition that struck him in entering on a competition in the Metropolis was the elaborate provision for separating the sexes, a thing unknown in the North and the Midlands. In London even the entrances were ordered to be kept distinct; but by-and-by he ventured to hope that common sense would dawn even on competition committees, and these useless and costly separate entrances would be abolished. He agreed with Messrs. Mountford and Beale in regarding external corridors as impracticable, as both wasteful of space and unsightly adjuncts. A better experiment was to pave the surrounding thoroughfare with one of the numerous noiseless materials. The value of the information given as to relative grouping and size of departments and classes could not be over-estimated, and its effect should be very apparent on future designs submitted in competition. Too often lecture halls were demanded at least twice as large as would ever be needed. The dimensions should never exceed from 30ft. to 35ft. across and from 45ft. to 48ft. in depth.

The CHAIRMAN, in closing the discussion, remarked that there seemed to be a consensus of opinion in favour of the common entrance and recreation room, as accepted items towards solving the problem of keeping down the cost of maintenance of these establishments, and in the discussion the external corridor had been effectually abolished. He would advocate the division of classrooms by movable partitions, if any could be found that would not get out of order in school use. Surely in the next institute competition some enterprising architect would take the hint, and promise in the report accompanying his design to provide perfectly sound-proof partitions between classrooms by the use of some advertised material. He emphasised the importance of keeping down the height of a lecture room to the lowest point, and asked Mr. Wells how the plan of giving technical instruction to architectural students was progressing.

Mr. WELLS, in reply, said that unfortunately at Battersea no architects' pupils had presented themselves as students; if they did, he did not think they would be received, as they had been elsewhere, where the plumbers in a body threw down their tools and refused to continue work if men not actually engaged in the trade were allowed to learn. As to the area to be covered by a school, he was in favour where the site allowed of planning all on one floor. The fewer the stories occupied by a school, the easier was the task of supervision. He was not surprised to hear architects concur in objecting to external





corridors, but those who had to work in such institutions knew the disadvantages of street noises; moreover, Mr. Alfred Waterhouse, at the Leeds and Yorkshire Technical College, planned a corridor next the street with manifest advantage to the students. He had never seen an institute better arranged or more highly spoken of than that at Battersea; the lighting and ventilation were admirable. At the same time it had its faults, chiefly due to the fact that the size of the classes was not determined or even foreseen until after it was opened. He would emphasise the point that every endeavour should be made in planning and grouping to economise working expenses. The music-room should be placed over the great hall or over workshops. As to the advanced laboratory, they would be very glad of one at Battersea, and he regarded it as the next thing to be provided in such an institution after the absolutely essential. Mr. Beale had misunderstood him; he did not suggest that drawing classes should be carried on at the same time as workshop practice, but to utilise the workshops for drawing classes on the nights when not occupied by the trades. In the bricklaying and masonry shops this was impracticable, owing to the bulk and weight of the materials, and therefore much space had to lie idle for four or five nights a week.

#### GRAPHICAL DETERMINATION OF THE STRESSES IN THE MEMBERS OF A COLLAR-BEAM ROOF-TRUSS.—IV.

WE must now, by the application of principles *a* and *b*, as in our first example, Chap. I., separate those forces which produce cross-stresses in the members from those which produce direct stresses. The explanation of the working for the case shown in Fig. 6 will suffice for any other, it being borne in mind that, by altering the given forces, the nature of some of the resulting stresses may be changed from compression to tension, or from tension to compression.

In Fig. 6, *LA*, the resultant of *R<sub>A</sub>* and *F*, is resolved along and at right angles to the rafter *ABC*, thus giving the compression *MA* along the rafter, and the force *NA* at right angles to the rafter, producing a bending moment equal to *NA* × length *AB*. In Fig. 6A the forces *P<sub>1</sub>* (= *C<sub>1</sub>P<sub>1</sub>*), *Q<sub>1</sub>* (= *P<sub>1</sub>N<sub>1</sub>*), are found, which, acting at *BC* respectively, will, with the force *NA*, keep the rafter in equilibrium, and subject it to bending stress only.

Let the equal and opposite forces *PP<sub>1</sub>* be applied at *B*, and others, *QQ<sub>1</sub>*, at *C*. The force *NA*, *P<sub>1</sub>*, *Q<sub>1</sub>*, acting alone on the rafter *ABC* will keep it in equilibrium, and subject it to bending stress only. These three, and the resistance of the rafter to their bending action, may, by principle (*b*), be omitted without affecting either the equilibrium of the whole system, or the direct stresses in any member of the truss. The rafter *CDE* being similarly treated, we get the external forces *MA*, *F<sub>1</sub>*, *Q<sub>1</sub>*, *F<sub>2</sub>*, *ME*, *T*, *P* as those under whose action we have to consider the truss in order to find the direct stresses in the several members.

Fig. 10 shows the truss under the action of these forces, and *mabedefghm*, Fig. 10A, is the polygon of the forces. It remains, now, only to complete the polygon of the forces for each joint of the truss, and we shall have the direct stresses in the members fully determined. The polygon of forces for *A* is *nam*, giving compressive stress *ma* in *AB*. The polygon for *B* is *hmabkh*, and is found by drawing *Bk* parallel to *CB*, and *kh* parallel to *BD*, thus giving compressive stress *bk* in *BC*, and tensile stress *kh* in *BD*. The

polygon for *C* is *kbedek*, and is found by drawing *ek*, which must close the polygon and be parallel to *DC*, thus giving compressive stress *ek* in *DC*. The polygon for *D* is *ghkefg*, giving compressive stress *fg* in *ED*. The polygon for *E* is *fgf*, giving compressive stress *gf* in *DE*. The stresses are thus fully found, since the bending moment for each rafter has been already determined.

It taking leave of this subject, the writer may be allowed to urge those who have any occasion to deal with the problem of determining the stresses to which the parts of structures may be subjected, to carefully study the principles involved in each case. No attempt has here been made to explain fully the methods employed, except in the case of those which are peculiar to such a truss as the collar-beam truss. These were dealt with in Chap. I., and a careful study of that chapter should alone be sufficient to enable anyone fairly conversant with the principles of graphic statics to deal with the cases discussed in the present chapter.

J. C. PALMER.

#### THE BRITISH ART GALLERY, MILLBANK.

THE first visit of the Architectural Association for the present session took place on Saturday afternoon last, when a large party of members inspected the British Gallery of Art, now in course of erection on the site of Millbank Penitentiary, under the guidance of the architect, Mr. Sidney R. J. Smith, F.R.I.B.A., of York-buildings, Adelphi. It will be remembered that a few years ago Mr. Henry Tate offered to present a collection of pictures by modern British artists to the National Gallery. Owing to the lack of space at that institution, the trustees declined the proffered gift in bulk, but proposed to select a few of the choicest, and this suggestion being declined by the donor, an offer was made to accommodate the collection at South Kensington. Eventually, after much correspondence, the Government were induced to give a site of about an acre and a half of land, an eighth of the riverside area occupied from 1812 until within the past ten years by Millbank Prison, between Vauxhall and Lambeth Bridges, and Mr. Tate decided, in addition to presenting the pictures, to bear the entire cost of housing the collection. Mr. Sidney R. J. Smith, F.R.I.B.A., was appointed architect. The work has been carried out under two contracts, for the foundations and superstructure respectively, both taken by Messrs. Higgs and Hill, of Crown Works, South Lambeth. Building operations were commenced about three years since.

The gallery occupies the front portion of the site, the façade being set back some 60ft. from the Grosvenor-road, by which thoroughfare it is separated from the Thames bank. On either side and at the rear a broad, unoccupied space is left, while the site is bounded at the sides and back by a road 40ft. in width, so that an ample provision of light is secured for the pictures.

The plan now in course of execution is the fifth which has been made by the architect, each successive design revealing a shearing off of projecting members and of purely ornamental features, owing to the paramount necessity felt by many for an even distribution of the masses of building so as to insure a maximum of light. The greatest sacrifice to the exigencies of equable internal illumination has been the lopping off of the central dome, although the foundation walls have been built sufficiently deep and broad to carry an addition so desirable, so far as perspective effect is con-

cerned, and so little calculated to cast objectionable shadows, should wiser counsels prevail at some future time; in the mean time, it must be admitted that the sky-line of the finally adopted design is necessarily tame; but it is hoped that the addition of some figures on the acroterium (and other blocks) will alter this.

The style adopted may be characterised as a free treatment of Italian Renaissance, inspired by Greek motives. The main front and return sides will be entirely faced with Portland stone from the Fortunesswell quarries; but the rear elevation, which, when the entire scheme of extension is realised, will be partly demolished and partly inclosed as open wells, is a panelled treatment carried out in yellow Aylesford bricks of a tint which does not harmonise so well with the grey masonry as could be wished. Owing to the wretched character of the subsoil, river silt and peat, it was necessary to excavate over the entire area built upon to a depth of from 20ft. to 35ft., and the foundations are massively laid in stock-bricks on a bed of solid concrete varying from 3ft. at the wings to 5ft. in the centre in depth, the walling being in places 10ft. in thickness.

The present building scheme provides for a suite of galleries on one floor, raised on a lofty basement some 14ft. above the level of the surrounding roads, the total frontage occupied being 280ft. by about 160ft. in depth. The basement frontage and returns are heavily rusticated, giving an effect of great massiveness to the composition. In the centre of the Grosvenor-road façade, approached by a broad flight of steps, is a projecting vestibule, 56ft. wide by 26ft. in depth, with entablature and pediment carried by six columns, 3ft. in diameter and 30ft. in height, having enriched Corinthian capitals and bases. The pediment rises to one-sixth its breadth. Over this vestibule, which is vaulted in brickwork and has a range of Ionic caps and pilasters, is the only apartment on the first-floor level—a council chamber and miniature-room, 73ft. by 28ft. Behind the vestibule and entrance hall, in the central axis of the building, is an octagonal hall for sculpture, 38ft. across. This hall is lighted by an eight-sided glazed cupola, rising to a height of 76ft. 6in., and carried on eight Doric columns, each 2ft. in diameter, the height from pavement level to top of entablature being 25ft. 6in. There will be a fountain in centre of this hall. This central hall is surrounded by a corridor 12ft. in width, which also is carried above on the first floor, the same width, and with a balustrade round; the upper corridor is approached by two circular marble staircases, and is all top-lighted, the lower one being vaulted and groined in circular and elliptical work. Right and left of this hall, and recessed behind the vestibule, is, on either side, a picture gallery, having a frontage of 60ft. to Grosvenor-road and a depth of 32ft.; each of these galleries leads at the extreme end or return angle of frontage into a smaller octagonal gallery, 31ft. 6in. in internal diameter. Behind the galleries in the south-western or left-hand side, as viewed from vestibule, is the largest room in the building, measuring 93ft. by 32ft.; and on the right and north-eastern side is a shorter gallery, also 32ft. wide by 60ft. in length. A clear vista is afforded to this point through the vestibule and sculpture hall, and also from end to end of the small octagon rooms and intervening picture galleries across the hall, and it will be apparent that a visitor can pass in turn through all the galleries without having to retrace his steps. The basement is to be utilised as a picture-cleaning and framing room, dining-hall for the staff, offices, attendants' apartments, boiler-house, and rooms for heating apparatus and dynamo.

The architect appears to have borne in mind at every turn the primary object of the galleries as a receptacle for the protection and display of works of art. The rooms are, it will be noted, of a uniform width of 32ft., and 18ft. in height to plate level, affording sufficient area for hanging all the pictures within easy range of vision. The width will not be so great as to render the cross-lights embarrassing, or to tempt the authorities to cumber the floors with screens—the bane of the National Gallery, where these form an ever-increasing incumbrance, and obstacle to vision and locomotion. The galleries will be entirely top-lighted, with a single elliptical roof without an inner skylight; this roof will be supported by light steelwork, and will have at the ridge a central boarded area, about 6ft. in width, for carrying the electric wire cases for lighting, the ventilating shafts, and velaria. Below this,



to the coving, will be on either side a continuous glazing; this portion of the work is now being carried out by Messrs. W. Edgcombe Rendle and Co., of Westminster Chambers, S.W., in their patent Invincible glazing, with copper bars, the same as used at the National Portrait Gallery and Liverpool-street and Moor-gate-street Stations. The floors will be of oak, affording a firm and pleasant foothold, and the wall surfaces will be panelled in wood, and probably faced with crimson silk tapestry. The total hanging surface will be nearly the same as that provided in the Royal Academy; and when the entire extension is carried out at the rear, for which provision is made on the plans, the area will be just double in capacity. Every precaution is being taken to guard against the calamity of an outbreak of fire; the floors are fire-resisting (Dennett and Ingle's patent) and hydrants are provided throughout the building. All the structural steelwork in girders, and for the support of skylights, is being supplied by Messrs. Handyside and Co., of Derby; the warming apparatus is being fixed by Messrs. Z. D. Berry and Co., of Westminster, and the carving is being done by Mr. C. Smith, drawings of every part (full-size) being made by the architect, and Jennings and Co. will carry out the sanitary works.

The gallery, which is now being roofed-in, is expected to be opened in the spring of 1897, and, owing to the favourable weather, there is every probability that this promise will be fulfilled.

The collection to be presented to the nation by Mr. Henry Tate consists of pictures of the estimated value of £75,000 (and the building will cost over £100,000). They include Leighton's great circular composition, "And the Sea Gave Up the Dead," not, by the way, one of his best or most characteristic works; seven well-known and popular works by Millais, Alma Tadema's "Silent Greeting"; "The First Cloud" and "Her Mother's Voice," and one other, by Orchardson; four by Briton Riviere, three each by Hook, Thomas Faed, and J. W. Waterhouse, two each by Landseer, Dendy Sadler, Erskine Nichol, Frank Holl, R. Linnell, and S. E. Waller, Luke Fildes' "Doctor," and figure subjects by Hopper and Albert Moore, seascapes by Peter Graham, a battle piece by Lady Butler, *genre* works by Haynes Williams, and landscapes by Leader, H. B. W. Davis, Keeley Halswelle, and others. Stored in the basement are a series of life-size female figures, modelled by Flaxman, from the façade of the old Haymarket Theatre. The institution will be under the control and management of the National Gallery trustees. The architect has been most careful that only English firms are employed, and only English materials used on the building.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XVI.

By JOSEPH HORNER.

VITRUVIUS lays down the canon that the three qualities essential in a fine building are stability, utility, and beauty. Cast iron is a material capable of fulfilling the first two conditions to a large extent; but it is not usually deemed suitably adapted for the third. I am neither an architect nor an artist; but I understand the fundamental ideas of the architect and artist in reference to the employment of any material to be these:—That designs executed in it should be in harmony with the physical characteristics of that material, and should not be imitations of designs which are suitable to, and embodied in, materials having other physical characteristics. Also, further, that the essential proportions and harmonies of the Classic orders should not be departed from or violated. It follows that since the physical characteristics of cast iron are totally different from those of stone, or timber, the architectural forms which have been embodied in these should not be imitated in cast iron. Hence a new order or type of architecture, new forms of ornament, ought to be initiated for the use of the iron-founder. The only suggestion which I have seen that would harmonise entirely with this canon is that the lines of force and stress should be mainly embodied and emphasised in designs in cast iron. As a matter of fact, this is what is done in wrought-iron bridges of lattice work, composed wholly of straight bars proportioned to the various stresses of tension and compression. These, however, are the embodiment of purely utilitarian ugliness, and ornament here would not

disguise their ugliness. The light and airy suspension-bridge is also designed in relation to the lines of force. So is the cantilever bridge, and both are elegant; but they are not ornamental. The engineer designs all his motors and mechanisms solely in congruity with the forces to which they are subjected; but they are not ornamental. Ornament must be something extraneous when applied to cast iron, and ornament must be copied either from Nature or from Art, leaves, stems, and floral forms, in their myriad arrangements, from Nature; and bases, shafts and capitals, entablatures, and mouldings, in all their wealth and variety of detail, from Art. If the iron-founder is prohibited from utilising this wealth of ornament which has been appropriated by his predecessors, all sources of beauty are closed against him. He cannot evolve ornament from the inner consciousness; no individual or nation has ever done that. All architectural beauty has been imitated, developed, and modified slowly through the ages, and its rude beginnings can only be guessed at. The modern iron-founder is therefore in a predicament, because his choice is narrowed down so tremendously. He has only one course before him, and that is, to work on those lines which are really practicable, and this is what he does. An iron-founder does not often cast columns of pure Doric, or Ionic, or Corinthian types, for the simple reason that there is not sufficient demand for them to make the venture pay. Architects would not approve of them, and the general public do not appreciate them. This is the real reason why so many bastard columns offend the cultured eye in many localities. The same remark applies to much ornamentation of a minor character, and to the incongruous association of plinths, capitals, architraves, friezes, and cornices belonging to different orders, or to their omission or disproportioning. All this is very heterodox, and offensive to minds nursed in chaste Classic forms; but the time is not favourable to the development of a more perfect system of ornament.

It must be borne in mind that utilitarianism rules to-day. There is little culture of art for its own sake; people buy cast iron because it is cheaper than mason's work. If builders, working entirely under competitive conditions, are offered a column which pleases the eye at a reasonable cost, that is all which they or their customers require. If it is for a shop-front, it is a matter of little moment whether it is half as long again as it ought to be consistently with Classic proportions. A column of a certain length is required, and no larger in diameter than is requisite to sustain the weight upon it. Perhaps the entablature will go no higher than the architrave; probably a cornice only will be perched directly on the column. Take lamp columns, again. There is no order of architecture which, if adopted in its purely classical simplicity, would be considered suitable for public lamps. Columns of entirely original or bastard type have, therefore, been produced, in which the lower portion of the shaft is enlarged abruptly, the enlargement being rendered slightly less displeasing by the presence of a moulding.

All the noblest architectural works of the world have been executed by kings and rulers, with national resources at their command, and not by private individuals. Cost has, therefore, rarely been considered. The case is different with cast iron. It is used mainly by private individuals, or by public companies, to whom cost is the principal consideration. The iron-founder, therefore, has to produce castings which will not be too costly, and which shall have a pleasing effect. If he fulfils these conditions he suits his customers. It is impracticable in many cases to reproduce purely Classic design in English buildings and structures. If the iron-founder often violates the canons of pure taste, that is either the fault of his customers or of the leaders of art.

Few probably would be bold enough to advocate the use of cast iron in national works of a highly architectural character. There is a something that strikes one as being quite incongruous in the association of cast iron with Classic design. This feeling may be largely referable to conservatism of ideas. Some of the early stone architectural designs were based upon those of an earlier architecture of timber. Doubtless that appeared to many very incongruous at the time. If so, the sentiment has been long outgrown. Might it not also have happened that the decoration of stone with carvings of stems, leaves, and flowers should have once seemed not in accord with Nature, and that a Corinthian capital, may be, was voted not

in harmony with the canons of taste, and that a Doric or Ionic capital might have been deemed better in harmony with the material in which it was carved? If so, the case with cast iron is somewhat similar to-day. Engineers design their castings on the lines of utility alone. Strength and proportion are imperative. The architect can but decorate these utilitarian castings on the lines whereon he has been accustomed to work. He cannot design a new style *ab initio*. Hence he culls ornament from Greek and Roman columns, bases, shafts, and capitals, from architrave, moulding, frieze, and the rest. The nearer he copies Classic models, the more beautiful will his work be deemed. And if craft is wedded to art, if the founder endeavours to grasp the idea of the architect, if the best technical skill is brought to work out that idea, the result will be truly architectural. To a large extent this is done to-day. If there are ugly designs, there are also designs cast which rival in delicacy and finish, in sharpness of detail and pleasing effect, those carved in stone. The founder can do nearly everything which the architect may require of him. And I think that it may be safely asserted that in the more delicate tracery the casting is likely to outlast when exposed to the weather of our climate any similar work done in stone, unless we except one or two of the kinds which are costly to purchase and costly to carve. Still, when the best is accomplished, and the iron painted or gilded, there is the sense of incongruity ever present—the consciousness that it is not stone, but only common iron; not the ancient material of the Classic architects, but the parvenu of yesterday. The force of association is strong in men's minds, as we may see if we take another way of looking at this matter. Bronze has been used for ornamental castings for many hundreds of years. Many specimens of tomb and altar rails and grilles still exist in bronze. If these were cast in iron now, they would be severely criticised, just as iron railings are to-day. Yet there are many specimens of iron railings now cast which are every whit as beautiful—often, too, more elaborate than those older ones in bronze which elicit the unqualified admiration of the antiquary. I fancy that in some instances at least, disparaging comparisons have their origin in the love for the old and the dislike of the new, which is a natural sentiment in the cultured mind. Again, if foliage is deemed suitable for ornament in wood and in stone, why not in iron? The wood-carver and the mason simply imitate living Nature, and embody Nature's forms in inanimate materials. Why should not the founder be permitted to do the same? Iron, moreover, lends itself more readily to the realisation of plant forms than either wood or stone. It would need a skilful carver to imitate in wood or stone many of the designs which the founder casts readily. Further, it is as easy to proportion parts correctly in iron as in stone. Symmetry and harmony of parts are readily embodied in a material which can be cast into almost all conceivable forms. And it is only in the case of a few details of the more lavish architectural styles that difficulty occurs. These are chiefly the Corinthian capitals. Nearly all mouldings can be readily cast. So can bases, shafts, entablatures, architraves, &c.

It seems to me that if one were asked what kind of ornament would be most clearly in harmony with the physical character of cast iron, a reply must be of a two-fold nature. As a material ready for use it is very rigid, and therefore rigid lines, as in fluted columns, should be embodied in its castings. But it is fluid in the hands of the founder, and is therefore suited for flowing curves. From this point of view it would seem more fitting that floral emblems, stems, and leaves should be embodied in cast-iron ornament than in that of wood or of stone. Such ornament has always been deemed fitting in wrought iron, and in thin sheet metals, for which their tenuity and ductility render them suitable.

So long, then, as engineers and architects use cast iron in those applications in which its capabilities are utilised to the best advantage will the conditions of true utility and of beauty be observed. This is the canon which has been observed by the builders in timber and stone, and there is not the least difficulty in its application to cast iron. Quite apart from the question of relative strengths in tension and compression and cross-breaking, there is the equally valuable property which cast iron possesses of taking any form which the founder desires to impart to it, regulated only by the limitations due to its property of shrinkage during cooling. There is



no short grain or stratification in iron as there is in timber and in stone. It is purely crystalline, the crystals arranging themselves at right angles to the outer surfaces. A material which possesses these properties should be highly valuable, not only for constructional elements, but for details of an ornamental character; and whatever critics may say in disparagement of the present state of ornamental ironfounding, it seems to me beyond question that the craft has already attained a high stage of perfection in Scotland and in England. The productions of Walter Macfarlane and Co. and of the Coalbrookdale Company are marvellous specimens of the founder's craft, and even though the purely Classical orders are scarcely represented, an immense selection of really beautiful designs to suit all classes of ironwork are obtainable cheaply. I do not wish to lay myself open to the charge of speaking disrespectfully of the old Greek and Roman architecture; but I do say that only those whose training has been such that they can see no beauty outside the Classic forms and proportions would withhold a meed of admiration for the productions of the modern foundries, some of the principal of which I will now pass in review.

### THE TIMBERS OF AUSTRALASIA.—III.

HARDWOODS.—I. NEW SOUTH WALES.—(continued).

**R**ESUMING my observations on the important family of the ironbarks, two remarkable facts remain to be noted. One of these is, that notwithstanding their density and hardness, they can be bent into any reasonable shape when properly steamed, yet quickly dry in their bent position, and at the same time retain their valuable properties unimpaired. The significance of such a quality in connection with many kinds of work, but particularly in shipbuilding, can need no emphasis. The second fact has reference to railway sleepers, and consists in the presence of a certain acid in the ironbarks (and some other hardwoods) which corrodes the surface of the iron bolts driven into them. While the bolts in the soft Baltic timbers gradually loosen through the vibration caused by passing trains, and the permanent way becomes consequently less secure, the bolts in ironbark get fixed almost irremovably by the corrosion, becoming actually part and parcel of the sleepers.

But there are some defects common, more or less, to all ironbarks. Firstly, there are the large round holes (about lin. in diameter) made by the larva of the wood-moth, called *Eudoxyla*, in its erratic boring movements in the log. It is not the hole itself which injures the girder; the real danger lies in the grub touching the heart of the wood, and, by exposing it to moisture, causing decay and rot, which rapidly increase. "An experienced hand"—says one of the most trustworthy timber experts in Australia—"can detect the rot inside a girder by the sound made with the blow of a hammer; but in ordinary cases, when grub-holes are to be seen, it is well to bore an auger-hole through the heart, close to the entrance and along the line. If no rot appears, you can rely on the soundness of the piece." Secondly, there is the danger of plugging. Some unprincipled timber getters are most accomplished experts at plugging what may be a very faulty stick, this being done at the dry limb knobs, which should always be carefully examined in girders containing heart. A sharp hammer-blow on the knob will quickly expose the plugging, as it will move under the concussion. Still, it should constantly be borne in mind, with reference to ironbarks, that the heart of the tree is always the first to decay. Consequently, it is well to avoid using heart-pieces whenever possible, or, when it is not so, to place the heart side of the piece downwards or inside, as the case may be—an observation that may be considered as applying to the use of hardwoods generally.

Dismissing this modicum of danger, so great are the weight and density of the ironbarks, that the best of this timber bears a tensile strain nearly twice that of the best oak and nearly half as great as wrought iron; while time, fire, water, and the destructive marine insects seem equally unable to make the least impression on it. The ironbark principals of the old George-street markets in Sydney, which were put up early in the century, and were lately pulled down, were found to be as sound as the day they left the axe; and I myself have been an eye-witness during the last few months of the perfect condition of the ironbark piles of the old wharves on the

western side of Circular Quay, which I saw removed to allow of extension and improvements. These piles had been in the salt water, unsheathed with metal, about 40 years, and will be used again after being cleaned and trimmed. The Pyrmont Bridge across Darling Harbour, Sydney, was built of ironbark 38 years ago, and it has lately been decided, after a variety of expert investigations, that the structure, notwithstanding the large amount of the very heaviest traffic that it carries, is still sound and strong enough to last, with a few necessary repairs, for at least another generation. Then, a huge piece of grey ironbark, now in the possession of Mr. Gavin Scott, and which I lately saw, bears the following label, signed by Mr. R. R. Hickson, M.I.C.E., Engineer-in-Chief to the Public Works Department of New South Wales:—"Portion of one of a number of sills forming the foundation for piers of a masonry culvert at Long Bridge, West Maitland, erected by convict labour in 1832. The sill from which this piece of timber was cut was about 8ft. below the surface, and about 14ft. long. Removed during the reconstruction of Long Bridge in 1894." The timber is in perfect preservation.

Ironbark is employed for the girders and stanchions of wool and heavy goods stores, piles for wharves and bridges, railway sleepers and wood-paving blocks, for ship-building, and wherever density, weight, strength, and durability are needed. As long ago as 1834, if not (as is probable) even earlier, it stood in the first class on Lloyd's list of ship-building timbers, and was already extensively used by European ship-builders, though there is reason to believe at the present time that the specimens then sent home, and tested, whether by Lloyd's Committee or at Her Majesty's Dockyards, had mostly been felled at improper seasons of the year, and were very imperfectly seasoned. As a practically fireproof support the value of ironbark has been widely recognised, and was particularly emphasised by Mr. J. Horbury Hunt, F.R.I.B.A., when President of the Institute of Architects of New South Wales, after several large fires which took place in Sydney a few years since. At the present time the story-posts and many of the girders of some new and extensive business premises now being erected by the Equitable Life Assurance Society of the United States in George-street, Sydney, next to their own palatial offices, are of grey ironbark, the posts being finished (for exposure) with slight ornamentation in the way of chamfers and banding of sunk beads, the Society's chief architect being of opinion that there exists no safer and better material for the purpose than this remarkable timber.

Stringybark (*E. capitellata*, *E. Eugenioides*, and *E. macrorrhyncha*), so-called from its peculiar fibrous bark, grows chiefly on the northern table lands of the colony. The tree is a large one, and the wood is remarkable for its extreme fissile strength, its toughness, lightness, durability, and non-inflammable character. With reference to some of these characteristics, there are still in the houses in Parramatta, near Sydney, and almost the oldest town in Australia, rafters made from stringybark saplings grown in the neighbourhood, which now, after a lapse of 72 years, are as sound as the day they were put in; while a burning log has been known to fall on a stringybark floor and remain there for hours with no further effect than to char the wood of the floor. The tree known as *E. capitellata* sometimes attains a height of 400ft., and the *E. Eugenioides* 200ft.; the timber furnished by the latter, however, the bark of which is smooth, though fibrous, is not considered equal to that of the other species, whose bark is strongly furrowed and of a dark grey colour. Though admirably suited for girders, stringybark is of little use for piles. The straight grain of this tough, strong wood somewhat resembles that of the American ash, but its peculiar strength of fibre prevents the maintenance of a good surface, and even when kept moderately dry—a matter of importance with this timber—the grain rises, so that it is impossible to polish it successfully. But for railway sleepers on a fairly dry soil, the framing of railway carriages and trucks, carriage, cart, and waggon building generally, as well as for agricultural machinery, stringybark has, I believe, no superior; while it is likewise employed with every success in house carpentry, including floor boards, battens, joists, and rafters. Messmate (*E. obliqua*), though indigenous to the southern part of New South Wales, is rather a Tasmanian timber. It takes its appellation from being the close companion of stringybark, by

which name it is often called. It is an immense tree, frequently 250ft. high, with a very tenacious, rugged, and fibrous bark, and its general characteristics are much the same as those of the stringybark.

Blackbutt (*E. pilularis*) is a most valuable timber, pale coloured, more or less fissile, though sometimes quite interlocked in the grain, and almost as strong as ironbark. It is widely distributed along the coast districts, and often attains a very great size. At Bulli there is a tree 57ft. 6in. in circumference, while a height of 200ft., with a diameter of 15ft., is no uncommon thing. The more frequent height, however, is about 100ft. The timber derives its name from the fibrous bark on the butt of the tree, which is of a dark grey colour, sometimes almost black, though its extreme depth of hue has sometimes been ascribed to bush-fires. Although the wood is particularly compact, with a light colour, a very close grain, and a nice smooth surface, blackbutt is a comparatively rapid grower. It is extensively used for many purposes, requiring strength, particularly for house-building and ship-building (for the former of which it is one of the very best timbers), for bridge-planking, and ship's-decking; but it is not adapted for employment for square girders and other of the heavier forms of bridge-work, owing to the disposition which it sometimes shows to crack and open. Perhaps the most important of all its uses is for wood-paving blocks. In the city of Sydney over 14 miles of the street roadways are now paved with wood, and the timber chiefly employed for the purpose is blackbutt. For this description of work it takes an equal position with tallow-wood, and for general purposes these two most valuable timbers rank next to ironbark among the hardwoods of the colony.

Spotted gum\* (*E. maculata*) is one of the handsomest of the open forest-trees of the mother colony, growing in all the coastal districts, and in some parts of the interior, with an average height of 100ft., and a diameter of 28in. It is an extremely coarse-grained timber, and takes its name from the blotched appearance of its bark, which is smooth, with white patches where the outer layer peels off. The quality of the wood, which is a pale yellowish brown, varies greatly, according to the habitat and the nature of the soil, the poorest soil giving the finest product. Spotted gum is well adapted for both ship and house-building, as it is very durable if not exposed to the weather (as it would scarcely be, for instance, in joists, studs, &c.), while the heavy appearance of the grain produces an excellent effect when polished. Owing to its great tenacity and strength of fibre, its extreme elasticity (which is greater even than that of hickory), and the ease with which it both splits and bends over when cold, the wood is unequalled for the use of wheelwrights and coachbuilders for the naves and spokes of wheels, the shafts of vehicles, and for similar purposes. To the Northern Briton it should commend itself as being excellently adapted for the handles of his favourite golf-club. This timber will not, however, stand in the ground, and the sapwood is peculiarly liable to decay, for which reasons the Government of Queensland prohibited its employment for telegraph poles some years ago, while municipal experience in Sydney has hitherto shown it to be unsuitable for wood-paving. Upon this point, however, such conflicting testimony exists, that the Minister of Mines and Agriculture of New South Wales has lately appointed a committee of experts to inquire into the matter, whose report is expected to be published shortly. Pending its appearance, and any contradiction it may contain of the city surveyor of Sydney's special experience on the subject, English surveyors will do well, I think, to avoid the use of spotted gum for wood-paving.

The blue gums afford a specially noteworthy instance of the confusion still attendant on the nomenclature, scientific as well as vernacular, of the Australasian timbers. Up till about the year 1890 blue gum was universally diagnosed as *Eucalyptus globulus* (which is chiefly a native of Victoria and Tasmania, but was discovered by the Rev. Robt. Collie, F.L.S., in 1880, growing in the southern districts of New South Wales). But three or four years ago, the blue gum belonging properly to this colony was determined by Mr. Maiden to be a distinct species, which he christened *E. Maidenii*; though Mr. T. A. Coghlan, the Government Statistician, sticks to the old

\* In Australia, the term "gum" is applied to those species of *Eucalyptus* which have smooth barks.—D. L.



name, and, in his "Wealth and Progress of New South Wales," still calls it *E. globulus*. In South Australia, however, what is known as "blue gum" is really a local ironbark (*E. leucosylon*); while in Victoria, Tasmania, and South Australia (and, according to Mr. Perrin, Conservator of State Forests in Victoria, in New South Wales as well) there is a "bastard" or "pseudo" blue gum (*E. goniocephala*), which is now beginning to be called "grey gum." Mr. Perrin states that "the *E. goniocephala* is so like the *E. globulus*, both in the wood and in the young state of its foliage, that it has time after time passed the Victorian Railway experts for blue gum, and has consequently, perhaps, given blue gum a bad name, as it is decidedly inferior to it." On the other hand, Mr. J. V. De Coque, Inspector of Timbers to the Public Works Department of New South Wales, calls *E. goniocephala* "mountain gum," and speaks of it as "a remarkably durable, clean-grained, useful timber, and very highly esteemed." He adds:—"I find it, with a record of nineteen years in bridges, perfectly sound. It also stands well in water and damp places. For general building purposes I would recommend it highly. It is, for a hardwood, easily worked, and gives a clear face to the plane. It shrinks evenly, and does not split to any great extent during seasoning." Mr. De Coque's opinion must always carry very great weight; still, in a conflict of testimony between two such experts as he and Mr. Perrin, a layman like myself is forced to fall back upon the well-known line of Pope—

"Who shall decide, when doctors disagree?"

But returning to our flock of blue gums, this is not all. There is still in New South Wales the *E. saligna*, to which Mr. De Coque gives, in a paper which he read on August 1, 1894, on "The Timbers of New South Wales," before the Royal Society of that colony, the two vernacular names of "blue gum" and "flooded gum"; the former being, he says, a superior timber to the latter, and the two being known as distinct woods in the local timber trade, the "blue gum" being accepted where the "flooded gum" is rejected. "The name 'blue gum,'" adds Mr. De Coque, "is most unsuitable; we have two other 'blue gums' in the colony, *E. globulus* and *E. Maidenii*, to neither of which it presents the slightest resemblance." Leaving, however, the splendid *E. globulus* till I come to the sister colonies, the *E. saligna* (which, by the way, Mr. H. Deane, Engineer-in-Chief for the Construction of Railways, N.S.W., still further designates "white," "grey," and "silky" gum, and which Mr. Maiden now calls "Sydney blue gum") is, when good and obtained from the neighbourhood of Sydney, and not from the northern parts of the colony, a pale red, straight, and close-grained timber, valuable for general building purposes, taking the plane readily, and presenting a beautiful face when worked (which it does superbly), and consequently in much favour among architects. When finished, it somewhat resembles forest mahogany in appearance; it does not easily catch fire, and it rarely shows a disposition to warp or split after drying. So slowly, indeed, does the wood ignite, that it may be described as almost fireproof. It is useful for railway sleepers, ships' planks, wood-paving, and particularly for the felloes of wheels; and the tree grows to the height of about 140ft., with a smooth, silver-grey shining bark, which sheds in thin longitudinal strips. The *E. Maidenii*, of the southern ranges, is a still larger tree, often attaining a height of 200ft., with an average diameter of 48in. It is principally used in the colony for fencing, rails, posts, and wheelwright's work, and for the rougher purposes of building, for the latter of which it answers well when employed in large sizes only, such as square piles and girders. The timber is interlocked in grain and remarkably tough, and for round piles there are few that equal it in durability.

DE LIBRA.

(To be continued.)

## NOTES ON DOMESTIC DRAINAGE.—II.

### THE STORM-WATER SECTION.

NOTHING should be allowed to enter these drains except uncontaminated storm or rain water. Any gullies or areas receiving rain-water which is liable to become fouled must be connected to the foul-drainage, and not to the storm-water section. All gullies on the storm-water section should be *trapless*, but may be provided

with a silt-pit, in which any sediment or heavy substances, such as sand, &c., may be retained for periodical removal. The intercepting chamber to the storm-water section at its junction with the foul drain must be provided with an open grating or ventilating chamber, so that a current of air may pass freely through all the drains comprised in this section.

### THE FOUL-DRAINAGE SECTION.

The whole of the gullies connected with the foul drains must be *trapped*. The branch drains should be as short as possible; but at the same time the collecting drain for the branches should be kept at least 8ft. away from the walls of a building, to avoid the risk of sewage soaking into the basement from a defective pipe or joint.

It is not often practicable, although theoretically desirable, to ventilate each small branch; but it is imperative that at least the head of each collecting-drain shall be open, to allow a current of air to circulate through them. Where branch drains are more than 20ft. long, they should be ventilated.

As far as possible, all sanitary fitments within the building should discharge in the open air over trapped gullies. Where this cannot be carried out, as in the case of w.c.'s, housemaids' sinks, &c., they should be connected with the *untrapped and ventilated* head of a drain or branch. The passage of any sewer-air into the building through the fitment must also be further safeguarded by the proper construction of the fitment itself.

The foul drainage must be distinctly disconnected from the public sewer by means of an intercepting chamber, and provision also made at this point for the admission of a continuous current of fresh air for circulation through the drains.

### GENERAL PLAN.

A general site plan of all the buildings for which drainage is required should be prepared, and the position of every soil-pipe, slop-sink, waste, rain-water pipe, surface-gully, &c., shown thereon.

The position of the junction with the public sewer having been fixed, a series of levels are required to ascertain the relative heights of the various gullies, &c., and the amount of fall available between them and the outfall.

Having decided which of the wastes, soil-pipes, and gullies shall be considered as discharging foul or storm-water respectively, they may be grouped together in the most convenient manner, so as to complete the foul and storm-water sections. When it is not intended to store the rain-water in an underground tank, the foul and storm-water sections are brought together at some convenient point, and carried direct to the proposed junction with the public sewer.

In determining the lines of drainage, due regard must be given to the natural contours of the ground, and the falls available for each of the branch drains. They should be laid in perfectly straight lines, with an even gradient from point to point. Wherever one drain joins another, or any change—either in direction or gradient—takes place, an inspection chamber should be provided, except, perhaps, in the case of an unimportant branch. This is required, so that all the drains may be accessible for examination and cleansing at any future time. Where long lines of drains occur, a series of inspection chambers must be arranged about 200ft. apart to allow of every portion of the drain being reached by drain-rods if necessary. The drains should be designed and constructed not only to allow a current of air to pass through them, but also to permit the escape of vitiated air at such points where its discharge will not in any way be offensive or injurious to health. With regard to stable drainage, it is better to keep it entirely separate from the house drains, and arrange for an independent outfall to the public sewer.

### VOLUME OF SEWAGE AND STORM-WATER.

To determine the proper sizes for the various drains, it is necessary to calculate the maximum amount of drainage to be removed by each drain. Dealing first with sewage proper, it has been found that the whole of the water supplied for domestic purposes will practically be removed in some form or other as "sewage." The average daily consumption of water for domestic purposes is about 30gal. per head. Provision must, therefore, be made for the removal of 30gal. (or about 5c.ft.) of sewage per head of occupation in every

24 hours. As the discharge of sewage is not regularly distributed over the 24 hours, but varies considerably at different periods of the day, it is usual to assume that half the total daily discharge will pass through the drains in six hours. This gives 2½gal. of sewage per hour for each occupant as the maximum hourly discharge that may require to be removed.

With regard to storm-water, for large areas of partially absorbent surfaces, such as gravelled yards, &c., it is sufficient to consider ½in. per hour as the maximum amount of storm-water to be carried from such areas. For roofs, stone or concrete surfaces of yards, and other similar impervious surfaces, it is advisable to provide for a maximum rainfall of 1in. per hour. In other words, provision must be made for removing half a gallon of storm-water per hour from each superficial foot in area of the roofs and yards served by the drain under consideration.

The maximum hourly volume of sewage and storm-water to be discharged at the outfall can thus be readily calculated, and also the maximum hourly volume to be carried by each branch drain comprised within the foul or storm-water sections.

### GRADIENTS OF DRAINS.

The gradients that may be given to the drains will depend on the natural contours of the ground and the fall available between the outfall and the various points of discharge to be connected thereto. As far as possible, all drains should be laid with *self-cleansing* gradients—i.e., laid to such falls that the velocity of the sewage or storm-water flowing through them under normal conditions is such as to keep the drains free from any deposit.

When calculating the gradients that may be given to each drain, it must be borne in mind that wherever there is a change of direction, additional fall must be given to compensate for the increased friction at such point, so that the velocity of the flowing sewage may not be reduced. For this purpose an additional fall of 1½in. at every junction or change of direction will generally be sufficient. Where the junction occurs within a manhole, an extra allowance equal to half the diameter of the main drain, must be provided, in order that the minor junction or branch may discharge *over* the main channel. At points where an intercepting trap is placed, an allowance of 3in. must be made for the difference of level between the inlet and outlet of the trap.

Should local circumstances not admit of the whole of the drains being laid to self-cleansing falls, it is preferable to lay the main drain at a flat gradient than to sacrifice the self-cleansing gradients of the branches to admit of a slight additional fall being given to the main drain. In cases where it is found necessary to lay the main drain at a flat gradient, a flushing-chamber should be provided at its head, so that it may be periodically flushed and cleansed.

When sufficient fall is otherwise obtainable, it is in every way a false economy to endeavour to save a few inches—or even feet—in the depth of excavations required for the drains, if it is effected at the expense of forming flat or insufficient gradients. Provided the drains are properly laid, with all necessary inspection chambers, &c., there should afterwards be no necessity to disturb any portion of them. But if the gradients are insufficient, or the system badly-designed and carried out, the drains will become a constant source of annoyance and expense. It is not advisable, however, to lay stoneware drains at a steeper gradient than 1 in 10, for if greater falls than that be adopted the glazed surface of the invert of the drain is liable to become worn off by the friction of passing substances, such as sand, &c. In places where such steep gradients are required, cast-iron pipes should be used.

### TECHNICAL INSTITUTES.\*

FOR obvious reasons, you will not expect me to speak of plans of technical institutes as influenced by the shape and size of the site. Nor shall I attempt anything so impossible as to describe a plan suitable for any institute, in whatever part of the country it may be built. On this question I can only urge the necessity for a close study of the needs of the locality before the building is commenced. The size and arrangement of rooms suitable for the metal-working industries of Birmingham would be ill-adapted

\* By SIDNEY H. WELLS, Principal of the Battersea Polytechnic. A paper read before the London Architectural Association on Friday, Feb. 7, 1896. (See p. 230.)



for the chemical workers of St. Helen's. Institutes for the tanners of Bermondsey, the furniture-makers of Shoreditch, the engineers of Woolwich, or the building artisans of Battersea require very different arrangements. It is not enough to provide a certain number of rooms and trust to chance that they will be found suitable, nor to too closely copy the plans of some other building. I only know of competitions being open by the number of architects who visit Battersea. There are, however, very many important matters which are common to all technical institutes. The ordinary subjects of pure and applied science find a place in all their curricula; workshops and domestic economy workrooms are seldom absent, art, music, and commercial subjects are commonly included, while they all require the same provision for administrative and general functions. Institutes of the class of polytechnics only differ from others in their inclusion of provisions for social and recreative work, and the greater number and variety of subjects which they teach. It will, however, be my aim to make my remarks as general as possible, and capable of application to any institute with which you as architects may be called upon to deal. For convenience in treatment I will divide the requirements which a technical institute may be called upon to fulfil into the following sections:—(a) *Educational*; (b) *Administrative*; (c) *Recreative and Social*; and (d) *General*. The appendix is a complete statement of the usual provisions for these sections, omitting ordinary classrooms, as found in an institute of the polytechnic class. It shows the number and character of the different rooms required for the several departments, their most suitable position in the building, and relatively to each other; the rooms which require special provision in the way of lighting or ventilation; those which require power for driving machinery or strong floors with freedom from vibration; those in which the work carried on is necessarily noisy and likely to disturb other classes, and those in which fireplaces should be fitted, in order that they may be used in cold weather when the heating apparatus is not in use, as during vacations. It also distinguishes those rooms which are essential from those which are conveniences, and may be dispensed with in case of need, the latter being printed in italics. It groups together those rooms which should be near to each other, while those rooms which it is essential to have next each other are shown by being bracketed together with square brackets. In all such cases the rooms marked *d* should have a door to allow of direct passage from one to the other, in addition to separate entrance-doors. It would appear, from the column in the appendix showing the position of the rooms in the building, as though the institute would be made up almost entirely of a ground-floor. To this criticism I can only say that my experience at Battersea, and my knowledge of other institutes, leads me to believe that the position shown is certainly the best if it can be secured. Of course, the appendix does not pretend to specify the exact number of rooms required in the several departments; this must obviously depend upon the number of students. The importance of a convenient grouping together of the different rooms which constitute one department cannot be over-estimated. Students are kept better under supervision with a fewer number of teachers; time is not lost in the transit of apparatus and materials, or in the passage of students from room to room, the contents of the room are better safeguarded, and the whole department is more economically and efficiently managed. Before dealing with the requirements of the different departments it will be convenient to speak generally of those rooms which are similar in character and common to several departments. In this consideration, as, indeed, in all, it is necessary to remember that, although technical institutes are chiefly used by adult students (sixteen years of age being the usual minimum), they are being increasingly used also for day-schools, where the students are from thirteen to seventeen years of age, or even in some cases younger. The special provisions necessary for such use will be pointed out. *Lecture-rooms*.—By lecture-rooms is meant rooms in which the lessons given are accompanied by experiments, or the display of apparatus, models, and diagrams, as in the case of nearly all science and technical subjects. In such rooms more space is required for the lecturer and the lecture-table than in ordinary classrooms, and the desks should be arranged in the form of a rising gallery, so that all students may command

an uninterrupted view of the lecture-table. The rise of the seats may be from 6in. to 12in., and should increase towards the back, so that the seat-tops form points in a rising curve, instead of in a straight line. As a general rule, the construction adopted does not allow the space under the gallery to be usefully utilised, although there is no reason why it should not be converted into store-rooms, if not, indeed, into something more valuable. In the Birmingham Technical School this space has been converted into very convenient rooms or galleries for optical work, for which purpose they are well suited, as no natural light is required. The galleries have a greater slope than at Battersea, having a rise of 8ft. from front to back, with seven or eight rows; but this is distinctly an advantage, and, of course, adds considerably to the space underneath. One of the most convenient gallery-seats I have seen is in the Science Block of the Leys School at Cambridge, where each seat is 14in. above the one below it; but even here the space underneath the gallery is not utilised, except to increase the ventilation of a lower room. The question of whether the seats should be arranged in long, straight lines parallel to the lecture-table, or grouped in three rows around it, depends chiefly upon the shape of the room. If the lecturer faces the long side of the oblong, the latter arrangement is preferable; but if the short side, then the former. At Battersea the chief lecture-rooms are 34ft. wide and 42ft. deep, and the lecturer faces the short side, so that long, straight seats give all that is desired; whereas at Birmingham the rooms are 46ft. wide and 34ft. deep, and the lecturer addresses the long side, so that the seats are arranged around the lecture-table. With regard to the important question of the size of lecture-rooms, my experience is that, as a rule, they are made too large. The ordinary evening classes in such subjects as chemistry, physics, mechanics, building construction, and practical geometry ought not to exceed from forty to fifty students. For casual popular lectures, or for literary and general subjects, it is, of course, as easy to efficiently lecture to hundreds as to twenties; but when it is necessary for each individual student to closely follow the lecturer in all he says and does, as with experiments and demonstrations, and when, moreover, the lecturer should maintain a good grip of his class, and should teach, not merely lecture, then such numbers as forty or fifty form a reasonable limit. Of course, this means a greater number of classes, but of its greater efficiency there is no doubt. It must also be remembered that if elementary classes are large, advanced classes are usually small, and it is anything but effective to lecture to a class of a dozen or score students, in a room with accommodation for ten times that number. As bearing on this point, I may say that the average number in eighteen evening classes at Battersea which are held in lecture-rooms is eighteen, the largest number being forty-six, and the smallest four. For day-classes the numbers average from thirty to fifty-five. From inquiries in other institutes, I find that evening lectures with an average attendance exceeding fifty or sixty are an exception. It is, however, advisable to have one lecture-room, with seats for a larger number than mentioned, especially if there is no great hall, and it is very useful for general meetings of students, popular lectures, &c. This room should be attached to the department which is likely to receive the greatest number of students. In all lecture-rooms for science and technical subjects, provision should be made behind the lecture-table for large blackboards, for the display of diagrams, and for a lantern-screen, the lantern being easily worked from the table if fitted with a short-focus lens. It is also necessary to provide for a supply to the lecture-table of gas, hot and cold water, and, if possible, also of steam, with necessary sinks and wastes. It is not necessary to provide a preparation-room next the lecture-room except for chemistry, although for other subjects they would be very convenient, and could usefully serve as stores. In the case of large departments it is customary to provide a second and smaller lecture-room with seats as galleries, but with less elaborate fittings. This is used for lectures to small classes, and for exercise-classes. *Class-rooms*.—In institutes for purely technical work, there is not a large demand for ordinary classrooms, except for such subjects as mathematics, exercise-classes, and for lessons without experiments. This, however, is not the case with the ordinary institute, and certainly not with polytechnics. My experience is that in

most institutes the number of ordinary classrooms is insufficient, and this point is especially important in view of the utilisation of the institutes for day-schools. For such work the provision of a sufficient number of ordinary classrooms is an absolute necessity. They need no special fittings beyond plenty of blackboard surface, a small platform and table for the teacher, and ordinary desks with seats or chairs for the students. The most convenient arrangement of seats is undoubtedly some form of dual desk, with sufficient space between each to allow of the teacher passing from student to student, as, although this is not required for languages and literary subjects, it is very desirable for mathematics and exercise-classes, and is a necessity for day-school work. This feature, which applies equally to lecture-rooms, is also important as permitting the room to be used for drawing-classes, or other subjects where individual attention is necessary, and for this reason we have at Battersea adopted short desks, with gangways between, in preference to long continuous desks, for the two lecture-theatres (Engineering and Physics) which we fitted last summer. We have six ordinary classrooms, two of which contain dual desks, with fixed seats, while four are fitted with long desks and chairs. Much of what has been said with reference to the size of lecture-rooms applies also to classrooms. For efficient teaching it is not advisable to exceed 30 or 40 in number. The former of these numbers is certainly a limit where the students require individual attention, and with only one teacher; whereas in other subjects, such as literature, theory of music, and shorthand, it is possible to take larger numbers, say, up to fifty, although these would be unusual numbers for such classes in the ordinary technical institutes. Classrooms should, therefore, vary in size to accommodate numbers from, say, 30 to 50, and if they do this they will meet all the ordinary conditions of both evening classes and day-schools. At Battersea an average is provided of from 12sq.ft. to 13sq.ft. per student, which has certainly proved to be ample. It is not possible to say how many such classrooms should be provided in any particular institute without knowing to what extent non-technical subjects will be taken, and the probable size of its day school. We should find it convenient at Battersea to possess two more such rooms than we have. Another point relating to the size of classrooms is worth considering. In the Science and Art Department examinations, which are usually the chief ones of the year, two superintendents are required for any number of students up to and not exceeding 50. The students must be spaced 6ft. apart in all directions, except for some art subjects. For the sake of economy it is not advisable to give less than 50 students to two superintendents, and this requires large rooms. Lecture-rooms with gallery seats are not accepted for examination purposes. At Battersea certain of the classrooms are divided by roller-shutters, and we have found it very convenient to be able to make these into one large room for examination purposes. I am, therefore, inclined to recommend the division of certain classrooms in this way, especially if double shutters with an air space between are fitted. *Workshops and Workrooms*.—I refer to these together because of the fact that the most important consideration affecting their size refers equally to both. It is becoming generally recognised and accepted that the number of students under one teacher in practical classes should not exceed fifteen, and here, then, is an important point to start from. The same workshop can seldom be used for more than one subject; if, then, there are, say, sixty students for practical plumbing, and a small workshop, and they are accommodated in four classes, the workshop is used on four evenings per week, whereas, if they are taken in two classes, the shop is standing idle for four working evenings each week. Extend this illustration to ten or a dozen workshops, and you will see how large a part of the building may be practically unused when the shops are of large size and the classes are small. As a practical instance of this, let me quote our position at Battersea, where we have one workshop unused on five evenings each week, six on four evenings, and two on two evenings, these nine shops alone covering an area of 5,960sq.ft. The question will naturally be asked: Why, then, not split the numbers to form a larger number of smaller classes? The reply to this is, that the rooms being already provided, the working expenses are less with large classes than



with small, owing to the fact that the second or third teachers are usually assistants who receive a less salary than the head teacher, whose presence is advisable in all the classes, and that the cost of fires, lights, preparation, &c., is less with, say, two large classes than with four small ones. There is also some difficulty in securing the services of the same teacher on more than three or four evenings per week. Another very important point is that in some practical classes, notably in brick-cutting, the work done by the students necessarily occupies considerable space, and cannot easily be moved from the bench to make room for the work of a student coming on some other evening. Hence in such a subject the use of the workshop by different classes on different evenings is not practically convenient, and if the students are large in number it is advisable to provide a large shop. This, however, does not apply in cases where the work is small and can be easily moved, as in plumbers' work, masons' work (unless work is executed full-size), fitting and machine shops, smith's shop, woodwork generally, and in electrical work. It does apply, though, to a less extent than in brick-work, to plasterers' work, and to painters and house-decorators' work. Very many of these remarks apply to workrooms for domestic economy and other subjects. There is, however, one important difference in the working of the classes which bears upon the size of the rooms. Workshop classes usually occupy the whole evening, the students receiving their theoretical instruction on some other evening and in larger classes. But in cookery, laundrywork, millinery, needlework, and dressmaking, the practical and theoretical instruction is given on the same evening, the latter being of the nature of a demonstration, and immediately preceding the former. There is, of course, no reason why a larger number should not be taken for the demonstration lesson; but this is not usually convenient, and the subjects are generally worked with classes of fifteen. Domestic economy workrooms are more available for several subjects than are workshops, as, for example, the same room can be used equally well for any of the needlework subjects. All shops and rooms for practical work should, therefore, be made large enough to accommodate fifteen students, or whole multiples of that number. It is obviously uneconomical to work such classes in numbers of, say, twenty or twenty-five, as two teachers would be necessary, and they could as easily take thirty. In view of day-school work, the fitting and machine shop and carpenters' should be large enough for at least thirty students. *Laboratories.*—The number of students allowed to one teacher in laboratory work is twenty; but it is usual to find laboratories with accommodation for larger numbers, owing to the fact that laboratory classes are usually preceded by a lecture, and that it is convenient to provide for the students who have attended the lecture to proceed immediately afterwards to the laboratory. The space per student in laboratories must be larger than in classrooms or even in workshops, as greater freedom is required for the passage of the teacher or student. It is customary to allow not less than 5ft. to 6ft. between tables or benches at which students are working back to back, each student requiring about 3ft. 6in. of bench length, and there should be ready access to sinks or cupboards to which students may frequently be required to go. Laboratories, like workrooms, are more usable than workshops, as, for example, a chemical laboratory can be used for hygiene, a natural science laboratory for botany, physiology, or biology, while a mechanical laboratory can generally be used for drawing. They are not, therefore, quite such sources of waste space as workshops. Laboratories are most economical in size when they provide accommodation for twenty, or for whole multiples of that number. It is common in technical colleges to provide a separate smaller laboratory for advanced work in the subjects of physics and chemistry; but however convenient these may be, they should not be regarded as essential unless, perhaps, in the case of chemistry, where the extra laboratory is necessary for some special work. *Mechanical Engineering Department.*—In the Appendix the laboratory is shown next to the lecture-room. The special object of this is to allow of apparatus being easily moved from one to the other, and to permit of the testing-machine which usually forms a part of the equipment of an engineering laboratory being placed in such a position as to be used for demonstration to large

classes seated in the lecture-room. This is not as important with day students, who have plenty of time for experimental work; but with evening students it is a valuable feature, as in lectures to large classes on strength and properties of materials, strength of beams and columns. I have secured this at Battersea by placing the testing-machine in the lecture-room on one side of the table and opening out into the laboratory; a screen placed around the machine allows it to be used by laboratory students without disturbing the class in the lecture-room, while the removal of the screen and the closing of the doorway between the laboratory and lecture-room permits of the use of the machine in full view of all the students in the lecture-room without disturbing students in the laboratory. The weight of such a machine for testing up to a maximum load of 10 tons, does not exceed 2½ tons, and does not require special foundations. It may thus be safely placed upon an upper floor when the same is built up of concrete on joists as is usual for workshops. A basement or ground floor is, however, preferable for an engineering laboratory, as it usually contains a small experimental gas, oil, or steam-engine, and other apparatus which require special foundations and drains. With one large laboratory all such apparatus should be placed in one part of the room, which should have a granolithic floor, due provision being made for drains; the remainder of the floor being boarded. More space is required for the lecturer in an engineering lecture-room than in other science subjects, owing to the larger size of the apparatus used in demonstrations. The engineering workshop would naturally be placed on the lowest floor, on account of the weight of the machines, and in settling the builder's details of this shop it is very necessary for the architect to arrange for the easy and efficient fixing of the overhead shafting. If the shop is chiefly lighted from the top, the vice benches would be best placed along the centre of the shop, and the machines ranged along each side, the operator being between the machine and the wall. In such an arrangement the main driving-shafts would naturally be supported by wall-brackets. If, however, the shop is side-lighted, the vice-benches would occupy the sides, and the machines the centre, and the shaft and counter-shafts would require fixing from the ceiling. About 5ft. of bench-length is required for each student, and the machines should not be nearer to the vice-bench than 4ft. 6in. or 5ft., with a like distance between each row of machines. Each forge in the smith's shop requires a floor-space of about 10ft. by 8ft. Smiths' shops are usually regarded as a part of the fitting and machine shop, and seldom contain more than four to six forges. *Drawing-Office.*—Work in a drawing-office comes under the rule which permits only twenty students to one teacher; but since drawing-classes are usually large in number, it is not advisable to provide accommodation for less than 30, a better number where the subject is important being 40. Each student requires about 2ft. 9in. of table length when using the usual half-imperial boards, and if not quite as convenient, long tables are, at least, as frequently fitted as separate tables. A drawing-office should contain a lecturer's table with plenty of blackboard surface at one end. It must be well lighted, and for this reason is frequently placed on the top floor where a top light can be secured. *Pattern-shop.*—If a separate pattern-shop is required, it need not be larger than for 15 or 20 students, as the numbers for pattern-making classes are invariably small. Its fittings are almost identical with those of an ordinary carpenters' shop, with the addition of one or two turning-lathes. *Building Trades' Department.*—It is customary to treat mechanical engineering and building trades as one department—a union naturally suggested by the fact that so many subjects are common to both, and that some of the workshops for building classes (those requiring power) are almost of necessity placed next to the engineering workshops. Then again, it is usually found convenient to group all the workshops together in one part of the building, and when this is done it may not be possible to place the building lecture-rooms and drawing-office near to the workshop. But this separation need not be regarded as inconvenient, owing to the fact that the workshops embracing so many distinct trades are necessarily under the charge of different teachers, whereas in engineering, the whole department is smaller and is more usually under the general supervision of one person, and a wide separation

of its different rooms is objectionable. In many institutes the classes in practical geometry and building construction are held entirely in the drawing-offices, whereas, at other places, and as at Battersea, the classes meet in lecture-rooms for a descriptive lecture, the actual drawing being done afterwards in the drawing-office or at home. Such different methods of teaching would be fully met by arranging the lecture-room with single or dual desks wide enough to allow of drawing-boards being used, and fixed on the floor-level with the teacher on a well-raised platform at one end. This would serve equally well for a drawing-office or lecture-room, the only objection being that the desks would be of the ordinary table height, and lower than proper drawing-tables. *Size of Workshops.*—A shop fitted for carpenters' and joiners' work may be used equally well by pattern-makers or cabinet-makers, and we find no difficulty in such an arrangement at Battersea. A bench 6ft. 6in. by 2ft. 8in. gives ample room for two students, whether junior or senior. In fixing the position of the shops for painters and plasterers, it should be remembered that they are both subjects (especially the former) to which the application of the principles of form, colour, and design are very desirable. This can be gained by placing them near to the Art Department, not necessarily as a part of it, but in order that the Art Master may pay occasional visits and influence, by precept and example, the work done. In the case of the shops for masons, plasterers, and painters, there is nothing in the character of the work being done to prevent the theoretical or drawing lesson taking place in the workshop, and economy of space would be preserved by arranging tables for drawing at one end of the shop, or in the centre portion, with the work-benches at the other end or around the walls. It seems desirable to give more room for a plasterers' class, especially if the students are to undertake builders' plastering. It would probably be possible, with care, to use the plumbers' shop for metal-plate work; but it is not usually recommended. The shops for carpentry, brick-cutting, and plumbing should be on the basement or ground floor, as affording the best facilities for the passage of materials, and the same would apply to the masons' shop, if the work is done full size.

(To be continued.)

#### CHIPS.

The committee of West Berwickshire County Council have appointed Mr. Robert Paterson, Rothbury, road surveyor of the western district of Berwickshire, in room of Mr. William Tait, who was recently appointed road surveyor of the Stranraer district of Wigtownshire.

The McMath wash-hand troughs have recently been fitted in schools in the following towns:—Birmingham, Sheffield, Nottingham, Gateshead, Swansea, Dundee, Arbroath, Glasgow, Kilmarnock, Grangemouth, &c. Messrs. Enley and Sons, Limited, Newcastle-on-Tyne, are the sole proprietors.

The Dae Conservancy Board, at its annual meeting in Chester on Thursday, decided, after hearing a report by Mr. H. Enfield Taylor, C.E., to petition against the Bill of the Chester Corporation for erecting a dam and sluices across the Dae. The Bill, it transpired, was arousing much opposition.

We are requested to state that the arrangements are now complete for lighting, in the evening, the Southern Galleries of the South Kensington Museum on the west side of Exhibition-road, which contain the collections of machinery and naval models. These galleries will be open free to the public from February 17th on three evenings a week—Mondays, Tuesdays, and Saturdays—till 10 p.m., in the same manner as the main building.

The Walsall and General Hospital, Walsall, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke-flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Works of sewage disposal, carried out at a cost of £7,500, were formally opened at Horfield, near Bristol, on Monday. They have been carried out from plans by, and under the supervision of, Mr. A. P. I. Cotterell, surveyor to the Horfield urban district council.

The Keighley Rural District Council, in order to provide a system of sewage treatment for Morton and Morton Banks, have approved of the purchase of ground near Sandbeds, eight and a quarter acres in extent, for £1,300, and Messrs. B. Hopkinson and Co., Keighley, were instructed to prepare plans.



## CONTENTS.

Can the Contract System Last ?	227
Methods of Building	227
County Lunatic Asylums.—XXXIX.	228
Dudley Gallery Exhibition	230
The Architectural Association	230
Graphical Determination of the Stresses in the Members of a Collar-Beam Roof-Truss.—IV.	231
The British Art Gallery, Millbank	231
Cast Iron in Builder's and Contractor's Work.—XVI.	232
The Timbers of Australasia.—III.	233
Notes on Domestic Drainage.—II.	234
Technical Institutes	234
The Building News Directory	237
Our Illustrations	237
Engineering Notes	237
Competitions	256
The Passmore Edwards Free Library, Liskeard	257
Disinfecting Sewage by Chlorine	257
Callender's Pure Bitumen Damp-Course	257
Books Received	258
Obituary	258
Building Intelligence	259
Architectural and Archaeological Societies	259
Correspondence	259
Intercommunication	260
Legal	260
Legal Intelligence	260
Water Supply and Sanitary Matters	260
Our Office Table	261
Meetings for the Ensuing Week	261
Tenders	263

## ILLUSTRATIONS.

"WORCESTER CATHEDRAL."—DESIGN FOR A LARGE TOWN CHURCH.—DESIGN FOR A RIVERSIDE WAREHOUSE.—SECKFORD HALL, WOODBRIDGE.—HOUSE AT COLWYN BAY.—PASSMORE EDWARDS FREE LIBRARY, LISKEARD.—BUSINESS PREMISES, SOUTH SHIELDS.—CLUB SMOKING-ROOM FIREPLACES.

## Our Illustrations.

"WORCESTER CATHEDRAL," BY JOHN POWELL.

ALTHOUGH John Powell was an English landscape painter, there is something very Dutch in his handling of this excellent view of the Cathedral at Worcester as seen from the river, and which we have reproduced to-day from one of the four examples of his skill which are located in the picture galleries at South Kensington Museum. Powell was born about 1780, and before he was twenty we find he exhibited at the Royal Academy, to which he continued to contribute for over thirty years, the last occasion being in 1829. As a drawing master he had an extensive connection, and is known for his tree etchings. His landscapes are executed chiefly, however, in water-colour. When the old Water-Colour Society was founded, Powell was an unsuccessful candidate for membership. Comparatively little is known of him beyond these few facts, but his drawings were always refined and marked by an artistic thoroughness and care deserving of emulation. The specimen chosen by us to-day shows Worcester Cathedral before it was spoiled by over-restoration, and the view records, too, the immediate surroundings of the church at the time the sketch was taken. Messrs. Dixon and Son, of Albany-street, specially photographed the original picture for our pages.

ROYAL ACADEMY GOLD MEDAL COMPETITION.—DESIGN FOR A LARGE TOWN CHURCH.

THERE is nothing to add to what has been already said about this capital design from the Royal Academy by Mr. T. Geoffrey Lucas. The plan and west front appeared in our pages for January 24th, and the interior perspective was given by us in our Double Number on January 3. We now complete the series of our reproductions by publishing the longitudinal section, which well illustrates the clear and able draughtsmanship of the author, to which a reference was made at the time of the competition. An ample field is afforded for colour decoration, and the requirements of a church for worship have been well considered.

NATIONAL SILVER MEDAL DESIGN: A RIVERSIDE WAREHOUSE.

THE walls are intended to be constructed of local tooled stone, in varying courses, and small red bricks; the roofs to be covered with grey-green slates; the down-spouts and rain-water heads to be of lead; the windows to have wooden frames and glazing-bars, painted white. The ground area, which is raised so as to be level with the floors of carts on the wharf, consists mainly of the packing-room. The first floor is entirely taken up by offices. The two upper floors are

lighted mainly by means of a skylight, the light passing through a well-hole in the top floor.

EDWIN F. REYNOLDS.

SECKFORD HALL, NEAR WOODBRIDGE.

THOMAS SECKFORD, master of requests in the reign of Queen Elizabeth, built this old house, which for many years has been little better than a ruin. The hall was at one time a fine mansion, but for a very considerable period was occupied as a farmhouse. There is not much to say about the place beyond its charm of colour and situation, in one of the most delightful parts of Suffolk. The stepped gables are typical of East Anglian domestic work, as at Wilby Hall, near Thetford, and many another house in the Eastern Counties which could be mentioned. Seckford was a great man in his day, and a liberal benefactor for after-generations. He left, in 1578, much property in Clakenwell to endow his charities at Woodbridge, where he lies buried in a chapel erected by himself on the north side of the chancel of his parish church. Mr. Dudley Arnott, of Gorleston, photographed our view given to-day, and we are indebted to him for it.

HOUSE AT COLWYN BAY.

THIS house is in course of erection, for Mr. John Brock, in the Nant-y-Glyn valley about one mile from the Colwyn Bay railway-station. It stands on sloping ground, and commands some extensive views of the country on the south and east, with a glimpse of the sea towards the north, whilst the woods on the west afford shelter from the prevailing strong winds. The work has been carried out by Mr. John Roberts, contractor, of Colwyn Bay, from the plans of Messrs. Booth, Chadwick, and Porter, architects, of Manchester, Colwyn Bay, and Rhyl.

THE PASSMORE EDWARDS FREE LIBRARY, LISKEARD.

(See article and block plans on p. 257.)

NEW BUSINESS PREMISES, SOUTH SHIELDS.

THESE premises contain on the ground floor two large and well-lighted shops, with stores and conveniences in the rear. The upper floors are planned as a separate dwelling-house, but can be connected with either shop or ground floor if desired. The elevations have been faced with Messrs. Lawson best quality red facing bricks. The dressings and moulded work are of stone and Edwards's terracotta. The shop-fronts have been carried out in mahogany. For the roofing, the best Westmoreland green slates have been used. The works have been carried out by Mr. T. S. Winter, contractor, of South Shields, and the architect is Mr. Henry Grieves, A.R.I.B.A., of the same town.

CLUB SMOKING-ROOM FIREPLACES.

WE illustrate on the same page two chimney-pieces of simple design, yet both showing a certain freshness and effectiveness in treatment. The lower one on the drawing is from the Baltimore Club House, Baltimore, of which Messrs. J. A. and W. T. Wilson were the architects. In this case the plainly-panelled overmantel is carried up to the plaster cornice of the room. Attention should be directed to the novel treatment of the brackets on jambs of mantel, which completely divide the moulded shelf. The broad use of marble beneath adds not a little to the dignity and character of the whole. In the fireplace, illustrated on the upper portion of the drawing, the fire opening is a complete semicircle, with an arch of thin bricks turned over the same. The moulding, carved panel in overmantel, and the bracket-like ends of the shelf are in stone, the rest of the work being executed in glazed brickwork. This example is from the University Club House, Philadelphia, of which Mr. Wilson Eyre, jun., was the architect. The interiors in which these fireplaces occur were illustrated in the *American Architect*.

The town council of Ossett decided on Monday to instruct Messrs. Holton and Fox, architects, of Dewsbury, to proceed with the preparation of plans for a new town-hall.

The Local Government Board have decided to sanction the scheme put forward by the corporation of Richmond and the district council of Heston and Isleworth, for the establishment of a joint isolation hospital on a site covering  $9\frac{1}{2}$  acres, near the Isleworth sewage farm. The scheme, which will cost about £5,000, was the subject of a Local Government Board inquiry last August.

## Engineering Notes.

THE WATERLOO AND CITY RAILWAY.—At the fourth half-yearly meeting of this undertaking, the engineers, Messrs. Galbraith and Greathead, report that towards the City the tunnels had now reached a point in Queen Victoria-street nearly opposite St. Nicholas Church, the distance driven in six months being 530 yards of double tunnel. These tunnels had been driven under the low-level sewer, the Metropolitan Railway, and Queen Victoria-street, without mishap, in the solid London clay, and the rate of progress was 73ft. per week. The City Station would probably be reached in June next. Towards Waterloo the tunnels had encountered ballast and water, and had to work under compressed air, so that the progress was much slower. Average distance of tunnels from the crossing of the Waterloo-road, about 120 yards; present rate of progress, only about 23ft. per week; length of double tunnel driven in this direction since the last half-yearly report, 300 yards. The contracts for the low-level station at Waterloo have been let at the engineer's estimate, and the works have been commenced. Sixty-nine per cent. out of the total length of tunnels between Waterloo and the City has now been driven.

## CHIPS.

The Bradford Corporation are applying to the Local Government Board for power to borrow the sum of £40,000 required for the extension of the electricity works.

The Bute Docks Company have withdrawn their deposited Bill for next Session. The Bill sought powers to enable the Bute Docks Company to construct over 49 miles of railways in connection with their docks at Cardiff, to be constructed principally along the beds of the Glamorganshire and Monmouthshire canals. The amount of share and loan capital required for this scheme was £1,330,000.

The collection of fossil plants of the coal measures formed during a period of nearly forty years by the late Professor W. C. Williamson, professor of botany in Owens College, has been obtained by the British Museum. The collection furnished the materials and illustrations for Professor Williamson's great work "On the Organisation of the Fossil Plants of the Coal Measures," published by the Royal Society during the period 1881 to 1892, and for his researches and investigations in the study of the vegetation of the Coal period.

The directors of Aberdeen Royal Infirmary have resolved to proceed with the erection of a new convalescent hospital at a cost of upwards of £4,000. The site acquired is at Hulhead of Pitfodels, about four miles from the Infirmary, and the architect is Mr. William Kelly, of Aberdeen.

Mr. Thomas Barker Sanderson, J.P., estate agent, Morley-street, Newcastle-on-Tyne, has been elected an alderman of that city. He served as sheriff last year, has been for 15 years a member of the corporation, and is vice-chairman of the improvement committee.

The Wallasey District Council have resolved to purchase and lay out as a park a piece of land on the foreshore at New Brighton, 16,540 square yards in area, at an estimated cost of 9,552.

There was a heavy decline in the amount of business transacted at the Estate Mart last week, the aggregate being only £31,530, as against £56,184 recorded for sales in the previous week.

The city council of Liverpool have taken a further step towards the removal of the black spots which disfigure that town. They have decided, on the advice of Dr. Hope, the medical officer of health, to demolish 244 small houses situate in various courts and slums, on account of their insanitary character.

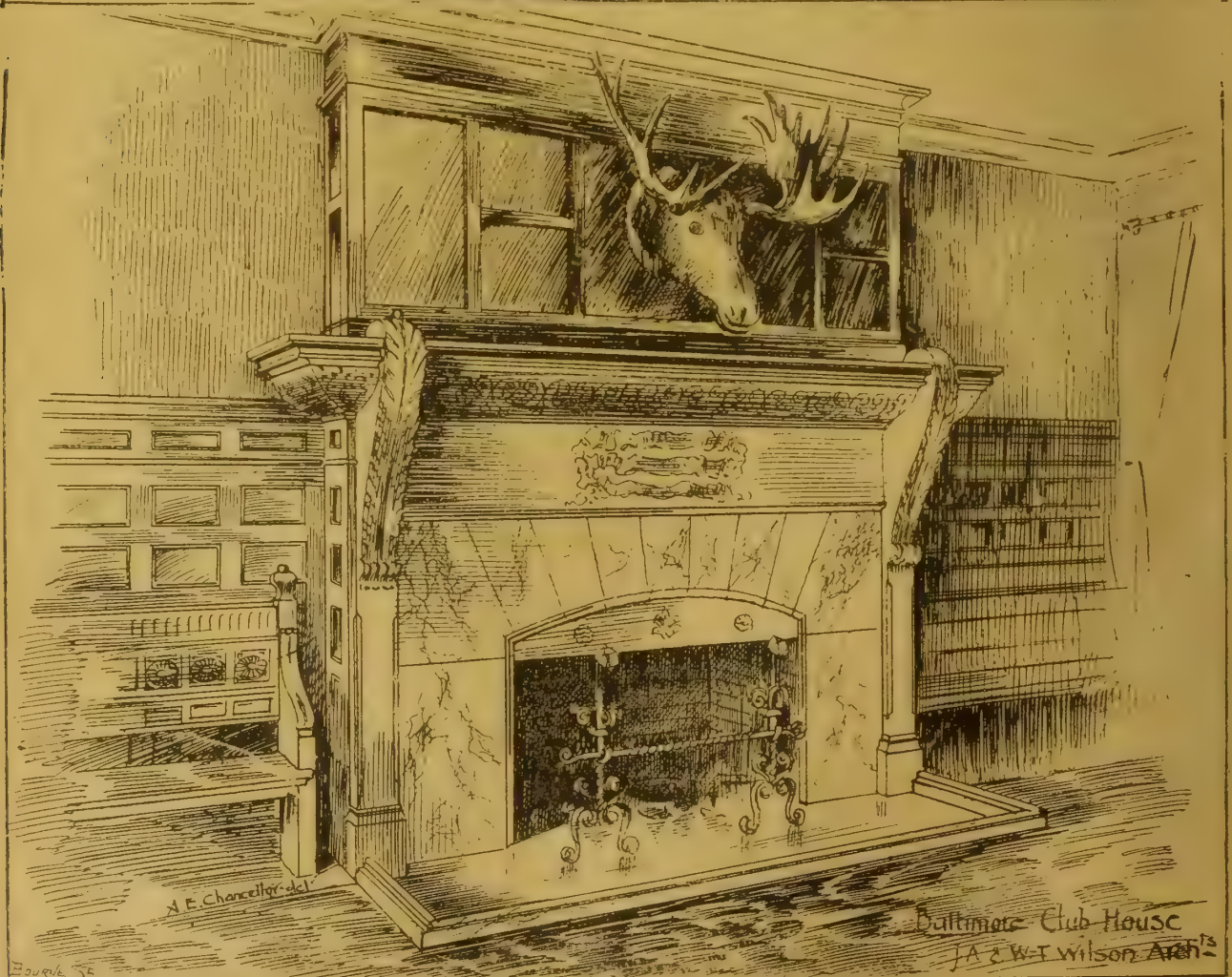
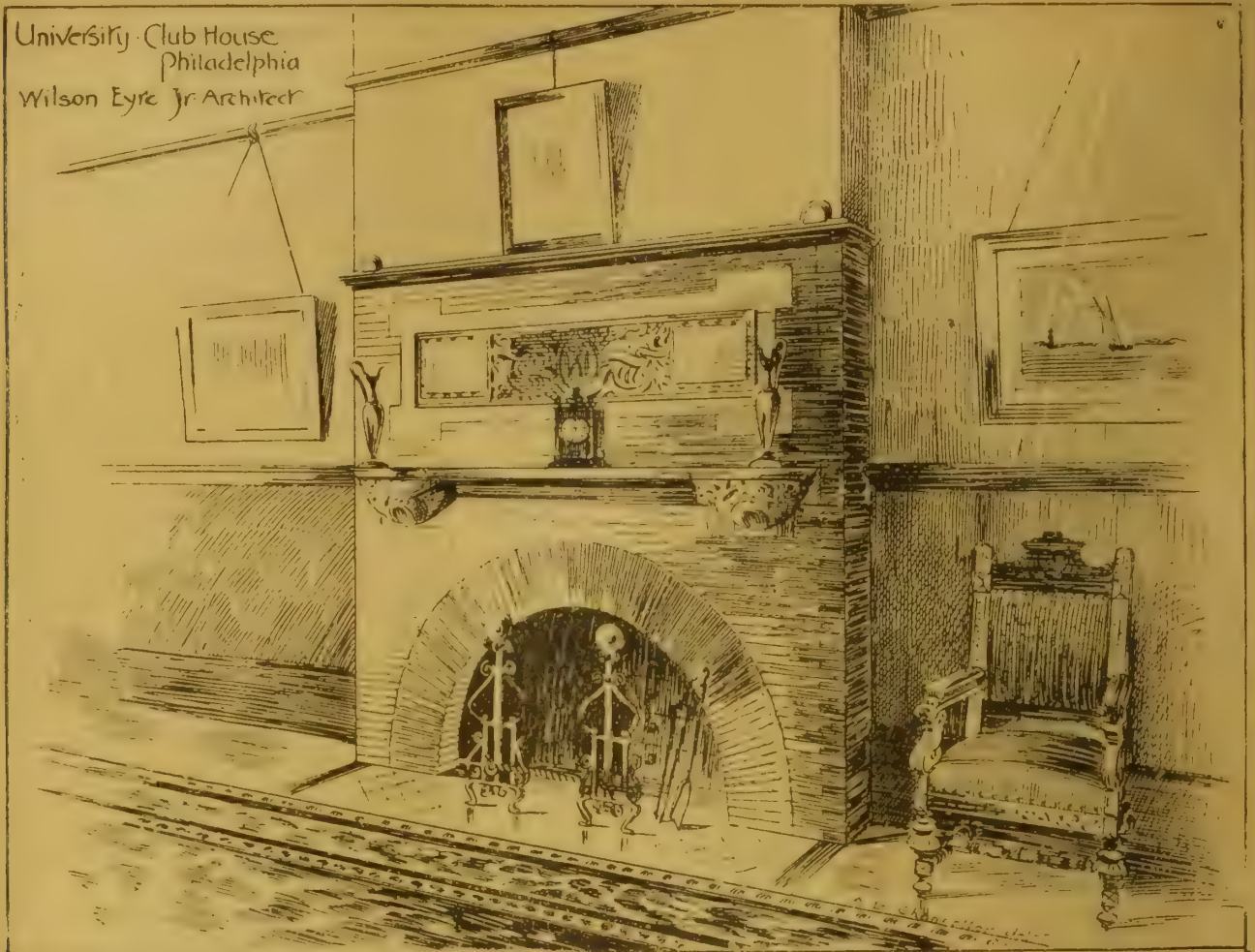
Mr. Thomas Smith, builder, of Leeds, died at his house in Brunswick-terrace, in that city, on Friday last, aged 63 years. He had for the last sixteen years been a member of the city council, and had been an alderman since 1892. He was chairman of the building clauses committee of the corporation, and was also a member of the Leeds board of guardians and other public bodies.

The Duke and Duchess of York will open the new infirmary at Lancaster, built at a cost of £23,000, from designs by Messrs. Paley, Austin, and Paley, of that town, at the end of March. This is the first Royal visit since the Queen visited Lancaster in 1852.

The annual meeting of the Glasgow and West of Scotland Technical College was held in the Technical College, Bath-street, Glasgow, on Friday afternoon. A letter of resignation was read from Mr. John Honeyman, R.S.A., one of the Governors.



University Club House  
Philadelphia  
Wilson Eyre Jr Architect



CLUB SMOKING-ROOM FIREPLACES.





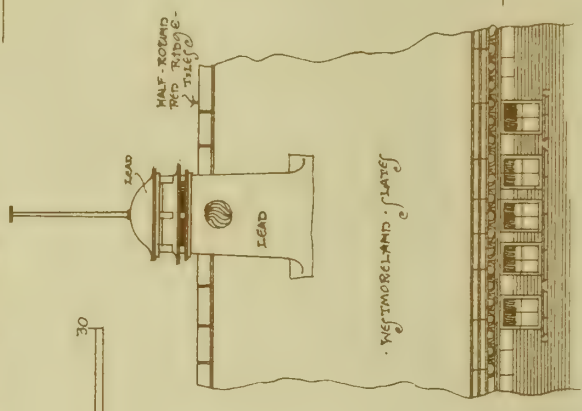


# Design for Riverside Warehouse



SCALE IN FEET.

MAIN STREET.

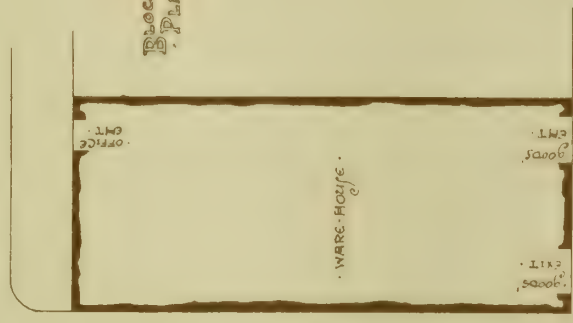


HALF-ROUND RED RIDGE & SLATES

LEAD

WETMORELAND SLATES

BLOCK PLAN.



WAREHOUSE

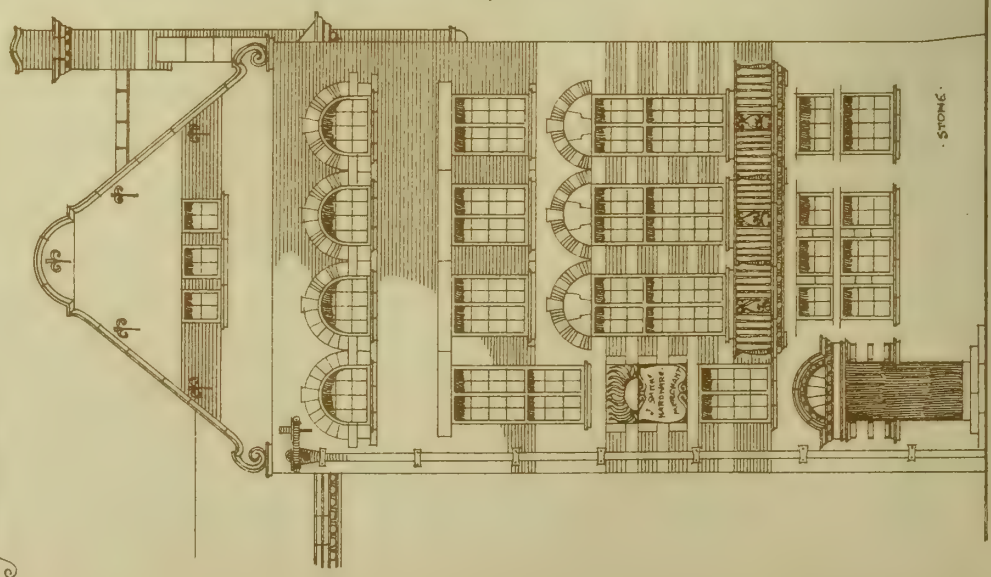
OFFICE

ENTRANCE

WATER

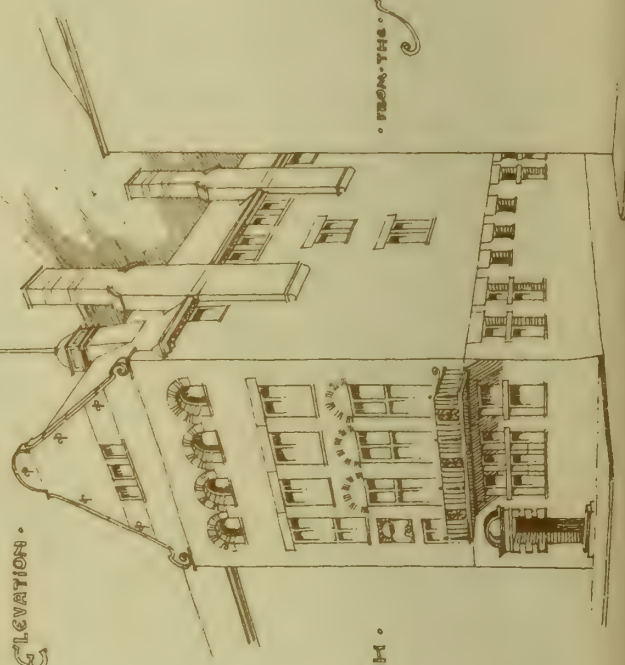
WHARF

PART SIDE ELEVATION



STONE

SKETCH



FROM THE STREET

ELEVATION TO STREET

ELEVATION TO RIVER

BIRMINGHAM  
SCHOOL OF ART

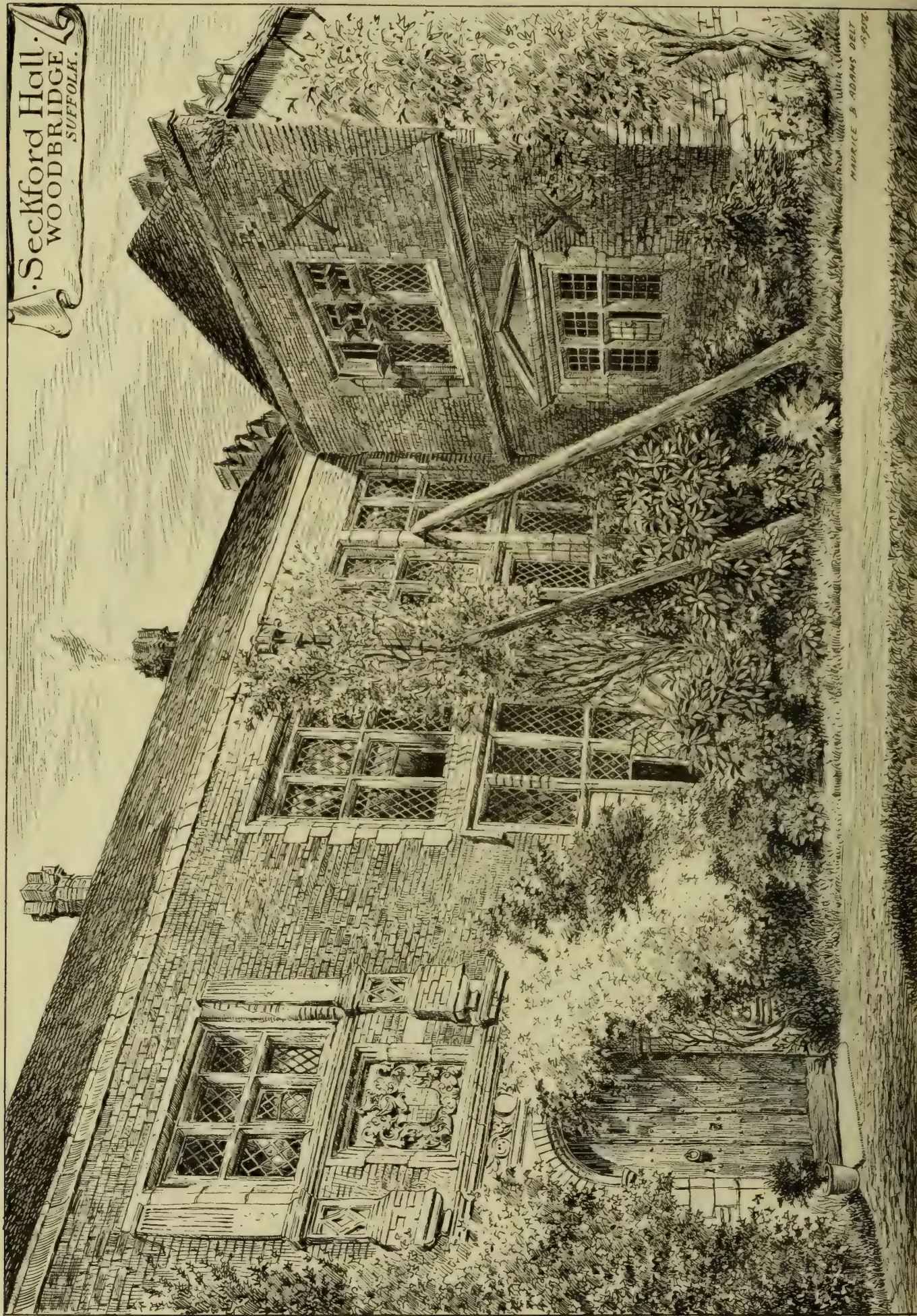
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Seckford Hall.  
WOODBRIDGE  
SUFFOLK.



MAURICE B ADAMS DELT

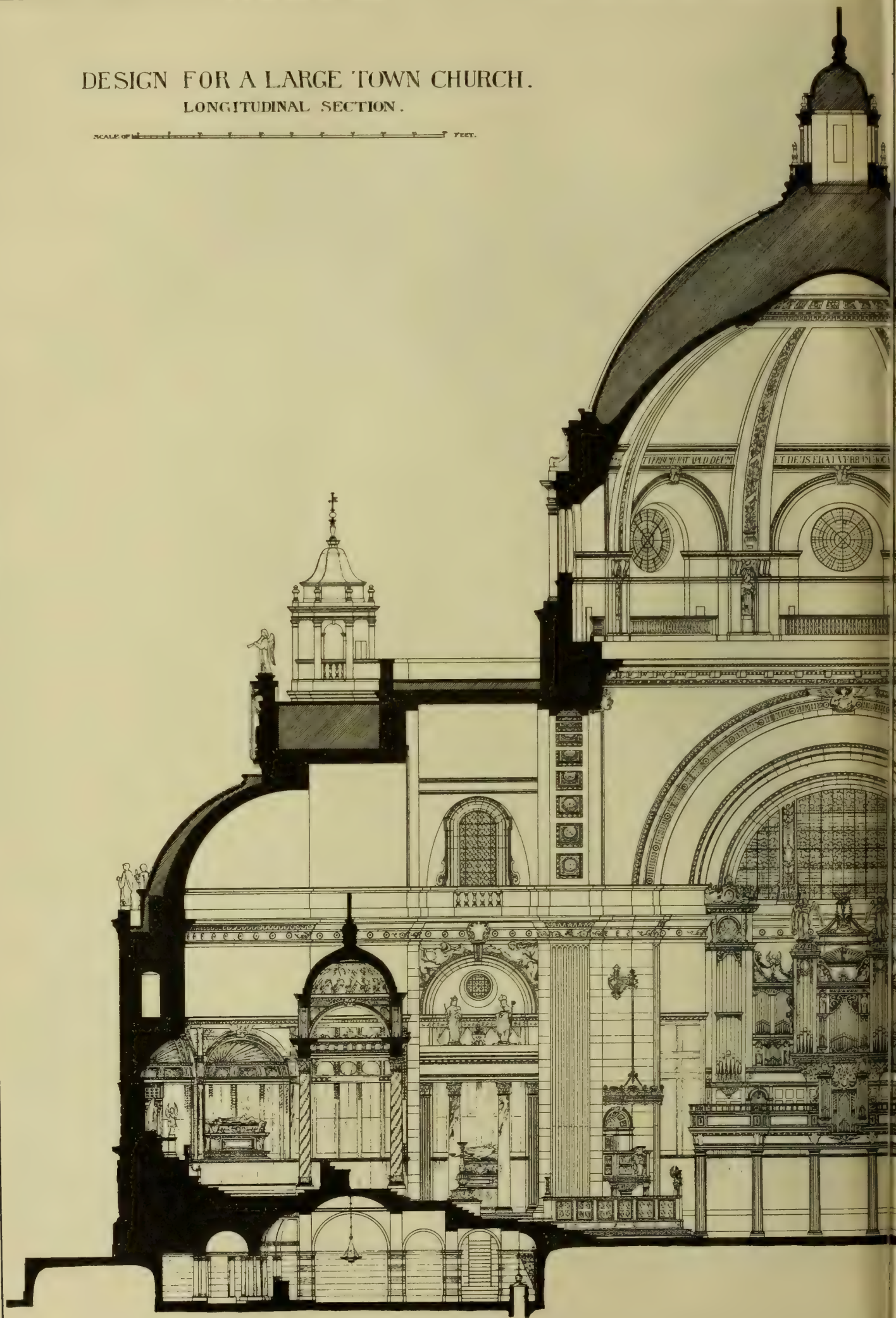






DESIGN FOR A LARGE TOWN CHURCH.  
LONGITUDINAL SECTION.

SCALE OF  FEET.

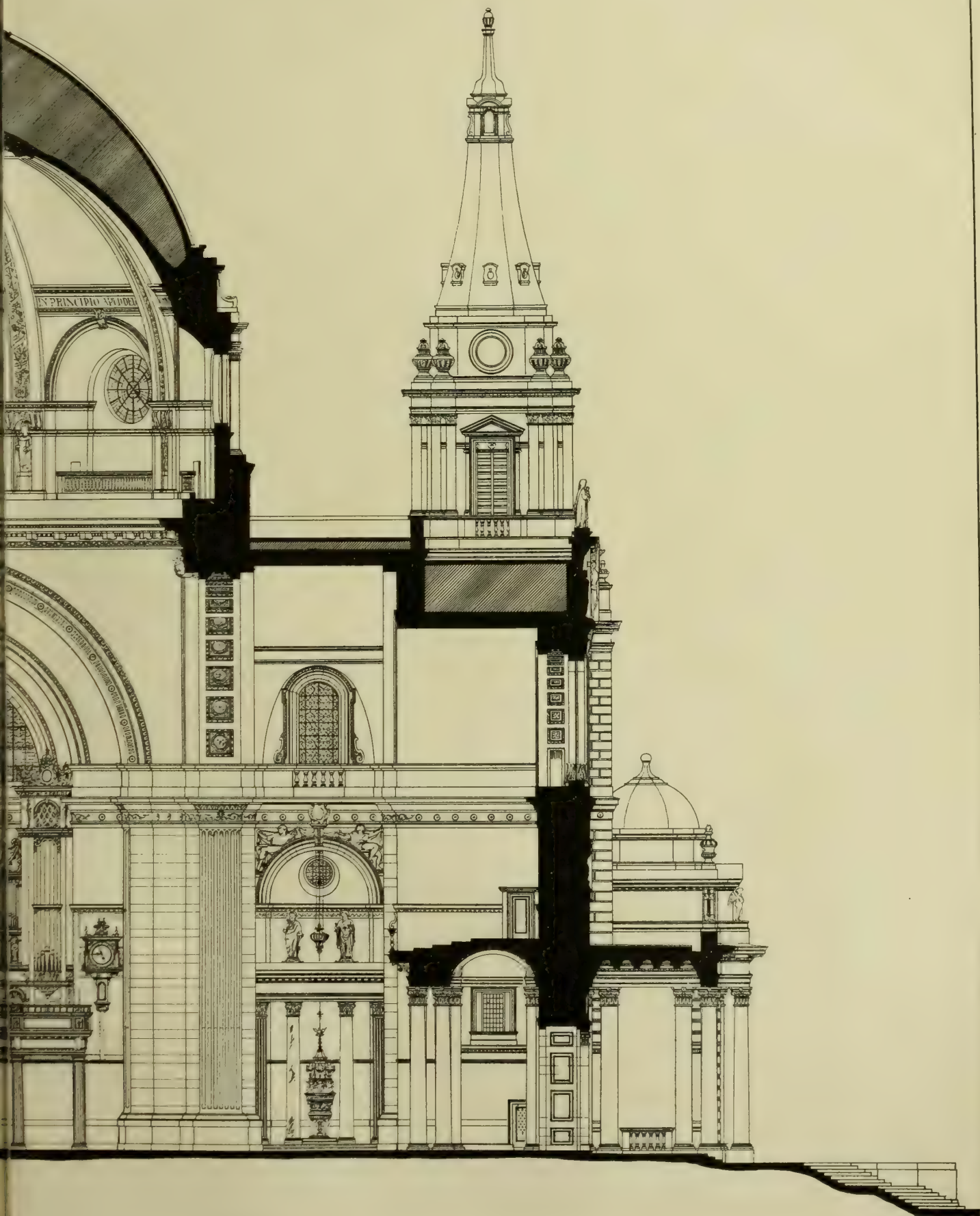




FEB. 14, 1896.

ROYAL ACADEMY GOLD MEDAL COMPETITION.

BY THOMAS GEOFFREY LUCAS.













THE BUILDING DEWS. FEB. 14, 1896.







PHOTO TAKEN BY ALFRED A. GRIFFITHS, LONDON, W.C.

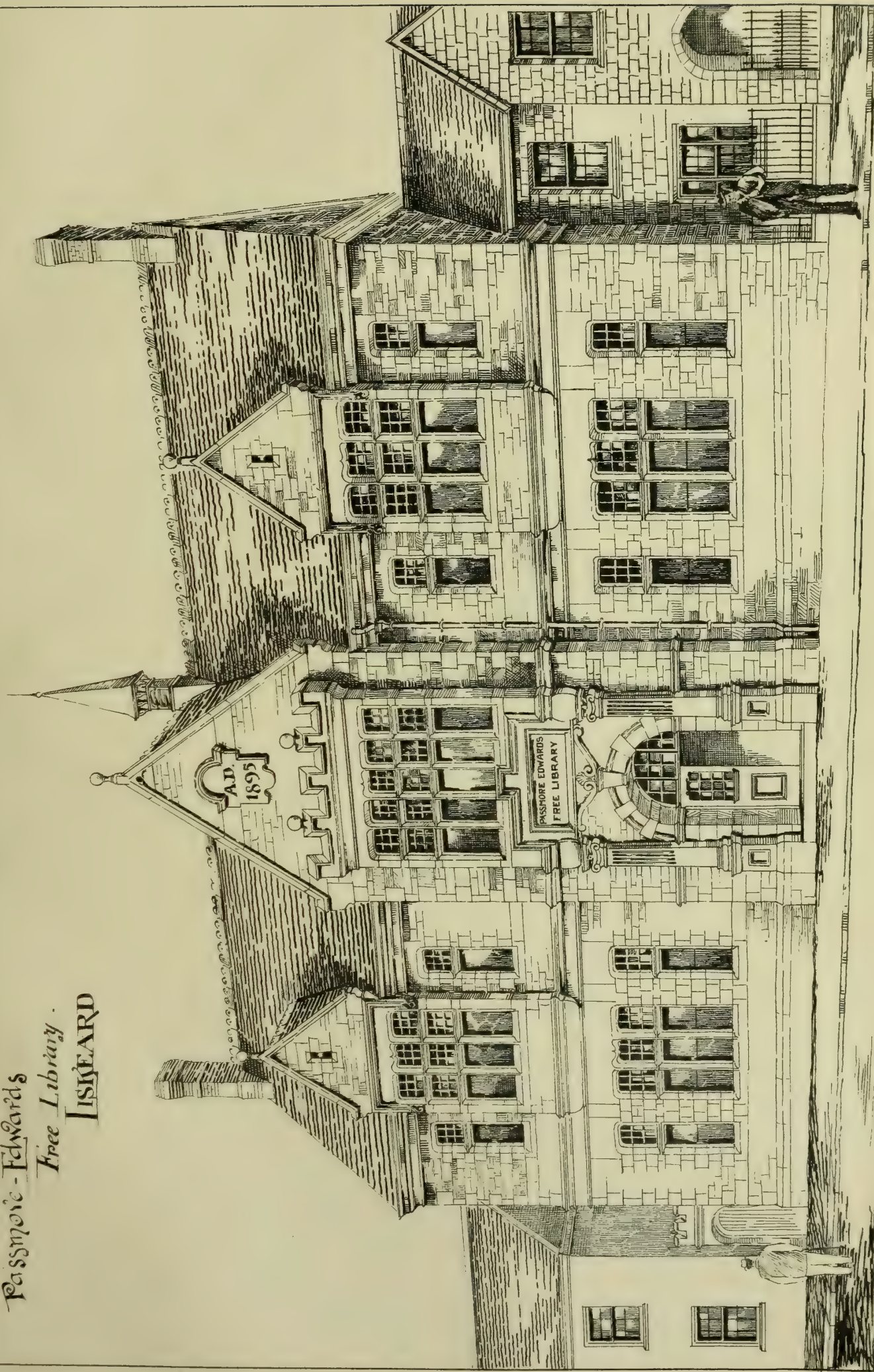
WORCESTER CATHEDRAL BY J. POWELL







Pasmore-Edwards  
Free Library.  
LISKEARD











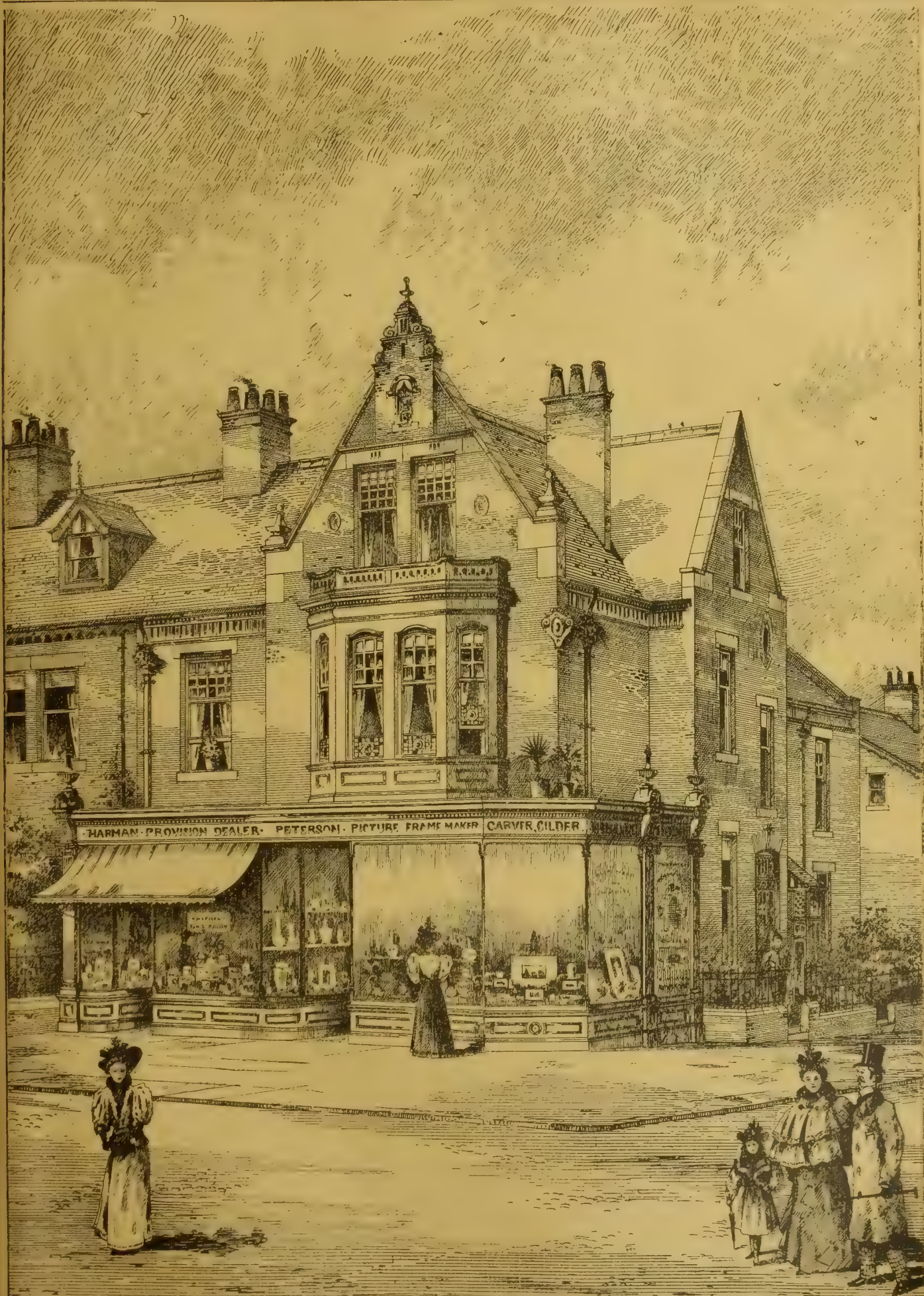
HOUSE AT COLWYN BAY, N WALES. MESSRS BOOTH, CHADWICK & PORTER ARCHTS

"PHOTO TINT" BY "THE ARTIST" FOR "THE BUILDING NEWS"









H. CURRI

BUSINESS PREMISES • SOUTH SHIELDS • HENRY • GRIEVES. ARIBA. ARCHE



## COMPETITIONS.

EXETER.—A difference of opinion has arisen between the building committee for the new church of St. David, Exeter, and their assessor, Mr. James Brooks, V.P.R.I.B.A. It has been stated that the committee originally consulted a local architect, Mr. James Jerman, and, after ascertaining his views, invited two architects practising in London and three at Exeter to submit plans in a limited competition. One of the London architects, Mr. G. H. Fellowes Prynne, declined to compete. The other architects who competed were Mr. W. D. Caröe, of London; Mr. Jerman, of Exeter; Mr. Harbottle Reed, of Exeter; and Mr. C. J. Tait, of Exeter. Mr. James Brooks, of London, was called in as an assessor, with instructions to report upon the plans which were presented, one condition in the competition being: "The assessor will advise the committee of the comparative merits of the designs, and the committee will select one which in due course, so far as funds permit, they will proceed to carry out, providing the contract price of £12,000 is not exceeded." Mr. Brooks's report placed the design by Mr. Caröe first, and that by Mr. Jerman second. Mr. Caröe proposes that the church should be faced with Bath stone, and, Mr. Brooks estimating the cost of the work at 6½d. per cube foot, says the church can be erected for £11,700. Mr. Jerman's church would be constructed of limestone. He, estimating the cost at 9d. per cube foot, says the church can be built for £11,300. When the matter came before the building committee, a question was raised as to whether Bath stone was desirable, and also as to whether such a church could be erected for 6½d. per cube foot. The matter was adjourned, in order that the committee might get some further information. "Seemingly, some communication has been made (according to the *Devon and Exeter Gazette*) to the Royal Institute of British Architects, and to the London Architectural Association, with the view of bringing pressure to bear for the purpose of inducing the committee to act upon the opinion of the assessor. The extraordinary course has been taken by the council of the Royal Institute of British Architects and the Architectural Association of addressing letters to various persons connected with the erection of the new church." The following letters are reprinted by our local contemporary as having been received respectively by the Vicar of St. David's and the representative of the local architectural society upon the council of the Institute (a post filled, according to the *R.I.B.A. Calendar*, by Mr. Jermain himself):—

The Royal Institute of British Architects,  
9, Conduit-street, Hanover-square, W.,  
4th February, 1896.

Sir,—At a meeting of the Council of the Royal Institute of British Architects, held yesterday, Mr. James Brooks, a Vice-President of the Institute, referred to the recent competition for St. David's Church, Exeter, in which he acted as assessor, and to certain action taken by the Building Committee, of which you are the chairman, with regard to his award. The Council, after hearing his statement, passed a resolution, as follows:—

"The Council of the Royal Institute of British Architects, being desirous of upholding in all cases the purity of competitions, and learning with regret that an attempt is being made to upset the decision of the assessor in the St. David's Church (Exeter) competition without cause being shown that the selected design should not be carried out, venture to impress upon the Building Committee the importance of supporting the assessor, as the only just method of reaching a conclusion, more especially when the design placed first is stated by the assessor to be pre-eminently the best submitted, and in which all the conditions of the competition have been faithfully observed."

I have been directed to send a copy of the above to the Hon. Secretary of the Devon and Exeter (Allied) Society, as well as to you, and I have the honour to remain, Sir, Your obedient servant,

WILLIAM H. WHITE, Secretary.

The Rev. E. J. V. French, St. David's Vicarage, Exeter.

The Architectural Association,  
56, Great Marlborough-street,  
London, W.

My dear Sir,—You will understand that we at the A.A. have taken very considerable interest in the competition, now about to be decided, for the new church at Exeter. Our President and one of our Vice-Presidents are competitors (or were invited to be), while you represent your local Society upon the Council of the Institute.

From the Exeter papers I learn that Mr. Brooks has been awarded strongly in favour of the design marked B, but that certain members of the Committee are endeavouring to upset his award in favour of some other competitor. Now, Mr. Brooks is a V.P. of the Institute, and a man of great authority in matters of church design. It behoves us, therefore, to uphold his decision to the fullest extent of our power. I speak now as a member of the Council of the R.I.B.A.

May I ask you to exert your considerable influence in the same direction, and to inform me of anything of importance that occurs bearing upon the competition?

Believe me to be, sincerely yours,

E. D. W. MOUNTFORD.

The publication of these letters in the Exeter newspapers has opened the floodgates for a torrent of correspondence. The Rev. C. J. Valpy French, the vicar of St. David's, has replied to the secretary of the Royal Institute of British Architects, protesting against the suspicion that the committee would allow their judgment to be distorted by improper pressure from without; he points out the lack of courtesy manifested in communicating to parties other than to those to whom the warning of the council was addressed a copy of the resolution adopted by the Institute, aggravated as it was by the "still graver discourtesy" of sending the resolution to the Press before it could even be laid before the sub-committee. Mr. French further explains that the building committee "did not invite Mr. Brooks to make an award or to give a decision"; but asked his advice upon technical questions, and "this duty Mr. Brooks most ably and loyally discharged." The advice tendered commended itself to the judgment of the committee, who accordingly reported in favour of the design of Mr. Caröe. When this recommendation was submitted to the general committee, a question arose as to the material for the outer walls—limestone being considered better than Bath stone. On this point the question has been referred back to the building committee for further consideration. Mr. E. W. Mountford has written a further letter, in which he complains that his private communication to Mr. Jerman should have been published, and declares that the letter from the Secretary to the R.I.B.A. "is certainly inaccurate and misleading." Mr. Mountford avows himself the drafter and proposer of the resolution passed by the council of the R.I.B.A., and says his "only object is to support the majority of the building committee in their desire to do justice to my friend, Mr. Caröe, whose design has been placed first in the competition." He adds that the eminent West Country builder who gave the estimate for Mr. Caröe's design has since expressed his willingness to use limestone instead of Bath stone for the same money. Mr. C. H. Brodie, A.R.I.B.A., of Bloomsbury, and formerly of Exeter, points out that the assessor is in the foremost rank of church designers, and "a man, moreover, whose judgment in such a matter would be accepted without question by every architect worthy of the name in the kingdom.... There is not the slightest indication of 'dictation,' and to refuse to act on the opinion of their professional adviser at this stage is for the building committee absolutely to stultify itself." Parishioners and members of the building committee have eagerly thrown themselves into the fray. Some advocate the abandonment of the whole scheme, towards which it seems only £6,000 has been promised, and the patching-up of the existing church; while one writer quotes from a leading article on the Belfast Cathedral which appeared in the *Building News* for Oct. 18, 1895, the keynote of his citation being the sentence: "The inner ring of church architects have had things too much their own way; it is time that outsiders were permitted to show whether they are outside by desert or only by accident." We have not seen either of the designs, nor do the local journals appear to have attempted to compare or criticise them; but the general tenor of the correspondence suggests that the injudicious action of the council of the R.I.B.A., and of Mr. Mountford, is likely to convert the building committee into ardent champions of the local architect, entirely without regard to any artistic merits his design may or may not possess.

LIVERPOOL.—An important competition has been determined during the past week, Mr. R. Norman-Shaw, R.A., being the assessor. The subject of the undertaking is a new building for the Royal Insurance Company, to be erected on the site of their existing offices in North John-street and Dale-street, Liverpool, at a cost of about £40,000. The selected architect is Mr. J. Francis Doyle, 4, Harrington-street, Liverpool; the second premium has been awarded Mr. E. W. Mountford, London; and the third to Messrs. Woolfall and Eccles, of Liverpool. The other competitors were Mr. J. Belcher London; Mr. T. E. Collcutt, conjointly with Mr. A. N. Prentice, London; Mr. Francis Holme and Mr. W. Aubrey Thomas, of Liverpool. The selected design is Renaissance in character, with Georgian and Flemish details.

WILSHPOOL COUNTY INTERMEDIATE SCHOOLS.—In this competition the winner of the 20 guineas

premium is Mr. Frank H. Shayler, architect, Welshpool and Oswestry; second place, Mr. H. Teather, architect, 65, Alexandra-road, Cardiff; third place, Mr. Charles Heathcote, architect, 6, Princess-street, Manchester. There were 25 competitors. Messrs. Woodhouse and Willoughby, the assessors, report that two other designs especially merit recognition on account of the ability displayed by their authors. These are signed "Education," and "Fredk. B. Bond, Bristol." The limited expenditure at command precludes each of these admirable schemes being entertained on account of their cost, otherwise they would have felt warranted in giving them a place in their assessment.

## CHIPS.

The corporation of Bacup have decided to construct forthwith new filters, service reservoirs, and other works of water supply at Sheephouse. The engineer is Mr. James Diggle, of Haywood.

The annual dinner of the Surveyors' Institution will be held on Wednesday, March 18th, at the Whitehall Rooms, Hotel Metropole.

Colonel A. G. Darnford, R.E., one of the Local Government Board inspectors, held an inquiry at the offices of the Tonbridge Urban District Council, on Wednesday week, respecting an application for sanction to borrow £925 for the purchase of premises in the High-street, required for purposes of public improvements.

At a meeting of the Helensburgh Antiquarian Society, held on Saturday evening, Mr. John Bruce, F.S.A.Scot., lectured on the recent discoveries connected with the ancient hill fort at Dunbowie, where for several months past excavations have been carried on under the auspices of the officials of the society.

The portrait of the Bishop of London, painted by Professor Herkomer for the walls of Fulham Palace, will be presented to Dr. Temple at Sion College by the Dean of St. Paul's, in the name of the subscribers, on Tuesday next, at three o'clock. The Duke of Westminster will take the chair.

An explosion of gas occurred in Doncaster parish church on Friday afternoon, with the result that the new vestry now in course of erection at the expense of Lord Grimthorpe, Q.C., and several stained-glass windows were destroyed, the damage being estimated at nearly £3,000. Workmen had been fixing a fresh service-pipe to a new meter, and a man, with the customary caution of his class, took a lighted taper with him to ascertain whether or no there was an escape of gas. His suspicions were fully confirmed.

The public works committee of New South Wales has a scheme in hand for the construction of locks and weirs in the river Darling. The estimated cost of the works is about £130,000.

David Gaillan, of Dandee, a retired joiner, has left between £15,000 and £16,000 to the Dundee Royal Infirmary.

The new Deal-street schools, Waitechapel, E., which have been erected by the London School Board at a total cost of £30,725, were opened on Monday night. The school has been built to accommodate 1,200 children. The site, a comparatively small one, cost £13,000, or at the rate of about £11 for each scholar. The building itself cost £17,537. With a view of doing away with the noise arising from the large amount of traffic passing in front of the school, double windows have been provided, and a new system of ventilation and heating the school has been introduced for the first time in any school in the Metropolis.

A new public library has been opened at Ystrad, Rhondda, built at the sole cost of Mr. Clifford Cory. Native stones, with Chattybrook dressings, were used in the erection of the building, which has a frontage of 80ft. On the ground-floor are a newspaper-room, with stands, 30ft. by 20ft., ladies' reading-room, 16ft. by 16ft., and a class-room, 20ft. by 15ft., for technical instruction purposes. On the first-floor are a magazine room and a billiard-room. The fittings are of oak. The building was erected by Mr. Watkin Williams, contractor, Pontypriid, from the designs of Mr. Arthur O. Evans, architect, Pontypriid.

The statue of Mr. John Bright, which has been executed by Mr. Alfred Gilbert, R.A., was unveiled by the Duke of Devonshire, in the Central Hall at Westminster, on Tuesday afternoon. The statue faces that of Earl Russell, being placed at the north-west corner of the hall.

The foundation-stone has been laid of the first board school for Cleethorpes, near Grimsby. The building, which faces Barcroft-street, will be in three departments, and will accommodate 914 children at an estimated cost of £10,977, including fittings. Messrs. Cross and Bentley are the architects, and Mr. Henry Narrows is the builder.





### THE PASSMORE EDWARDS FREE LIBRARY, LISKEARD.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

THIS building, the gift of Mr. J. Passmore Edwards to the inhabitants of Liskeard, is to be built on a site in one of the principal streets in the town, and will have a very commanding appearance. The front of the building, including entrance to back premises, is 80ft. in length, and it extends back, with caretaker's apartments, 76ft. in the rear. On the ground floor there will be a newspaper and periodical room, 30ft. by 20ft.; lending library, with borrowers' lobby, 30ft. by 20ft.; boys' room, 16ft. by 15ft.; also a kitchen and sitting-room for caretaker. On the first floor there will be a reference library, 30ft. by 20ft.; general reading-room, 30ft. by 20ft.; ladies' room, 16ft. by 12ft., with a spacious landing; a book-store over boys' room will be 16ft. by 15ft.; and two bedrooms for caretaker, over kitchen and sitting-room. All other necessary offices for the library and caretaker are also included in the plans. The front elevation is to have Bath stone dressings and Polyphant facings. All other walls are to be built with local quarry stone with brick dressings. The commodious hall and lobby on the ground floor will be laid in tile, and all internal joinery will be of pitch-pine, varnished. The partitions on ground floor will be glazed, so that the librarian from his counter will have complete supervision over all the ground floor. The building will be well lighted and ventilated, and will be heated throughout with hot water on the most approved principle. This is the second gift of Mr. Passmore Edwards to the town. The Cottage Hospital, which has been already illustrated in this paper, being completed, will be opened by its donor in the early spring, who will also lay the memorial stone of the library. Messrs. John Symons and Son, of Blackwater, Cornwall, are the contractors for these buildings.

### DISINFECTING SEWAGE BY CHLORINE.

MR. JAMES HARGREAVES, F.C.S., of Farnworth, near Widnes, delivered a lecture on Monday evening on "Sewage and Zymotic Poisons," at the Royal Institution, Liverpool. The lecturer, after classifying poisons under the heads "elemental," "organic or quasi-organic," and "organised, self-propagating, or parasitic," remarked that the first two had a definite quantitative poisoning power, while the third might have their poisoning power increased indefinitely by propagation. Sewage supplied the elements for the propagation of poisons of this class, and the walls of the sewers furnished favourable surfaces for their growth and increase. The sanitary engineer had some very knotty problems to solve, of which that of sewer

ventilation was by no means the simplest. Of all the chemical agents proposed for disinfection, the most effective, and at the same time the least injurious, was chlorine. The most usual method of using it had been in the form of chloride of lime or bleaching powder, but in this form it added to the alkalinity of the sewage, which was not desirable, and added to the solid matter. By passing chlorine gas directly into the sewers, the sources of infection were at once reached, and the germs exterminated. The chief difficulty in the application of chlorine was its first cost. At present the most practicable means of obtaining it was in the form of bleaching powder, in which the actual chlorine cost £17 to £20 per ton at lately prevailing prices. If made fully effective by liberation in the form of gas, it would cost 50 per cent. additional for the acid used to liberate it. The system of producing it employed electric current, and was most easily applied where electric lighting was in use, and more especially where a corporation produced its own current. The electric plant was standing for more than half its time, so there was power enough to produce all the chlorine needed for the sewers many times over.—A discussion followed, the merits and demerits of the chlorine system forming the subject of practical observations by a number of gentlemen from various parts of the district, whose interest in matters associated with sanitary and electrical engineering prompted their attendance.—A letter from Mr. H. P. Boulnois (city engineer), who was unable to be present, conveyed his opinion that, though chlorine was one of the best at present known disinfecting agents, its application to sewers on a large scale was involved with difficulty and great expense.—Mr. T. L. Miller, M.I.C.E. (consulting engineer, Liverpool), said that for some years past engineers of electricity supply works had been looking for some means of utilising their spare energy, and Mr. Hargreaves had brought before them a very feasible solution of the problem. He did not think anyone would dispute the value of chlorine as a disinfectant in sewers. Still, it might be interesting to note that, as the result of experiment, it had been found that a solution containing .5gr. of available chlorine per litre, when used in sufficient quantity, practically sterilised the liquid portion of sewage, the solid portion being practically unaffected, and that even a .25gr. solution acted as an excellent deodoriser. Further, when 5 per cent. of a .5 per cent. solution was mixed with sewage, the smell was instantly destroyed, and decomposition arrested for six days. With regard to the cost of production, he had very carefully gone into the figures, and was of opinion that if an electricity supply works could be run, day and night, at full load, the cost per unit delivered, including coal, labour, petty stores, salaries, and management

expenses, would not exceed .381 pence; or allowing 7 per cent. for interest and repayment of capital and sinking fund, .717 pence. As showing the available power at municipal electric light stations, Mr. Miller exhibited a diagram showing the output per hour during a heavily-loaded day in the winter, and a similar day in the summer, and he further stated that during the year 1893 the average power used at Liverpool throughout the day of heaviest load in the winter was at 34 per cent. of that at maximum rate of demand, while on a normal summer day the average demand was but 6.3 per cent. of the highest rate throughout the year, the average load for the year being 12 per cent. of the maximum. Allowing that it was the duty of a municipality to undertake the supply of such necessary adjuncts to town life as water, light, and means of getting rid of the sewage, it was surely of equal importance that with the facilities at their hand they should undertake the manufacture of a disinfecting agent such as chlorine, the use of which had been shown to be so efficient a means of keeping the sewers in a clean and wholesome condition. Mr. G. H. Ball suggested that salt water, after being used in the city swimming-baths, might be utilised in the process; but Mr. Hargreaves pointed out practical obstacles to such a course.

### CALLENDER'S PURE BITUMEN DAMP-COURSE.

PROBABLY no more perplexing problem presents itself to the architect, builder, and house occupier than the prevention of damp rising in walls, and its exclusion in exposed situations. Gas-tar, pitch, or slates embedded in cement crack wherever the slightest change occurs in the level of the first course of work, and their utility is then at once at an end. Damp-proof felts are in many cases futile from various causes. Callender's pure bitumen damp-course is not nearly so well known to architects as it deserves to be, though it has stood the test of many years' crucial experience. It is manufactured of pure natural refined bitumen obtained from the well-known lake in the island of Trinidad, and is absolutely free from tar and pitch. Its pliability and ease of application are its chief merits. It is so elastic that it will yield to any extent without injury, while the tests of its resisting power are in every respect satisfactory. It is made on a foundation of jute canvas of just sufficient texture to keep the material in the form of sheets or strips. No plant is needed for its application, or skilled labour. The length is simply unrolled on the wall, and the lengths joined by the application of a hot iron. It fully meets the requirements of the Building Acts, and is very economical in cost. For vertical work—as in sunk basements and cellars, it is specially suit-



able, and it has been largely used by railway companies and engineers as a watertight covering for bridges and arches. For lining reservoirs, tanks, ponds, and freezing-chambers it is unrivalled. No changes of temperature affect it. Mr. Wolfe Barry used it throughout at the Tower Bridge, and it has been employed with satisfaction at the Barry Docks, the Forth Bridge, Carlisle Station, the Nottingham Borough Lunatic Asylum, Banstead Asylum, Claybury Asylum, Shoreham Infirmary, Blackburn Infirmary, and by the London County Council. More than twenty years' experience of the merits of the material has resulted in the present determination to make it more widely known. Specimens and all further particulars can be obtained of Callender's Damp-Course Company, 222-225, Strand, London, W.C. It can be had in all widths, and has been subjected to the severest tests by Messrs. D. Kirkaldy and Son, as regards pressure; by Dr. Wilson Hake and Professor Dupré, for its capability of resisting moisture; and by Messrs. Bramwell and Harris as regards its freedom from change or deterioration under varying temperatures. Our own careful observation of its behaviour leads us to attach a very high value to its undoubted good qualities. Messrs. John Knowles and Co., 38, King's-road, St. Pancras, have been appointed general agents for London and 12 miles round, and will carry stock at all their depots in the suburbs.

#### BOOKS RECEIVED.

*Standard Practical Plumbing*, Vol. II., by PHILIP JOHN DAVIES, Registered Teacher of Plumbers' Work, Gresham College, London. (London: E. and F. N. Spon.)—Mr. Davies's first volume on practical plumbing has been so favourably received by the plumbing craft, that it is almost superfluous to recommend to our practical readers this second volume, which completes the work. The interval between the first and second volume has been profitably utilised in introducing improvements made in various departments of the subject. The author says he has been able to complete his chemical experiments, and to give an account of ancient water supply, bacteriological discoveries, hydraulic-ram work, &c. Mr. Davies not only gives the student of plumbing, a useful textbook of the trade in its various branches, but a history of what has been done in the past in drainage and water supply. The volume is profusely illustrated with over 2,000 engravings, and is recommended by the examiners of the registration scheme of plumbers as a textbook. The chapters on lead-laying are worth the attention of all plumbers engaged in laying gutters, flats, &c. The elementary principles of the work are thoroughly set forth and illustrated by large diagrams of the modes of laying gutters, working drips, making breaks, flashings, dormers, dormer aprons, welts and beads, flats and seam rolls, hips and ridges, valleys, &c. The instructions are thoroughly practical.

*Drawing in Elementary Schools. Illustrated Syllabus of the Course of Instruction in Drawing under the Department of Science and Art.* (London: Eyre and Spottiswoode, East Harding-street, E.C.)—This publication contains (1) an illustrated syllabus of instruction in drawing for elementary schools; (2) a scheme of instruction in drawing for small schools; and (3) an alternative syllabus of instruction for elementary schools. Diagrams accompany these courses, and illustrate the schedule. Teachers in elementary schools, and others engaged in teaching drawing, will find these courses of value. It is suggested that it is desirable to go beyond the standards in teaching. Thus freehand drawing of bold curves may be introduced in Standards I. and II., which only relate to drawing with rulers, lines, angles, parallels, and right-angle forms. Exercises from memory are also suggested. The alternative syllabus of instruction is framed on different lines to that in use, and is intended to provide an alternative course for such schools as choose to adopt it. This alternative scheme is a development adapted to the needs of elder scholars, and a leading feature of this syllabus is drawing at arm's length. The diagrams illustrating Standard I.—II. are circles and ellipses. They are intended to exercise the child's power of controlling the hand, the motion round and round being repeated until the hand can follow in the same track. The children are instructed to stand before their slates or boards, which are fixed in a nearly upright position. The advanced standards show ovoid forms, decorative objects in straight and curved

lines, freehand, combinations of circles, spirals, brush forms, &c. There is also a scheme of instruction for small schools that will be found useful.

—*American Society of Civil Engineers*, January, 1896.—The *Proceedings* of the above society contains a paper on the "Flow of Water in 48in. Pipes," by Desmond Fitzgerald, M.Am.Soc.C.E. The author describes in detail, and by the aid of photographs made by flash-light, a series of experiments conducted last year on the Rosemary inverted system, a part of the Sudbury aqueduct supplying Boston with water, for the purpose of discovering how much the capacity of the pipes had been diminished by friction due to the incrustation of the interior surface. The photographs very vividly show the tuberculated appearance of the surfaces. The weir and piezometer observations are given in a series of tables. Another interesting paper on "Bank Revetment on the Lower Mississippi," by H. St. L. Coppée, M.Am.Soc.C.E., is also given, with illustrations.—*The Digest of Physical Tests*, Vol. I. No. 1, is a new quarterly published by F. A. RIEHLE, of Philadelphia, being a *résumé* of practical tests made in the laboratories of the world. The papers include one by J. B. Johnson, Professor of Civil Engineering, Washington University, St. Louis, Mo., on "The Strength of Engineering Materials," in which he remarks on the condition necessary for successful experimentation and the want of reliability of results of experiments made by improperly trained persons. It is to guarantee results that this journal has been published, and we wish it success. Mr. A. S. Cooper's paper on "Tests of Cement Mortar, mixed with Various Kinds of Sand," we lately gave a *résumé* of, is given; also papers on Autographic Testing Machines, Cement Testing, Strength of Bridge and Trestle Timbers, &c. As a record of experiments conducted by competent authorities, this digest deserves the support of the profession.—*Timber and Wood-Working Machinery* (London: W. Oliver and Sons, Bunhill-row, E.C.)—This large illustrated number deals with an important section of the wood-shipping world, the trade of Germany, Russia, and Finland, and is in continuation of a series of special numbers which have been given by this journal for some years. To the timber importer and merchant some acquaintance with the ports of shipment and of the shippers must be indispensable. These articles are well illustrated by photographic blocks of Leipsic, Stettin, Danzig, Memel, Riga, St. Petersburg, and other great shipping ports. The statistics and figures given and the lists of the principal shippers must be of interest and value to all interested in the timber trade, especially the excellent portraits of some of the leading shippers of Memel. As a record of industrial progress in the trade, and of the mills and machinery used, we recommend this number to our readers. Mr. J. Stafford Ransome, Assoc. Mem. Inst. C.E., writes a special article on "New Machinery and Improvements," which is copiously illustrated by new and improved machines. Several important novelties in wood-working machinery are selected for illustration and description, which are worth attention by all builders and contractors.

#### CHIPS.

The list of partnerships dissolved in Tuesday's *Gazette* includes the name of the firm of Fryer and Bath, Queen Anne's Mansions, Westminster, and Richmond, architects.

The foundation-stone of the new St. Marylebone public baths and washhouses now in course of erection in Marylebone-road, W., was laid yesterday (Thursday) afternoon. The building is of an official type of Italian Renaissance, and is being carried out from plans by Mr. A. Saxon Snell, F.R.I.B.A. Mr. Charles Wall, of Chelsea, is the contractor.

The city council of Bristol have, after several years' consideration and discussion, decided to proceed with the formation of a new road from the centre of the city at Colston-street to the top of Park-street, Clifton. The net outlay will be £42,125, and the work will be carried out from plans by the city surveyor.

The trustees of the Scottish National Portrait Gallery have just given their final approval to the models prepared by Mr. Burnie Rhind, A.R.S.A., for a statue of Mary Queen of Scots, supported on the right by Bishop Lesley of Ross, and on the left by Maitland of Lethington. The group, when executed in stone, will be placed in the large niche in the east front of the gallery, facing North St. Andrew-street, Edinburgh.

#### OBITUARY.

MR. CHARLES RICHARDSON, M.Inst.C.E., the originator of the scheme of the Severn Tunnel, died at Clifton on Monday, aged 81. The tunnel, costing nearly £2,000,000, is four and a half miles long, two miles and a quarter of which are under the water. The designs were prepared by Mr. Richardson in 1863, but it was not commenced for ten years, and was carried to a successful issue in 1886 under the joint-supervision of Mr. Richardson and Sir John Hawkshaw. Mr. Richardson had been a member of the Institution of Civil Engineers since April, 1875.

The death is announced, at the age of 62, of Mr. HENRY BOURNE, of Penarth, near Cardiff, the clerk of works on Lord Windsor's Penarth estate. Mr. Bourne was a native of Birmingham, where he resided for many years. He was formerly assistant engineer on the Birmingham Canal Navigations, and afterwards resident engineer in the construction of the South Durham and Lancashire Union Railway to Kirby Stephen, Westmoreland. Subsequently, as a public works contractor, he successfully carried out extensive sewerage and road contracts in the city of Birmingham and surrounding towns. Eleven years ago he accepted an engagement under Mr. Robert Forrest, Lord Windsor's agent at Penarth, as clerk of works, and has carried out the Penarth promenade and sea wall, roads, drainage, and other work connected with the estate. His great-grandfather, grandfather, and father were all members of the same profession—viz., canal engineers, and the family have been connected with the Birmingham canals since the year 1790.

MR. GEORGE ROBERTSON, C.E., F.R.S.E., the well-known harbour engineer, who died on Friday at the age of 65, was trained under the late Mr. Rendel. In partnership with Sir A. M. Rendel, he built a large extension of the docks at Leith, which was opened by the Duke of Edinburgh in 1881. Sent by Government to inspect the harbours of India in 1870, he made an exhaustive report. But the exposure on the unhealthy back waters of the Indian coast affected his health, and for some years he had retired from active work.

M. JEAN AUGUSTE BARRE, the celebrated French sculptor and medallist, died in Paris on Friday, at the age of 84 years. He came of a family famous, like the Wyons in England, for the fine engraving of medals, coins, and seals. His father was "graveur général des monnaies" in France from 1842 till his death in 1855, when the office was conferred upon his younger son, Désiré Albert, who died in 1878. Auguste Barre exhibited in 1852 a bust of Louis Napoleon, which was adopted as the official portrait for the new French coinage, and appeared on all the coins till 1870. But M. Barre's greatest achievements were in sculpture. In 1831, at the age of 20, he exhibited at the Salon an allegorical group, representing Liberty Triumphant, and he exhibited at 60 annual Salons. His statues of Achille de Harlay (1843) and of Mathieu Molé (1845) were commissioned by the Government for the Luxembourg, as was also a marble statue of the Duchess of Penthièvre. For the town of Caen he executed in 1847 a bronze statue of Laplace, for the town of Rodez in 1864 a bronze statue of Mgr. Affre, and a bronze statue of Admiral Protet for Shanghai in 1869. M. Barre was extremely successful in portrait busts, and had executed a large series representing royal personages throughout Europe, and many of the leading professors in France.

MR. JOHN A. WILSON, engineer and architect, of Philadelphia, died in that city last week, at the age of 59. Mr. Wilson, when only 20 years old, was a member of the party which surveyed the route for the Honduras Inter-oceanic Railway, serving as topographical engineer to the party. After his return from Central America, he entered the service of the Pennsylvania Railroad, and became chief engineer of the road. In 1875, he was appointed consulting engineer on the construction of the buildings for the Centennial Exposition. Later, he became a member of a well-known firm of architect-engineers, to which has been intrusted much important work in Philadelphia and New York. In Philadelphia, the firm carried out, among many other buildings, the two fine railway-stations—the Broad Street Station and the Reading Terminal. In designing the latter, Mr. Francis H. Kimball, of New York, was associated with the firm.

The Stockton Corporation have decided to proceed with the Haverton Hill-road improvement.



## Building Intelligence.

**THE CHURCH HOUSE.**—The great hall of the Church House, forming the south block of the group of buildings, was formally opened by the Duke of York on Tuesday. It has been built from plans by Sir Arthur W. Blomfield, A.R.A., and is Tudor in style. It is constructed of red brick with Portland stone dressings, the roof being covered with Whitland Abbey slates. The basement is occupied by a luncheon-room, a group of offices of various sizes, and by heating and electric lighting plant. The ground floor is mainly taken up by two rooms, 15ft. in height, intended for the temporary use of the Upper and Lower Houses of Convocation. These two rooms will ultimately be converted by the addition of walls and partitions into sets of offices on each side of a central corridor. The fittings, being thus of a temporary character, are of pitch pine and Kauri pine. From the main entrance the visitor finds two wide staircases, with carved-oak balustrades, leading up to the great hall on the first floor. Above the staircases the ceiling, panelled in oak, should be noted. In the great hall itself the hammer-beam roof, fittings, and floor are all of oak, and a spacious gallery, supported on twelve pillars of iron sheathed in oak, is carried round the north and south sides and west end. At the east end a large organ is to be erected. The hall is 113ft. by 50ft., and is 63ft. in height to the apex of roof, and will accommodate 1,200 or 1,300 persons. The building has been erected by Mr. John Thompson, of Peterborough, at a cost of £44,000, the whole of which has been raised. It was illustrated by plans and perspectives in our issue of May 2, 1890.

**DINMORE.**—The chancel of St. Mary's Church, Hope-under-Dinmore, Herefordshire, which is a modern one, is now being rebuilt from designs by Mr. F. R. Kempson, F.R.I.B.A., of Cardiff and Hereford. A lofty organ chamber, which communicates with both the chancel and the north transept by means of arches, and a new vestry is being built. The work is being carried out in fine grey and brown sandstone. The existing fittings, fine marble monument, and the large painted window will be refixed. The work throughout will be of a somewhat elaborate character, and will probably not be finished until the end of summer.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.**—The annual meeting of this society was held on February 5th at the society's rooms, 18, Church-street, Cardiff, the president, Mr. E. M. Bruce Vaughan, F.R.I.B.A., in the chair. A committee, consisting of the president, and Messrs. E. H. Bruton, C. B. Fowler, J. Coates Carter, J. H. Phillips, and C. Wilson, was then appointed to arrange a programme of prize competitions and sketching classes for assistants and pupils. In the election of officers for the ensuing year, it was unanimously decided that, in order to show their appreciation of the way in which Mr. Vaughan had performed his duties as president, the members would be justified in departing from their usual course by re-electing him for the ensuing year. Mr. J. Coates Carter was re-elected hon. sec. and treasurer, Mr. J. H. Phillips was elected joint sec. with Mr. Carter, Mr. W. H. D. Caple hon. auditor, Mr. C. Wilson associates' sec., and Mr. H. L. Hiley hon. librarian. It was decided to hold the annual dinner on April 8th.

**NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.**—This association held its thirty-sixth half-yearly meeting at the rooms of the Institute of Builders, Bedford-street, London, W.C., on the 29th ult., when representatives were present from London, Liverpool, Manchester, Leeds, Birmingham, Huddersfield, Hull, Bradford, Nottingham, Preston, Bristol, Wolverhampton, Brighton, Derby, Bolton, Plymouth, Northampton, Burslem, Walsall, Leicester, Hanley, Bath, Coventry, Cambridge, Newcastle, Staffs, Isle of Portland, &c. County Alderman John Bowen, J.P., Birmingham, the president, presided. The report for the past half-year was approved and adopted. Mr. C. W. Green, of Liverpool, the hon. treasurer, submitted his audited accounts for the past half-year, showing the financial position of the association to be most satisfactory. The president explained to the

meeting that nothing further had been done in the House of Commons with regard to the Plumbers' Registration Bill since the date of the last meeting, and the matter was still in abeyance; but if the measure should be again introduced, a special meeting of the council would be called if necessary to consider same. Mr. Stanley G. Bird, of London, addressed the members with reference to the form of contract, and referred to the negotiations which had been proceeding for a considerable period between the Royal Institute of British Architects and the Institute of Builders, which, however, had fallen through, owing to their inability to agree as to the form of arbitration clause. Pending a settlement of this question, he advised the members to adhere to the form at present issued by the National Association of Master Builders. Mr. James Bowden, of Burslem, addressed the members respecting the form of indenture for apprentices at present in use in the building trade, which he considered so framed as to insufficiently safeguard the employers from heavy claims for loss or damage resulting through the misfortune or negligence of their apprentices. Mr. Trollope, of London, referred to the unsatisfactory relations at present existing between the London master builders and their workmen. He urged upon the members present the necessity of maintaining their unity in view of the increasing demands of the workmen for higher pay and shorter hours. Mr. T. F. Rider (London), Mr. J. Stevenson Jones (Liverpool), and Mr. Alderman Holdsworth (Bradford) were elected to the positions of president, senior vice, and junior vice-president respectively for the ensuing year. Alderman W. H. Jessop, of Huddersfield, was unanimously elected a member of the council, and Mr. Joseph Randall, of London, was elected on the council in the place of Mr. J. M. Burt, resigned. It was resolved to hold the next meeting in Edinburgh. In the evening the council were entertained at dinner by the Central Association of Master Builders of London, Mr. G. W. Trollope presiding.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The monthly meeting of this society was held at the Sheffield School of Art on Tuesday night, the president, Mr. C. Hadfield, F.R.I.B.A., in the chair. Mr. Thomas Winder delivered a lecture on "Local Half-timbered Buildings," in which he said that the early builders used materials indigenous to the locality in which they lived. Hallamshire was originally one vast forest, and it was natural that timber should be the favourite local building material. During the last three years valuable unrecorded examples of early timber work have disappeared from Sheffield, and the number of these erections is becoming rapidly smaller. He traced the use of timber in early military works. The lecturer was uncertain if framed houses were descendants of the "ground collier's" hut, or sprang from another origin. Numerous examples of local framed work were shown, including the Ponds Laundry, Broom Hall, Carbrook Hall, Brightside Hall, &c. The construction of this class of work was described, and illustrated by drawings. Interesting proofs were brought forward that many of these early houses were without flues or glass. The lecture was followed by a discussion, in which the chairman, Mr. C. Hadfield, Mr. R. W. Fowler, Mr. J. B. Mitchell-Withers, Mr. W. C. Fenton, Mr. C. J. Innocent, Mr. C. M. E. Hadfield, Mr. E. M. Gibbs, Mr. J. C. A. Teather, Mr. Buck, and Mr. H. W. Lockwood took part.

The hearing of a Chesterfield arbitration, in which £400,000 is claimed, is proceeding before Sir G. Bruce as umpire and Sir F. Bramwell and Mr. C. Woodall as referees, at the Surveyors' Institution, Westminster. The parties are the Chesterfield Waterworks and Gaslight Company, Limited, and the Chesterfield Gas and Water Board. The board is about to purchase the business and plant of the company, and the company claim upwards of £400,000 as compensation.

The London County Council considered on Tuesday a report from the General Purposes Committee recommending Mr. R. H. Dawe, town clerk of Hull, to the appointment of clerk to the Council, in succession to Mr. De la Hooke, at a salary of £2,000 per annum. The only remaining candidate was Mr. C. J. Stewart, Senior Official Receiver. After a heated discussion, the appointment of Mr. Stewart was carried by 70 to 54. Mr. Stewart, who is 44 years of age, has been 1½ years in the Civil Service, was trained in an accountant's office, and was called to the Bar in 1893.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 6s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XL, XLI, XLVI, XLIX, LI, LII, LIV, LVIII, LIX, LX, LXI, LXII, LXIII, LXIV, and LXV may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. S. and Co.—E. B. Sturgess.—Roy. Acad.—J. R. T.—G. R. and Co.—F. L.

## "BUILDING NEWS" DESIGNING CLUB.

### FIFTH LIST OF SUBJECTS.

F.—A Village Public House by the highway, on a triangular site, with a small triangular grass plot in front. The front line of building to be set back from apex far enough to give a frontage of 60ft. as the limit for building; the site being bounded on both sides by a road, at an angle of 60 degrees to the frontage. The house to be treated externally in rough-cast plastered work, with pan-tiled roofs and wide eaves. Walls whitewashed. The accommodation to comprise a small private bar, and also a bar parlour of about 20ft. by 18ft., a smoking-room of similar proportions, a billiard room for one full-sized table, and on first floor a good room suitable for club and other meetings, measuring about 30ft. long by 18ft. wide. There must be a couple of good bedrooms for visitors off the same main landing, and four or five bedrooms for the household. A large living-room kitchen to be attached, and at the back a wash- and bake-house, scullery, larder, and pantry. The stable to afford standing for six horses, and a coach-house in proportion. The approach to the stableyard is to be made a feature of in the centre of the facade or thereabouts. The sign of the Red Lion is to be suitably introduced. Scale for elevations, 8ft. to the inch; for plans, 1-16in. to the foot. A view necessary. Sufficient other drawings to illustrate the house, and the section may be shown to same scale as plans. Economy to be remembered.

**DRAWINGS RECEIVED.**—"Overture," "Ivy," "Moor," "Snap-shot," "Leemo," "Invicta," "Once More," "Dunelm," "The Owl," "Kaffir," "Canary," "Mac," "A. B. C.," "Bleu," "Oberon," "Pickwick," "Punt," "Breton," "Moonraker," "Sanitas," "Ghiberti," "Dessinateur," "Fear," "La Cigale," "R in Circle," "Giles," "Demetrius."

## Correspondence.

### CLAY IN THE CANARIES.

To the Editor of the BUILDING NEWS.

SIR,—In your issue of the 10th inst., on p. 80, appears an abstract from a letter of mine to a gentleman who is a correspondent of your journal, which was not written for the purpose of publication, as I believe will be evident to anyone who may happen to read it. Speaking from memory, moreover, my impression is that the extract is wrongly given in more than one respect. If I did



make so great a mistake as to say that the clay used here in building is almost equal to our best mortar, will you have the kindness to allow me to correct so great a mistake?

When properly prepared and used, the clay becomes wonderfully hard, and when protected from rain by rendering the work with sand and lime, it apparently lasts for centuries. But, as will be evident to your readers, it is not at all the same thing as mortar.

The timber referred to is that of the *Pinus Canariensis*, and is known as *Ten*. It is extremely resinous, heavier than water, and most durable. It is now scarce and dear, owing to the destruction of the forests, at one time extensive.—I am, &c., ALFRED BOVILL.

Puerto de la Cruz, Tenerife, Jan. 25.

## Intercommunication.

### QUESTIONS.

[11479].—**Entasis**.—What are the proper methods for obtaining the entasis of a Greek Doric column and of a Greek Ionic column? Are the methods explained in any book?—R. T. M.

### REPLIES.

[11477].—**Momentum**.—The momentum of a weight of 1,800lb. with a drop of 8ft. =  $28,800 \sqrt{2}$  units, or 34,500 units (nearly). Formula to use is—

$$V = 2 \cdot 8 S$$

Where V = velocity  
g = force due to gravity  
S = space (8ft.)

$$\text{Momentum} = \text{velocity} \times \text{mass}$$

$$= 16 \sqrt{2} \times 1,800$$

$$= 28,800 \sqrt{2} \text{ units.} \text{—A. E. G.}$$

## Legal.

### ABOUT HOARDINGS.

A HOARDING in a main and crowded thoroughfare, such as the Strand, for instance, is nowadays of much value. It is, therefore, an important point to consider whether the right to let a hoarding erected by him belongs to the builder, or remains, as it were, in the hands of the building owner. A recent case (*Times*, Feb. 1), in which there was a dispute between two rival advertising companies in regard to the possession of a hoarding, is of much interest and instruction in this regard. It appears that the owner of a house in the Strand, which was being pulled down and rebuilt, let the hoarding to Messrs. Partington, the plaintiffs, by an agreement dated March 22, 1895, at a rent of £8 a month, for advertising purposes. On March 28 the plaintiffs took possession of the hoarding, put up their name, and posted their bills. On the same day the builders let the hoarding to Willing and Co., who accordingly, on the day following, posted their bills over those of the plaintiffs, who now brought this action for an injunction to restrain the defendants from doing this, and for damages. It appeared that the building agreement contained a special proviso that the hoarding should not be let for bill-posting. It was also stated that the plaintiffs had sublet the hoarding at a profit of £10 a month; but it seems that the plaintiffs had not obtained the necessary license under the Advertising Act, 1889, and though defendants had done so, it was not until April 1, which was after they had posted their bills over those of the plaintiffs.

Mr. Justice Kekewich, in this state of things, said that he should decide the case on the point of law alone. As to the plaintiffs, the question was, Could the building owner give them a title? He thought not. The hoarding did not belong to the building owner, but, upon the general law, the building agreement, and the evidence, to the builder. Then came the clause in the agreement, the effect of which was that neither party could let the hoarding for advertising. The result was that the plaintiffs had no title upon which to base their claim. But, then, had the defendants any better right? They had an agreement with the builder which was probably no better than that with the owner. The license obtained by them on April 1 had given them a title; but this was after the damage had been done by their posting over the plaintiffs' bills. In this state of facts the Judge dismissed the action, and left each party to bear his own costs. Clearly it would be well in such matters to settle whether the build-

ing owner or the builder is to be able to let the hoarding at the time the agreement is signed.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

**YORK.—BUILDING.—MATERIALS.**—In the absence of any agreement to the effect, the materials would not become the property of the building owner as soon as they came upon the ground. But if money has been paid the builder on account of them, they may be considered as sold by him to the owner. At all events, he may as well remove such as are not claimed by the owner's trustee in bankruptcy.

**WESTMORELAND.—BUILDING LINE.—BAY WINDOWS.**—These bay windows are so wide that they practically bring out the whole front of the proposed building beyond the line, and in this sense there seems some ground for the contention of the council. Possibly the plans might be modified to meet their views.

### LEGAL INTELLIGENCE.

**LONDON COUNTY COUNCIL v. PRYOR.—BUILDING LINE APPEAL.**—Before Mr. Justice Lawrence and Mr. Justice Collins arguments were heard on Monday on a special case stated by a Metropolitan police magistrate, "The London County Council v. Pryor." The question at issue was whether a certain building in Prince George's-road, Stoke Newington, came within section 74 or section 75 of the Metropolitan Management Act. In the former case, compensation would have to be given for setting it back to the general building line; in the latter, an order for demolition might be made. The magistrate had decided in favour of the respondent, a builder, but their Lordships now reversed his finding, and held that he ought to make an order for demolition. Leave to appeal was granted. For the respondent, the case of "Lord Auckland v. Westminster District Board" was cited, and on it the magistrate had based his decision; while for the appellants, the cases quoted were "Barlow v. Kensington Vestry," "Worley v. Vestry of St. Mary Abbotte," and "Livy v. London County Council."

**THE LONDON COUNTY COUNCIL AND SKY SIGNS.**—**THE QUEEN v. VAUGHAN.**—In the Court of Appeal, on Monday, before Lords Justices Lindley and Kay, arguments were heard for and against a rule nisi calling upon Mr. Vaughan, the magistrate, to show cause why he should not state a case for the opinion of a superior Court, in reference to the question whether a notice board on the roof of the Savoy Hotel was or was not a sky sign. The proceedings were taken by the London County Council against the Savoy Hotel and Restaurant Company to compel the removal of the board on the ground that it was a sky sign, and had been put up without the previous sanction of the council. The magistrate dismissed the summons on the ground that the board did not come within the definition of a sky sign in the Act of 1894, and had refused to state a case. The structure consisted of a series of boards in three sections, the entire length being 118ft., and it was secured by rods bolted to the roof. Upon this boarded structure were the words "Savoy Hotel and Restaurant" in embossed letters, 5ft. high. The district surveyor had approved of the structure, and it was admitted to be safe, and the only question was whether it came within the words of the Act, "A sky sign means any word, letter, model, sign, device, or representation in the nature of an advertisement, announcement, or direction, supported on or attached to any post, pole, standard, framework, or other support, wholly or in part upon or over any building or structure." The magistrate decided that the structure in question was not a sky sign, on the ground that the sky could not be seen through it. The Lords Justices were not prepared to say that the structure must come within the definition. The board was put up to make the letters more conspicuous, and it shut out a great deal more of the sky than the letters upon an open framework would do. Therefore, as it had been put up without the licence of the County Council, they were justified in taking out the summons, and the rule would be made absolute, with costs against the proprietors of the Savoy Hotel. The case would be remitted to the magistrate for him to state a case for the opinion of the superior Court.

**CHARGES AGAINST AN ARCHITECT.**—At Westminster, on Friday, Frederick W. Fryer, architect, of Strathmore, Church-road, Richmond, was charged with obtaining £500, with intent to defraud Mr. Edward Bath, an architect, formerly of Cardiff and Swansea, and now of Queen Anne's Mansions, Westminster. In March an advertisement appeared in a professional paper headed "Good Partnership Offered." It set out that a young architect and surveyor, in good West-end practice, wanted a partner with £600 capital. Mr. Bath answered this advertisement, and got into

communication with the defendant, with the result that, on April 1, an agreement was entered into between the parties, which was afterwards ratified by payments to the defendant of £25 and £475. The charge against the defendant was based on representations which Mr. Bath said influenced him to become a partner. The defendant represented that he had been eight years in business, that he had designed and carried out large works, that the office furniture belonged to him, and he denied some rumours of a damaging nature which Mr. Bath put to him. It had since turned out that the office furniture was obtained on a bill of sale, that the defendant had been tried and convicted at the Old Bailey, once for fraud and once under the Bankruptcy Act, and that Fryer was an undischarged bankrupt. In cross-examination, Mr. Bath said when he made the partnership arrangement the defendant had won a competition under the Surrey County Council for a £4,500 contract. He denied that the firm had made large profits, as shown in a balance-sheet. The further hearing of the case was adjourned after formal evidence of the defendant's bankruptcy.

**CURIOUS ACTION AGAINST A BUILDER.**—In the Queen's Bench Division, before Lord Justice A. L. Smith and a special jury, a singular action was tried on Tuesday, in which a Mrs. Pike sued Mr. Edward Jarvis Cave, a builder and contractor, for £261, the interest due to her under a mortgage deed executed by the defendant. The defence was that the plaintiff had obtained great influence over the defendant, a married man, had had immoral relations with him, and that the mortgage on which the claim was based was executed by the defendant under duress, the plaintiff's solicitor having threatened to expose to his family his relations with her. These allegations were repeated by the defendant in the witness-box, but were denied by the plaintiff and her solicitor. Eventually the jury found for the plaintiff for the amount claimed.

### WATER SUPPLY AND SANITARY MATTERS.

**THE METROPOLITAN WATER SUPPLY.**—At Tuesday's meeting of the London County Council, the water committee submitted with regard to the Welsh scheme of supply an important report prepared by Mr. A. R. Binnie, the engineer to the council. The reasons for an independent source of supply were fully set forth, and it was explained that the total area from which it is proposed to draw 415,000,000 gallons per day has an extent of 312,400 acres. The scheme includes the construction of two reservoirs, that at Llan-gorse 2,800 acres in area, and that on the Yrfon 3,350 acres in area, both larger than any yet constructed in this country, at an altitude which would enable the Metropolis to be supplied by gravitation without the aid of pumps. It is suggested that the first part of the scheme, the Usk and Llangorse section, giving a supply of 182,000,000 gallons a day at a cost of £17,462,750, would be sufficient in the first instance; but that powers should be obtained to insure that the other areas comprised in the scheme should remain available for the supply of the Metropolis. The committee asked for authority to expend not more than £10,000 in relation to the scheme.

**LINSLADE.**—A parish meeting was held at Linslade on Thursday, the 6th inst., to decide which of the schemes of sewerage and water supply should be recommended to the district council—"Complete," or that of Mr. Lawrence, who prepared a scheme after adjudicating upon the competitive plans. By an overwhelming majority, the schemes of "Complete" were adopted. The author of "Complete" scheme is Mr. H. Bertram Nichols, C.E., of Birmingham. The cost of the engineering work is estimated at £6,196.

**THE EAST LONDON WATER SUPPLY.**—The report of the inspectors appointed by the Local Government Board to inquire into the alleged failure of the East London water supply in the summer of last year states that the weather conditions of the season put a maximum strain on the resources of the company, which, by the Act of 1894, was enabled to construct works giving them large additional storage capacity, as well as an additional supply. These works are practically completed, and will prevent the recurrence of a deficiency of water in the districts for, at any rate, some time to come. The inspectors decline to express any opinion as to the contention of the vestries that the real remedy for the defects in the water company's arrangements is to be found in sweeping away the water companies altogether and transferring their undertakings to a public authority. They ascribe the scarcity of water in the East London Company's area last summer to exceptional waste, decrease in the supply owing to the drought, and inadequate means of storage. The inspectors add that there would be distinct advantage in having properly-designed means for storage of water in houses.



## Our Office Table.

THE Corporation Art Gallery at Glasgow is about to be enriched by the gift of ten valuable pictures from the collection of the late Mr. James Reid, of Auchterarder and Hyde Park Locomotive Works, Glasgow, who was at the time of his death Dean of Guild for the city, and also president of the Glasgow Institute of Fine Arts. The paintings are:—"Pastorale Souvenir d'Italie," by Jean Baptiste Camille Corot; "Modern Italy," by J. M. W. Turner, R.A.; "Hampstead Heath," by John Constable, R.A.; "Cattle Piece," by Constant Troyon; "The Sculptor's Studio," by L. Alma Tadema, R.A.; "The Frugal Meal," by Josef Israëls; "The Farmer's Daughter," by W. Q. Orchardson, R.A.; "Downward Rays," by John Linnell, sen.; "The Wane of the Day," by Charles Jacque; and "Windsor Castle," by Patrick Nasmyth. The total sum paid by Mr. Reid for the ten pictures was £22,723. The conditions attachable to the gift are that after taking possession in May the corporation may place the pictures in their present galleries in Sauchiehall-street, but whenever the new art galleries in the West End Park are completed and in fit condition to receive the paintings, they shall be removed to the latter building. They are to be hung together in a prominent position in one of the large rooms, or in a special room set apart for them in the galleries. The gift is made by Mr. Reid's four sons, and has been thankfully accepted by the Glasgow Corporation.

MR. DAVID J. ROSS, the engineer to the City Commissioners of Sewers, has presented a report on the projects of railway and other companies applying to Parliament during the present session for powers in respect of various matters affecting the City. A Bill is promoted by the City and South London Railway Company, asking for an extension of time for the compulsory purchase of lands for the construction of the railway. This undertaking has reference to the proposed demolition of St. Mary Woolnoth, Lombard-street. The present limit for the compulsory purchase of land expires in August next, but the Bill asks for a further extension of two years. The present period for the construction of the railway expires in August, 1898, but the Bill asks for authority to extend this for three years. The London Sea Water Supply Company proposes to supply salt water to the Metropolis. The water will be stored in a reservoir at a high level near Lancing, in Sussex, whence it will flow by gravitation to London. The pipes or conduits will enter the City by way of the Victoria Embankment, and thence beneath New Bridge-street, Farringdon-street, and Farringdon-road, a branch being taken from the pipe in Farringdon-street, carried beneath Long-lane, Beech-street, and Barbican, and continued into Chiswell-street. The company will not be able to break up roads without first obtaining the consent of the local authority, and the same proviso applies in respect of the erection of standpipes and hydrants. Clause 49 empowers the company to supply water to private houses at a charge not exceeding 10s. per 1,000 gallons, and under another clause the company may provide and maintain sea-water baths, and in other ways supply sea water. The East London Waterworks Height of Supply Bill makes it compulsory on the company, on and after January 1st, 1897, to keep the water constantly laid on in the district at such a pressure as to enable it to reach the highest houses within the limits of their supply. At the present time the company is only bound to supply water to any house or building 40ft. above the level of the pavement.

WE have received the Thirteenth Annual Report of the Metropolitan Public Gardens Association—that very useful body which has done so much to open up, brighten, and render pleasant and sweet the dingy spots and recesses of this vast Metropolis. Amongst the principal undertakings which the Association has accomplished during the past year may be mentioned the new recreation grounds of Woolwich Churchyard, about four acres, which was generously laid out at the cost of Mr. J. Passmore Edwards, and opened in May last by the Duchess of Fife. The next in size is the large churchyard of St. Peter's, Walworth, and other gardens have been made adjoining All Hallows, London Wall, at West Ham, North Bow, Canning Town. The

Association have also provided seats to many open spaces, and assisted by grants the acquisition of others. The report is interesting, and is accompanied by a map of the Metropolis, showing the operations of the Association, whose offices are in Lancaster Gate, W.

THE builders of Leeds have often had cause to complain in consequence of the action of the sanitary committee of the corporation in condemning structures which in plan had been approved by the building clauses committee. The latter committee have allowed builders to erect privies, whilst the sanitary committee, after the owners have gone to the expense of making this type of convenience, have in many instances condemned them, and ordered the owner to substitute water-closets. With a view to seeing if some uniform principle could not be laid down which would obviate such trouble and expense in future, a conference was held on Monday at the town hall between representatives of the two corporation committees, under the chairmanship of Mr. Womersley. It was pointed out that practically the only reason why some builders preferred to supply privies rather than water-closets was because they cost less. A strong feeling was expressed in favour of a by-law being passed prohibiting the erection in future of anything but water-closets.

At the Royal Institution, on Friday night, the Hon. John Collier read a paper on "Portrait Painting in its Historical Aspects." The lecturer dealt with the different schools of historical portraiture, and criticised their styles and methods. He remarked that the early painters, as well as a good many of those who came after, suffered by the tyranny of clothes, and were more particular about the arrangement of raiment than they were as to the accuracy of features. The greatest of all schools was the Dutch school, and Rembrandt produced perhaps the finest portrait group in the world when he painted a representation of five merchants seated round a table, with a servant waiting upon them. The perspective of the picture, however, was absolutely insane. If he wanted to have a portrait of a man as he was, he would sooner have a portrait by Holbein than he would have one by any other painter the world had produced, however great. He contrasted the schools of Rembrandt and Velasquez, whom he described as being, all round, the greatest portrait painters that had ever lived. Dealing with the Flemish school as embodied in Vandyck, he remarked that Vandyck exercised an unfortunate influence upon art. On his return to England from Italy his studio became a mere manufactory of superficial portraiture. Early in the 17th century a remarkable school of portrait painters sprang up in England, including Sir Joshua Reynolds and Gainsborough. Their work was, like that of Vandyck, spoiled by its becoming fashionable, and the poor specimens were very poor indeed. This was a brilliant epoch in the history of English portrait painting, and really the last epoch of portrait painting. As to the general tendency of modern portrait painting, much of it was experimental, and to a certain extent that experimental feeling was a praiseworthy one. There should, however, be some limit to it.

It is now some years since Messrs. W. E. Rendle and Co. placed before engineers and architects their "Invincible" system of glazing, which has proved a great success in every way. Since that time the system has been considerably improved, the bar being made both lighter and stronger, permitting squares of glass up to 10ft., and even 12ft., being used. This system has now been fixed on some of the most important roofs in the United Kingdom and abroad, and consists of a metal channel-bar (either copper or zinc) drawn in one piece, on which the squares of glass rest, these being held in position by a cap of similar metal placed over the joint and secured by screw bolts and nuts placed about 12in. apart. This bar, when mounted on a moulded wood core, is very strong, permitting squares of glass about 10ft. long being used, and is even more durable than iron in positions subjected to sulphur fumes and the destructive influence of the atmosphere generally. It is therefore claimed for this system that it is stronger, more durable, and that the glass is less liable to fracture through the unequal contraction and expansion of the materials used, than any other. The bar has a large central channel, down which any water that may find its way under the

cap, passes out on to the square below, and on either side are formed condensation channels, which carry off the condensed moisture in similar manner. The moulded wood cores assist in binding the roof together, and have a light, though at the same time substantial, and pleasing appearance from below. The new price list issued by Messrs. W. E. Rendle and Co. gives numerous illustrations of the important public buildings in which their system has been adopted, one of the latest, as elsewhere mentioned, being the new Tate Gallery.

### MEETINGS FOR THE ENSUING WEEK.

- SATURDAY (TO-MORROW).**—Edinburgh Architectural Association. Visits to Electric Lighting Station, Dewar-place, and to Nos. 11 and 23, Drumshugh-gardens. 2.30 p.m.
- MONDAY.**—Surveyors' Institution. "Conditions of Building Contracts," by A. A. Hudson, A.S.I. 8 p.m.
- Royal Institute of British Architects. "The Domed Churches of Perigord and La Charente," by R. Phénix Spiers, F.S.A. 8 p.m.
- Society of Arts. "The Chemistry of Certain Metals and their Compounds Used in Building," Cantor Lecture No. 1, by Prof. J. M. Thompson. 8 p.m.
- TUESDAY.**—Society of Arts. "Recent Developments in Electrical Traction Apparatus in America," by G. F. Marshall. 8 p.m.
- Institution of Civil Engineers. Discussion on "The Manufacture of Aluminium by Electrolysis." 8 p.m.
- Society of Architects. "Architectural Training," by G. A. T. Middleton. St. James's Hall, Piccadilly. 8 p.m.
- Glasgow Architectural Association. Lecture, by John W. Simpson, A.R.I.B.A., of London. 8 p.m.
- WEDNESDAY.**—Society of Arts. "Report of the Royal Commission on Secondary Education," by H. Macan. 8 p.m.
- FRIDAY.**—Architectural Association. "The Modern Stencil," by Arthur Silver. 7.30 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE FOURTH ORDINARY MEETING of the Society of Architects, for the Session 1895-96, will be held in the Rooms of the Society at St. James's Hall, Piccadilly, W., on TUESDAY, FEBRUARY 18th, at Eight o'clock p.m., when a paper will be read by Mr. G. A. T. MIDDLETON, A.R.I.B.A., entitled "ARCHITECTURAL TRAINING."

ELLIS MARSLAND, Hon. Sec.

## The Society of Architects.

Founded 1884. Incorporated 1893.

### EXAMINATION FOR MEMBERSHIP.

The Examination for Admission to Membership of the Society of Architects comes into operation on NOVEMBER 1st, 1895. The Subjects of the Examination to be held by the Society are as follows:—

- Section I. ARCHITECTURE.**
- Subject (a). *Planning and Design.*—The plan and design of some building, or portion of a building, with details to a larger scale.
- Subject (b). *Architectural History.*—The general principles of the various styles and periods of Architecture; their dates, mouldings, and enrichments.
- Section II. BUILDING CONSTRUCTION AND MATERIALS.**
- Subject (a). *Construction.*—Constructional details in all trades.
- Subject (b). *Materials.*—The properties, methods of working, manufacture, and the application of materials to building works.
- Section III. PRACTICE.**
- Subject (a). *Specifications.*—Preparation of specifications, and the examination of Builders' accounts.
- Subject (b). *Contracts.*—The conditions pertaining to a building contract; the relative positions of architect, client, and contractor; and other questions of ordinary practice.
- Subject (c). *Sanitary Science.*—To include water supply and drainage, ventilation, lighting, and heating of buildings.

**ALTERNATIVE EXAMINATIONS.**

The Council accepts, in lieu of the Society's own Examination, certain Examinations as partly or wholly alternative. Full particulars of these and of the Synopsis of the Examination will be published shortly.

ELLIS MARSLAND, Hon. Sec.  
St. James's Hall, W., December, 1895.

THE York Board of Guardians have adopted plans by Mr. Penty, of that city, for new dining-hall, kitchen and laundry, and vagrants' wards at the workhouse, estimated to cost £8,600.

At a general assembly of the Royal Scottish Academy, on Wednesday, the following were elected Academicians:—Mr. John Lavery, Glasgow; Mr. William Grant Stevenson, Edinburgh; Mr. Hippolyte John Blanc, architect, Edinburgh; Mr. William Leiper, architect, Glasgow; and Mr. John Honeyman, architect, Glasgow. Mr. Lavery was born at Belfast in 1857, and went as a youth to Glasgow, where he devoted himself to painting; he spent some time in Paris under Bouguereau, and returned to Glasgow in 1881. Considerable attention has been attracted at recent exhibitions of the Royal Scottish Academy by his portraits. He was elected an Associate in 1892. Mr. Stevenson is well known as a sculptor.



## CHIPS.

On the triangular open space at St. Augustine's Bridge, Bristol, a tramway waiting-room and office is about to be built from designs by Mr. Yabbicom, the city engineer. The building is estimated to cost £5,000, and has been approved by the city council.

The committee of the new Baptist Tabernacle at Woolwich (Mr. W. H. Woodroffe, A.R.I.B.A., architect) have decided to light the building with Stott-Thorp reflex ventilating lights, and the whole work is to be carried out by James Stott and Co., of 174, Fleet-street.

The Cambrian Railway Company have built a new station at Tonfannay, two miles north of Towyn, on the road to Barmouth, from plans by Mr. George Owen, their engineer. The official inspection by Col. Yorke, of the Board of Trade, took place on Wednesday week.

The urban district council of Buxton have appointed as engineer and surveyor Mr. W. H. Grieves, at present the assistant borough surveyor of Crewe. There were 179 candidates for the appointment, which carries a salary of £200 a year.

The Queen has approved of the appointment of Mr. Thomas Robertson, general manager of the Great Northern Railway of Ireland, to be Chairman of the Irish Board of Works, in the place of Lieut.-General Sir Richard H. Sankey, who retires on the 22nd of March next. Mr. Robertson's appointment is for a period of five years.

A destructive fire occurred on Wednesday night on the premises of Messrs. Higgs and Hill, contractors, Crown Works, Sunnysbank. They extend from Kennington-oval to the South Lambeth-road, covering an area of about four acres. This space is covered with workshops, stables, stacks of timber, and so on. The fire broke out in the carpenters' workshops. Two buildings of one floor, about 80ft. by 40ft., were gutted, a great quantity of timber in the yards was destroyed, and other damage caused. The timber alone which was destroyed was of the value of about £10,000. The firm was insured in several offices, chiefly in the North British and Mercantile. A large number of workpeople will be temporarily thrown out of employment. The cause of the fire has not been ascertained.

At a general assembly of the Members and Associates of the Royal Academy, held at Burlington House on Wednesday night, Mr. Solomon J. Solomon and Mr. Edwin A. Abbey, painters, were elected Associates, and Herr Adolf Menzel, of Berlin, painter, and M. Paul Dubois, of Paris, sculptor, Honorary Foreign Associates. On Thursday, in next week, the 20th inst., a meeting of members of the Academy—in which Associates do not take part—will be held for the purpose of electing a successor to Lord Leighton.

A public library and reading-room, erected by the Tottenham District Council, was opened on Wednesday by Mr. J. Passmore Edwards. The building and site cost £5,280, and another £500 has been expended in fittings. Messrs. Edmeston and Gabriel, of 42, Old Bond-street, E.C., are the architects. At present the library contains 4,800 volumes, 1,000 of which were given by Mr. Passmore Edwards. Space is provided for 15,000 volumes.

Major-General H. D. Crozier, a Local Government Board inspector, held an inquiry at Durham, on Friday, into an application by the city council to borrow £30,000, to carry out certain sewerage works in the town, rendered necessary by the action of the Durham County Council under the Rivers Pollution Act, in compelling the city to take its sewage from the Wear, into which it is drained at present. The town clerk explained that, in a competition for schemes for sewage disposal, that of Messrs. Lomax secured the first premium. This scheme was practically that proposed to be carried out; but a refuse destructor had been added, at an extra cost of £3,000.

At Saturday night's meeting of the Leeds and Yorkshire Architectural Society, a lecture was delivered by Mr. C. E. Mallows, on "Architectural Drawings, for Competition and other Purposes." Mr. Mallows gave much practical advice to students.

The fountain which has been erected opposite St. Peter's Church, Lichfield-street, Wolverhampton, in memory of Mr. Horsman, the munificent donor to the local art gallery, has been completed. It consists of a fountain and three basins, of Portland stone, and has been executed by Messrs. Farmer and Brindley, of Westminster Bridge-road, S.E., at a cost of £650.

The excavations now in progress near the Theseum, at Athens, under the supervision of Herr Dörpfeld, director of the German Archaeological Institute, have resulted in the discovery of a marble bust of the Roman Emperor Antoninus Pius, the beard and hair of which show traces of gold. Herr Dörpfeld hopes to come upon the portico of the Basileion of Stoa, described by Pausanias.

A new railway station will be built at Bolton in the spring, at an estimated cost of £100,000.

Lady Mostyn opened on Tuesday the gallery which has been added to the Royal Cambrian Academy at Plas Mawr, Conway. The architects are Messrs. Arthur Baker, R.C.A., and Hughes.

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Lansdowne House, for the Right. Hon. the Marquis of Lansdowne.

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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2146.

FRIDAY, FEBRUARY 21, 1896.

### ADVISERS, ARBITRATORS, AND TASKMASTERS.

IT may be an instance of "the soul of goodness in things evil" that, at the very time when there is a question of revising the recommendation of the Institute about competitions, more than one competition should turn itself into an object lesson on the faults of the assessorship system. In one quarter we see an unsatisfactory award enforced, and a design of merit thrust aside by an assessor's fiat to make room for one of less desert. In another quarter it seems possible that a similar result may be arrived at by the very opposite road. An architect of high ability was called in to advise the promoters on the comparative merits of the designs submitted, and an earnest effort is now in progress to make his advice of no effect. About the merits of this latter dispute we are not in a position to speak, nor, to all appearance, do they count for much with those who have started it. With them it is simply a question of fellow citizen *versus* outsider; a display, apparently, of that narrow feeling which almost everywhere seeks to keep the outsider outside still.

These two cases illustrate two opposite ways in which the assessor system may fail. Make the assessor an absolute arbitrator, and he is too strong; make him an adviser, and he is too weak. In the one case it is enough for him to repeat, "I have selected this design and it is the best." A multitude of disinterested architects, of a standing in no way inferior to his own, may be convinced that another design is better, but they can do nothing. He is as independent of them as Chaucer's fox, with chanticleer in his mouth, was of the crowd that pursued him. "They yelleden as fendes don in helle;" but he was in a position to reply—

Turn ye again, ye proud churles alle—  
A very pestilence upon you falle;  
Maugre your head, the cock shall here abide,  
I will eat him in faith, and that anon.

Thus it is all up, for that time, with the meritorious and unfortunate competitor. Next time, perhaps, his work is judged of by a different assessor. This one is no arbitrator, but only an adviser—and not quite the sort of adviser whom committees like. He does not find out what design they prefer, and then recommend them to adopt it; he relies on his own ample knowledge, and his lifelong experience. Now, if knowledge and experience always led their possessors to the same conclusions as the lack of experience and knowledge, they would not be worth much; and if an accomplished assessor always decided as an uninstructed body would like him to decide, there would be no use in having an assessor at all. Suppose, then, that he decides differently. He tries, perhaps, to explain his reasons; but who can make artistic reasons clear to people who never learned the very rudiments of art? Probably they like the worst design best; or they think it is all "a mere matter of taste," and that one design is about as good as another. If they were going to dine together, or were even selecting the wine for a public dinner, they would look upon "a matter of taste" as no trifle. But the taste, in that case, would affect their body, and would thus be an important matter to them; while, in the other case, it only relates to that doubtful entity, their mind. This being so, they resolve to settle the competition by considerations which they can all feel the weight

of. Here are so many hundred pounds to be paid to an architect. Shall the money go to someone who will spend it in the town, or shall it be carried away to a distance? This is an appeal that comes home to their business and their bosoms. Here at last they feel themselves on solid ground, and they are strongly tempted to throw up the adviser they have called in, and to act as if they had never even heard his name.

We do not mean to imply that there are not many cases in which local architects deserve to win. There are clever men, and especially clever young men, in provincial towns as well as in London, and every assessor who is worthy of his position will rejoice just as much when he can fairly give them the first place as when he can assign it to competitors who are better known. But the evil is, that committees so often want to favour "the local man," even when he does not deserve favouring. This injustice, indeed, is not confined to the country. In one way, London is almost free from it. There are cliques enough amongst architects; but there is no London *versus* country clique. Nobody in the Metropolis cares in the slightest degree, when he fails to gain a competition himself, whether it is won by another architect there, or 500 miles away. Our friends at a distance cannot always understand this. When, for example, a clever man from the North carried off the first prize in the Admiralty competition, some of the newspapers of their district gave the reins to their fancy, and depicted the consternation with which architects in the South would receive the news. But the consternation was just on a level with that which was caused at London Bridge when the Gloucestershire ploughman threw a spadeful of clay into the spring with which the Thames begins, and so stopped it. He flattered himself that the ships in the Pool were aground, and that he had destroyed at a stroke half the commerce of the world. Conscience would not let him enjoy such a triumph long, and with the feeling that the Cockneys owed him a lifelong debt, he took his spadeful of clay away again. Unfortunately, they neither perceived when he put it on nor when he took it off; and so it is, as to any personal feeling, when a country practitioner wins a London contest. But there is in certain cases a sort of parochialism which takes the place of provincialism, and instead of the "respected fellow-townsmen," we meet with "the respected parishioner." Happily, this does not occur very often. It is a peculiar characteristic of vestry-hall competitions, and is absent from larger and more important ones, and we doubt if it ever attains the force or the malignity which the allied disease manifests in distant places.

Authorities do not inform us whether Sir Anthony Absolute was ever a member of a building committee. But there was one trait in his character with which many of them could sympathise. "No one," he says, "is more easily led than I am—when I have my own way." The problem is to lead them when they do not have it. In some competitions there has been an attempt to solve this problem by a compromise. The assessor is empowered to award the premiums at his own discretion, while the committee reserve to themselves the right of deciding which design shall be executed. There are intelligible reasons, and not dishonourable ones, why this division of power should recommend itself to them in case of an open competition. They do not know who may gain it, and they cannot foresee whether the work can or cannot be safely intrusted to him. There are black sheep in all professions, and chance might bestow one of the very blackest on them as their architect. There are young and inexperienced architects, too, and in this way there might be imposed on them a design by someone who was scarcely competent to get it built.

This, indeed, is less likely than they think; but still it is conceivable, and it is one of the evils against which a prudent committee try to guard. Now on this point we have to remark that no such evils are to be feared in a limited competition. In that the committee begin by selecting the architects who are to compete, and it is their own fault if they select anyone who is not suitable and qualified for the position in every respect. In common fairness there ought to be no further picking and choosing at the end amongst the competitors whom the committee picked and chose at the beginning. That one of them who submits the best design (that is, the best which takes account of all the essential conditions, including cost) should have an absolute right to the appointment; and if he happens to be a stranger, it is a mean and unjust thing to try and oust him in favour of somebody else who has more personal friends amongst the promoters. There is no excuse for this division of power in limited competitions. If the assessor there is to award anything, he should award everything.

In open competitions the case is not quite so clear. Various courses suggest themselves. For instance, the assessor might award the premiums without knowing who was gaining them, and might afterwards decide who should carry out the work when the authors' names had been ascertained. But this would throw a great responsibility on him, and put him in a most invidious situation. If he were too cautious, he might destroy the one chance of some promising student's career. If he were too easy, he might help to make that building a failure, which he had been specially called on to make a success. His position would be far from pleasant even when, for excellent reasons, he declined to give the execution of the work to the holder of the first premium. It is by no means certain that he would not be liable to an action for damages. If a singer, without proving any tangible loss, can recover £100 from the manager who put her name a line or two lower down in the programme than was customary, an architect could surely recover more from the assessor who deprived him of commission on £10,000 or £20,000, or perhaps £100,000. This way of arranging the matter, therefore, is hardly likely to be approved. Yet to leave the appointment of the architect entirely in the committee's hands makes the assessorship almost a mockery. When, some 12 or 15 years ago, more than a thousand hopeful architects signed the Competitions Memorial, the idea in nearly all their minds was that the assessor should determine who was to carry out the work. Nobody would have taken the trouble to promote such a memorial, or even to sign it, if it had been foreseen that the assessor was only to settle the distribution of two or three premiums, perhaps amounting altogether to no more than £50 or £100. It is not for these that architects compete; it is not for them they would compete, even if the first premium were not very often taken away again almost as soon as it is given. It "merges in the commission." What an elegant way of saying that it is a delusion and a snare—a sort of artificial fly with no nourishment in it, which will be pulled out of the fish's mouth as soon as it has served its purpose in hooking him!

The assessor should surely have the power of deciding who is to prepare the working drawings and specification, on the usual terms. The committee would still have a veto on the employment of the selected architect to superintend their building. It is a veto which, if they knew their own interests, they would seldom exercise, and only in extreme cases; but in these cases it might save them from risk and unpleasantness. Yet we can hardly expect them to give their assessor even as much latitude as this, until



assessors in general are chosen with more wisdom. Every architect is not competent to decide about every sort of building. Assessors need classifying, so that they may each be appointed to the cases he is most fit to deal with. When this is done, they will be trusted further. But, both now and then, they might do something to make competition work less onerous for the competitors. The tendency of some of them is to make it harder and harder. "Man," according to the old Greek adage, "is a wolf to man," and the architect in office is too often a wolf to the architect out of it. Committees in olden times gave trouble enough: but this was from ignorance. If they asked for plans to  $\frac{1}{2}$  in. scale, or sometimes to 1 in. scale, it was because they knew no better; they were not trying to give trouble for the sake of trouble. The modern assessor, when he turns taskmaster, and imposes on his brethren burdens grievous to be borne, has not this excuse. He knows what he is about, and is not doing as he would be done to. When he asks for roof plans, and drain plans, and plans of plumbing and heating apparatus, and gaspipes and electric wires, and insists on leaving the air-space in every room cubed up and put before him by every competitor, that he himself may be spared the labour of ascertaining it in two or three of the selected designs, he is knowingly and needlessly making the competition system harder, though it is quite hard enough on its victims as it is. Possibly, either by merit or good luck, its hardness or its easiness does not personally concern him, and he looks down on competitors as unworthy of sympathy. So it happens that, while the old committees only chastised them with whips, the modern assessor often delights to chastise them with scorpions. No labour is too great or too palpably useless for him to impose upon them, and unless it is that his onerous conditions are meant to frighten half of them away, and so to lighten his task in selecting a design, it is hard to imagine what motive can urge him on to his vagaries.

#### LOCAL RESOURCES v. FOREIGN SUBSTITUTES.

WHETHER competition has hindered native talent or checked the development of local resources is a question which has a very direct bearing on architecture and building. That it has done so to an appreciable extent cannot be doubted by any who compare the history of the past with the present. Two or three letters on "What is Successful Architecture" have appeared of late in *Indian Engineering*, written by "M.S.A." and "A.R.I.B.A." They suggest the inquiry as to what influence local resources have had upon architecture. Each writer takes an opposite view of the case: one declares that true architecture has seldom been the product of local material, labour, and talent—that foreigners have been chiefly employed in our great buildings; the other rejoins that the success of a work is the product of the people and resources of the locality. Let us recall a few facts. When foreign styles and imported materials form so large a proportion of our architecture, it appears reasonable that we should make some modification of the generally accepted maxim that the architecture of any country or locality is the product of local materials and labour. Indeed, some authorities have gone so far as to dispute the proposition, and to affirm that the best architecture is the outcome of the highest talent of the age, no matter from what country it may be derived. They refer to the great edifices which have been designed and erected in this country by the employment of artists and craftsmen of other nationalities, and to the few which have been the product of strictly local talent. They point, moreover, to the same fact in the

Byzantine architecture, how in each of these instances foreign ideas and influences were at work, moulding and directing the employment of local materials, introducing departures of style. The dominating influence of Rome in the days of her supremacy we know forced upon the subdued countries and provinces the style of her adoption as she had appropriated Etruscan or Greek ideas, and, in fact, employed Greek artists on many of her buildings. Was not the Doric Order itself introduced from Egypt? and did it not undergo phases in its development from the more massive type (like a stone pier) of the temple of Corinth to that of Delos? though the believers in the post or wooden origin would have to prove the exact contrary—namely, that the earliest example was the slenderest instead of being the most massive. Again, was not the beautiful Ionic capital derived from Asia, and did it not in turn become modified by Greek, and then Roman, artists? In each of these instances, however, the original type underwent changes, and in each locality where it had been transplanted local artists and skilled labour gave it a character of its own. The fact is, no one disputes that the germs of architectural styles have often been derived from other countries, and almost every style may be traced back to some origin or prototype of an earlier civilisation. Notwithstanding this fact, local traditions and artists have mainly influenced their adaptation, and new local styles have sprung from them. In this way, Charlemagne, whose relations with the East were very close, drew to himself and other countries under his rule artists, engineers, and skilled workmen from the East, Spain, and Lombardy; they brought with them methods of building which had already deviated from those of antiquity. As Viollet-le-Duc observes, the the Carolingian revival produced different results from those expected, and the new imported elements soon produced notable results in architecture. Perhaps the best illustration of transplanting an old germ into a new soil is that afforded by the Byzantine style. After Constantine changed the seat of his empire from Rome to Byzantium we see a new style beginning, which culminated in the building of Sta. Sophia. During the transitional period, from about A.D. 300 to 622, the styles of East and West were more or less alike, and the Byzantine must be regarded as the offshoot of the Romanesque transplanted in another soil. These instances rather tend to confirm than deny the proposition from which we started—namely, that true architecture has been the product of local influence and materials. They tend, in fact, to show that a foreign element or style introduced or borrowed never acquires any root till it has been subjected to the modifying agencies of local tradition, conditions, and materials. In no case has a transplanted type been accepted unimpaired and unaltered. In the light, therefore, of history, we may still read the proposition in a modified form, and say that "in all civilised countries good architecture has been the product of local materials, talent, and labour." When, as in the case of Canterbury, Wells, and Peterborough Cathedrals, foreign artists and craftsmen were employed, it was simply because local architecture was in a backward condition, and few local artists or workmen could be obtained. Every architectural historian knows that Canterbury Cathedral was designed by two Frenchmen, Lanfranc and William of Sens, the latter architect, indeed, superintended the rebuilding of the choir after the fire of 1174, as the plan and details are quite French—a proof that at that time no one in this country was equal to the task of carrying out the Pointed style, which had its origin in France some time before. Did not this occurrence redound to the wisdom of the builder? A new style, the Pointed, had appeared in some of

the leading churches in France, and the authorities of Canterbury invited over the only man who could be intrusted with building in the new style. This is what would be done everywhere, and is still done now, without in the least reflecting upon local architects or local workmen. In the case of Lincoln, if not at Wells, foreigners were first engaged. The Gothic was not only imported, for, according to M. E. Corroyer, the Aquitainian cupola gave birth to the intersecting arch which is the main feature of Gothic; anyhow, foreign masons or architects were intrusted with the work of the larger churches in many instances. Still, local traditions were everywhere respected. In the naves of these great churches English traditions were followed, and often, as at Canterbury, an Englishman succeeded in carrying on the work.

But the question goes deeper than history. Modern architecture, and, for that matter, building also, is mainly concerned with the question of local materials and skill, or the development of local resources. A large quantity of material and local labour is at present unremunerative because undeveloped, and this notwithstanding the facilities for transit and inter-communication. These modern agencies have, it would seem, rendered it far less necessary to obtain skill or material from a distance, than was the case centuries ago. Provincial men are now posted up to date. But the facilities have rather checked, than given stimulus to, the trade of certain districts, by enabling the pushing manufacturer of large industrial centres to compete with those in certain localities. The leading architects and builders in London can now compete with those in the provinces. A few hundred miles are no deterrent to compete for buildings in any part of the kingdom, and the London practitioner thinks it as easy to carry out a work at Darlington or Berwick or Exeter, as he would to carry out a design in the Metropolis. The large contractor can afford to tender at the lowest rate with local tradesmen a hundred miles away. We see, also, much of the best provincial talent is drained away to large towns. The skilled workman comes to London or to some other city where he can obtain a market for his skill. All these things have checked the development of local resources. We are far from thinking these conditions have favoured architecture; they have to a great extent hindered it. Like agriculture and other pursuits, the building trade has suffered by this transference of skill from the country to the great cities. Architecture certainly is no better for it; it is rather worse. Some persons will say, "But has not the civilising influences and improvements of great cities been brought to bear on buildings erected in the remote country districts?" "Is it not better that an expert London architect and skilled workmen should be engaged than local talent and tradesmen?" Certainly better, if the native resources are not equal to the requirements. Not otherwise. The local conditions of architecture have always been acknowledged as essential. Although, as we have shown, in the case of large edifices, and where a new style was being introduced, foreign architects and workmen were engaged, the development of our national architecture has chiefly depended on local circumstances. During every period of our national architecture, local materials and workmen were employed. No one can have failed to notice how the particular stone of a locality has been utilised in the buildings, which can only be done by those possessing local knowledge. Every country bears witness, and the style of the architecture is influenced or modified by the kind of material. The granite of Aberdeenshire or Cornwall has unmistakably stamped a severe and rigid character on the styles of those localities, and the stone



districts of Yorkshire, Northamptonshire, and Derbyshire show undoubted traces of the influence of the native material on the architecture. Who will deny that there are peculiarities mainly due to the working of the local stone in the buildings of Yorkshire and Northamptonshire and Somersetshire? In localities where stone is scarce, like Norfolk and Suffolk or Salop, a brick or timber treatment prevails; and no one can mistake the style of such a city as Chester with the prevalent character of the buildings of the same age in Nottinghamshire or Lincolnshire. To take one period—say that of the Elizabethan—we cannot help tracing distinct variations in many of the designs reputed to be by Thorpe, attributable to local influences. What a fearful monotony would have resulted if the designs of any particular age had emanated from one source—local features and details would have been impossible! And is it not wrong now that the architecture of our provincial centres should depend so largely on London skill? The question is one that has been raised by many architects in the provinces, apart from any feeling of jealousy. Whenever a town-hall or a large public building is to be erected a general competition is invited, or the committee, advised by their assessor, invite a few local men and a number of London architects of repute to send in. Of course, as a rule, the London competitors stand a good chance, and it is not always, as some imagine, that the local architects score a victory. The Exeter church competition just decided in favour of a well-known and able architect is in point. Of course, the best design ought to win in every case; but the puzzle is, Who is to find it out? The assessor can make mistakes sometimes. Who is to judge? Give the prize to the ablest design, by all means, whether the author be a Londoner or a local man. It is better to select a plan designed by an expert who knows the best types, than an inferior plan by one who may be a practical architect and knows more of local materials and practice. If it were possible to unite the skill of the one with the local knowledge of the other, so much the better. To decide as to the best plan and the most practical mode of execution is a question the single assessor is often incapable of doing. In such an instance two assessors, one a London and the other a local man, appears to be the only way of securing a just award. Local talent ought to receive recognition; we can hardly quarrel with those who in large provincial towns think it fair that a competition for any public building should be limited to local practitioners. On the other hand, the ratepayers and their representative on the town council desire to obtain the highest talent for their money, and the foreign element is introduced. Many kinds of buildings, like markets, dwellings for artisans, baths, libraries, are well within the reach of the provincial architect. He knows the price of local brick or stone and labour, and is able to apply this knowledge in the design of his details; he is not likely to mistake the capabilities of the most desirable material, while his London rival may specify a stone that is quite unsuited to and very costly in the district. In contracts for buildings in provincial places we often see materials and fittings specified by London architects ill-adapted to the locality. Details and fastenings and decorations suitable for Regent-street, Belgravia, or City buildings are grotesquely out of place in a country residence. Yet we notice these things daily perpetrated in buildings hundreds of miles from London. Foreign substitutes in the way of fittings and decoration are painfully incongruous and inharmonious. If a building is to express the materials and resources of the locality, we must try and make it as natural as possible to educate our local workmen and artists in the use and treatment of

their materials, so that they should not have to submit to the intrusion of elements foreign to their wants, a result attributable entirely to the centralisation of artistic instruction.

## TECHNICAL INSTITUTES.\*

(Concluded from page 236.)

### PHYSICS AND ELECTRICAL DEPARTMENT.

AN unfettered choice in the placing of laboratories for physics and electricity would almost certainly result in the choice of the ground floor, on account of the necessity for freedom from vibration. This is more necessary for electrical than for physics work; but in no case is it essential to successful teaching. At Birmingham both laboratories are on the second floor, four floors up counting from the lower basement, and this is by no means an exception. The department should be so placed in the building as to be as far as possible removed from the main engine-room; but there is no objection to having an experimental dynamo-room near the electrical laboratory, nor is it essential that the tables in the electrical laboratory should have foundations separate from the laboratory floor. The electrical laboratory and lecture-room should be in direct electrical connection with the main dynamo-room. A physics laboratory, if for evening students only, need not be large; but with day-schools it is necessary that it should be large enough to accommodate at least thirty students. It should contain, or have next to it, a small laboratory for optical work, which can be darkened at will, and should be provided with a supply of hot and cold water and steam, and with at least two sinks. The provision of a photometric gallery (where length is a first consideration), under the gallery of the lecture-room or elsewhere, has already been referred to. A well-equipped electrical department should contain an experimental dynamo-room, which need not be larger than 30ft. by 20ft., and should have a firm floor, and one or two workshops for instrument making and electrical house wiring. *Chemical Department.*—This department (or, at least, the laboratory) should always be on the top floor, the free and efficient ventilation of the laboratory being most important. The preparation-room is most conveniently placed behind the lecture-table, with a large fume-closet in the wall between it and the lecture-room, and if the plan admits of its being between the lecture-room and laboratory, so much the better. Failing this, it should be placed at the side of the lecture-room, and as near the lecture-table as possible. For the purpose of supervision, one large laboratory, giving an unobstructed view over the whole of it from any part, is preferable to separate laboratories, although chemists generally ask for a separate advanced laboratory. The laboratory should have, as part of it, or immediately adjacent, three small rooms, one for sulphuretted hydrogen work, provided with a fume-closet along one side, one as a combustion-room, and the third as a dispensary, where the chemicals not commonly used are stored. In building the laboratory, care should be taken to provide passages in the walls and other outlets for the ventilation of the fume closets, to arrange the floor for the drains from the benches (at least a depth of 1ft. being required to give sufficient fall), and for the outside drains to the ground below. It is, therefore, almost necessary to plan the laboratory before building, especially as the ventilation of the fume-closets require special provisions. Each student requires about 3ft. 6in. length of bench, the width of a double bench with students working along each side being 4ft. 9in. to 5ft. There should be one fume-closet to about ten students, when independent of the benches. A balance-room should immediately adjoin the laboratory, or form part of it, fitted with wall-benches, which need not have slate tops. It is usual to provide one balance to about every ten or twelve bench spaces, each balance requiring a bench length of about 4ft. *Photographic Department.*—This department, unless of unusual size, as at Regent-street, is naturally grouped with the Chemistry department, and for this reason its rooms should immediately adjoin the chemistry rooms. Its usual provision is a studio with side and top-lights, which can, if necessary, be used

as a lecture-room, and one or two dark rooms, with facilities for the usual fittings. An exposed flat or landing next to the studio is useful for sun-printing. Sufficient attention is not usually given to ventilating the dark rooms, a provision which must be made without admission of natural light. *Natural Science Department.*—This department is generally a small one, and requires no special provision beyond a well-ventilated and lighted room, which can be fitted as a laboratory, in which one or two sinks are necessary fittings. A room large enough to accommodate twenty would probably be sufficient for the majority of cases. A lecture-room to accommodate about the same number, adjoining the laboratory, and fitted with a sink in the lecture-table, should be provided. It would be convenient to place these rooms near to the Chemistry or Physics department. *Art Department.*—The size and importance of this department, and the subjects it includes, differ very considerably in different institutes. The present day is witnessing a greater extension of the application of art principles to technical industries, and the art departments of our technical institutes are exhibiting less dilettantism, and more of a technical character. Students of metal-work, engineering, and building, especially draughtsmen and designers, house-decorators and plasterers, ought to be found in attendance at art classes, where they may receive instruction in form, colour, and design directly applicable to the industries in which they are engaged. I have already pointed out the advantage which results from a close connection between an art department and certain building trade classes. It is unnecessary to say much on the requirements of an art department beyond pointing out the necessity of a good north light, and the advisability of placing the "life-room" as an end room, where it may be shut off from general entry. It is usual to provide at least three rooms for paper-work, with separate rooms for other subjects. *Women's Department.*—The first necessity in this department is that its rooms should be well grouped together, and shut off from the rest of the building. To have all the rooms on one floor would be most convenient, and there would be no objection to this being an upper floor provided it were approached by a staircase rising from near the main entrance, and not used by men students. In any case, the lady superintendent's room and inquiry office should be placed next the entrance door, and the social-room and refreshment-room (if provided) be near the gymnasium. If two floors are utilised, the administrative-rooms, cloak-rooms, and lavatory, social-rooms and gymnasium should be on the lower floor, with the classrooms above. Although, as mentioned later, a separate refreshment-room for women is not found generally necessary for evening work, yet such a room, or one capable of being used as a dining and tea-room is very necessary with day schools. The laundry should consist of two rooms, one for washing and one for ironing, with a good large window in the partition or wall between the two, in order that both rooms may be under the control of a teacher standing in either. To make the laundry and cookery school large enough for 15 and 30 students respectively would probably be amply sufficient for ordinary evening classes, the former subject not being a popular one; but for day-school work it would be advisable to make the laundry also large enough for 30. The cookery kitchen and ironing-room require a demonstration platform at one end, usually three rows of ten each; but for day work it would be a great advantage to have this accommodation in a separate room, or at least so screened off as to be free from disturbance by classes doing practical work. Such a room, if placed between the laundry and cookery school, would probably suffice for both subjects. It need not be more than 20ft. by 16ft., with a counter for the teacher, a gas-stove for cookery demonstrations, and a small ironing-stove for laundry (unless sufficiently near the main ironing-room), and a sink. The laundry should be in such a position as to be protected from the outpourings of the main chimney. A drying-closet in or near to the laundry would add to its completion. At least three rooms for needlework for fifteen students each should be provided, two of which would be more convenient if divided by roller shutters. A small fitting-room near or next to is found to be very useful, and good accommodation should be made for cupboards. *Music Department.*—The chief point to mention here is the necessity for isolation from other rooms where noise would be objectionable. Our experience at

\* By SIDNEY H. WELLS, Principal of the Battersea Polytechnic. A paper read before the London Architectural Association on Friday, Feb. 7, 1896.



Battersea has shown that even double walls and doors are not proof against the passage of the music of a brass instrument lustily blown, or a stentorian bass voice. Where a great hall is provided, I see no reason why a little alteration in the usual accommodation of artistes' rooms should not give all that is necessary for the music classes. If a hall is not available, then the music rooms would be best placed at the top of the building, as far as possible from lecture or classrooms. *Administrative.*—The position for the chief administrative rooms, as shown in Appendix A, should need no recommendation. The four rooms bracketed should have inner doors from one to the other, and, when used as shown, present the best possible arrangement for convenient working. There would be no great objection to placing the council-room on an upper floor. It usually serves a very useful purpose as a reception-room, and would thus be well placed if near the platform entrance to the great hall. A large inquiry office is unnecessary, and is, indeed, rather wasted space. It is too public for use as an ordinary office, and is chiefly used during times of entering students, for about two to four weeks in all, each term. Ordinary inquiries are best made of the hall-porter, and his small box or office may quite easily contain all the prospectuses and bills which satisfy the usual inquirer. At most places it will be found that temporary arrangements are made, such, for example, as using the largest gymnasium or great hall for the first week or two of booking. *Recreative and Social.*—There should be no hesitation in accepting the position of these rooms; most certainly they should be all on one floor, and that the ground-floor. Separation and elevation would be most detrimental to the free and successful use of these rooms. It is difficult to say what the size of this department should be. *General.*—The question of separate entrances, refreshment and social rooms and inquiry offices for women, of the arrangement of entrances, cloak-rooms, and lavatories, are among the details which may make or mar a plan. I am fully aware that the arrangements of many institutes, including polytechnics, are specified in official schemes, to which architects and committees are wont to pay deferential attention. On this point I can only say that, if architects would win Trafalgars, they may sometimes find it necessary to read official schemes as Nelson read the famous signal. Continued experience in the working of these institutes show that many such arrangements are quite unnecessary, and that their provision only adds to the waste spaces of the building, and to the expenses of maintenance. Among these arrangements are separate entrances and refreshment-rooms for women. All polytechnics have them; very few use them; and many are finding, as at Battersea, that the sexes can mingle in classrooms, refreshment-rooms, or reading-rooms with mutual advantage. Separate entrances are useful for special occasions, but for economy in ordinary working the provision of a single entrance, easily controlled by one attendant, is the ideal requirement. The question of cloak-rooms is also important; unless they are near the entrance, the students cannot be prevented from taking their hats and coats to the class-rooms, a proceeding which, in wet weather, is decidedly unpleasant; yet to provide a cloakroom in the most convenient position for such large numbers as 1,000 to 3,000 may not be possible. If cloak-rooms are placed on each floor, or in each department, great expense is incurred in attendants; but these seem to be necessary. Among the eight polytechnics in London the majority have cloak-rooms near men's and women's entrances, or on each floor. At Birmingham the arrangement of departments, and the provisions of doors at the entrance to each, allow of the inside corridors to be used as cloak-rooms, no attendants being necessary—but only a very successful grouping of rooms would make this arrangement workable. My own experience is in favour of large cloak-rooms near the main entrance, and especially is this important with day-schools. Cloak-rooms would be less sources of trouble than they usually are if fitted with larger windows and glass-panelled doors, so as to be more open to the inspection of the porter on duty at the entrance, or of passers-by. Near the main entrance I would also place a common room for the teaching staff (men and women together) with separate adjoining cloak-rooms and lavatories. Such a room, where all teachers can easily go for the reading of notices, receipt of letters, and for interchange of ideas, does very much to promote co-

## APPENDIX II.

Notes on position and arrangements of rooms. B = basement floor; G = ground-floor; p = power required; f = strong floors required, free from vibration; F = fireplace required.

DEPARTMENT.	ROOMS.	FLOOR.	REMARKS.
Mechanical Engineering.	[Lecture-room Laboratory, p.]	B or G.	
	Drawing-office		On top floor for top light (N. light).
	[Fitting and machine shop, p. Smith's shop, p.]	B or G.	Usually near to, and in same block as engine-room. One shop sufficient for smiths and foundry.
	Foundry, p.		
	Pattern shop, p.	B or G.	Not necessary with carpenters' shop.
	Teacher's room		Next or near to lecture-room.
	Store for tools, &c.		" " workshops.
Building Trades, often grouped with Engineering.	Lecture-rooms 2		
	Drawing-office		Same as above.
	Carpenter's shop, p.		
	Brick-cutting "	B or G.	
	Plumbers' "		Stoves used.
	Masons' "		
	Plasterers' "	any	Plasterers and painters, especially latter, should be near Art Department.
	Painters' "		Not necessary if building trades are grouped with Engineering Department.
	Teacher's room		Next or near to carpenters' shop.
	Store for timber and carpenters' work		
Physics and Electrical.	Lecture-room		
	Physics' laboratory		Capable of division to give small dark room for optical work.
	Electrical " f.		Not near engine-room.
	Dynamo-room, p.	B or G.	
	Wiring-shop		One shop usually sufficient.
	Instrument-making shop, p.		Near lecture-room or laboratories.
Chemical.	Teacher's room		Near laboratories.
	[Lecture-room Preparation-room]		
	Laboratory		
	[Balance-room]	Top floor	With two or three small rooms.
	Store		
	Teacher's room		Near lecture-room or laboratory.
Photographic often grouped with Chemistry).	Studio	Top floor	Also used as lecture-room; top and N. light.
	Dark rooms 2		
Natural Science.	Lecture-room		May conveniently be near Chemistry Department.
	Laboratory		
Art.	Elementary room	Top.	All art rooms to have top and N. light.
	Advanced "		
	Life "		With dressing-rooms.
	Modelling "		With store-room for clay.
	Woodcarving "		
	Metal-working room		
	Teacher's room		Near other rooms; top and N. light.
	Lecture-room		Near other rooms.
Women's Department.	[Washing-room]	B or G	Good light necessary.
	[Ironing "]		With store-room and meat-safe.
	Cookery kitchen	First	Good light necessary.
	Needlework-rooms (3)		Good ventilation necessary.
	Gymnasium	G or first	With wash-basins.
	Dressing-room	First	Near refreshment or reading-room.
	Social room, f.		Near principal entrance to Women's Department.
	Lady Superintendent's room, f.	G	
	Inquiry office	G or first	
	Mistress's cloakroom	G	
	" lavatory	G	
	Students' cloakroom	G	
	" lavatory	G	
	Demonstration-room, cookery		Next cooking kitchen.
	Demonstration-room, laundry		Next ironing-rooms.
Music Department.	Fitting-room, dressmaking		Next needlework rooms.
	Bath-room, gymnasium		Next dressing-room.
	Choral and orchestral rooms (one large and one small)		As isolated as possible from all lecture-rooms, classrooms, or laboratories.
	Pianoforte rooms (3)		Might form part of great hall.
Administrative.	[Inquiry office...]	Ground floor at front of building	Next main entrance.
	Secretary's " f.		With safe.
	Clerk's " f.		One large room or two small.
	Principal's room, f.		
	Lavatory	G	Near principal's room.
	Council-room	G	Any convenient position near offices.
Staff.	[Teacher's common room, f.]	G	Near main entrance.
	Cloakroom (men)	G	
	Lavatory (men)	G	
	Porter's room	G	With store-room and lavatory.
Recreative and Social.	[Gymnasium (men)]	G	Good ventilation necessary.
	Dressing-room 'students'		With wash-basins.
	Dressing-room instructor		
	Refreshment-room	G	Next Kitchen and near Women's Department.
	Social-room, f.		
	Club-room, f.	Ground floor near to main entrance	Small rooms for secretaries. Sometimes in one room.
General.	[Reading-room, f.]		
	[Reference-library]		
	Bath-room Gymnasium	G	Next dressing-room.
	[Engine-room]	G	At back of building where noise will not disturb classes.
	Boiler-room		
	Coal-store		
	Receiving-room	G	Next entrance to which goods come.
	[Men's cloakroom]	G	
	Men's lavatory	G	Near main entrance.
	Kitchen	G	Next refreshment-room, with scullery, store, and coal-cupboards.
	Servants' lavatory (women)		Near kitchen.
	Store cupboards	Each floor	

ordination and good feeling, and to reduce the labour of communicating with the staff. My ideal entrance plan would be one with an outer lobby,

a roomy inner hall to which the general public would have access, containing counters for booking students, and in which class time-tables and



other notices could be placed. The passage from this hall to the building proper should be such as could be easily controlled by one attendant, whose duty it would be to prevent persons other than students or visitors from entering, and who should be provided with a small box or office at which ordinary inquiries could be made. The building beyond this should open into corridors giving immediate access through separate doors to the cloak-rooms and lavatories for men and women, to the staff common-room, and leading to the different departments. If the women's rooms could be grouped next the entrance so as to allow of their office for booking being upon the opposite side of the entrance-hall to the men's, the plan would be still more convenient and ideal. Some such arrangement of large public entrance-hall with inquiry offices, and with small entrance to the building proper, is to be seen at the Regent-street Polytechnic, while the plan of the Holloway Polytechnic, forgetting its two entrances, presents an arrangement nearer to what I mean than any other institute with which I am acquainted. The engines and boilers should be placed in rooms apart from the main building, or at least in such a position that rooms next and above them may be workshops, the classes in which would not be inconvenienced by the noise and heat which machinery must necessarily cause; and lastly, I would mention how surprised I frequently am to find how few buildings have the corridors between the outer wall and classrooms, so that the corridor would break the noise from the street, instead of between the inside wall and the classroom, where the room being next the street receives all its noise. At Battersea we have great difficulty in teaching with open windows, on account of the noise from the main road, and it must be worse with institutes having less frontage than we. Parts of the Yorkshire College at Leeds, and the Birmingham Technical School are the only ones known to me where this arrangement of corridor is adopted. In considering what to include in my paper, it seemed that I could do more good by suggesting than describing, and that you would prefer my assuming the character of adviser to that of critic. My chief difficulty has been to know what you expected or desired, and I was naturally led to the method I have adopted by memories of the kind of questions I am usually asked by architects, and by my desire to supply that information which they are usually wanting, but which is surely so essential to the success of their work as designers of technical institutes. Of the actual fittings of the rooms I have said but little, for in this matter I advocate a close partnership between architect and principal, with the latter as predominant partner. Seeing we spent in this country last year no less than £800,000 in furtherance of technical education, and that the eight London polytechnic institutes alone were attended by no less than 27,000 students, surely the success of our technical institutes, which you, as architects, can influence, will add to these causes which promote the happiness of mankind.

#### THE SOCIETY OF ARCHITECTS.

THE monthly meeting of the Society of Architects was held on Tuesday evening at St. James's Hall, Piccadilly, S.W., the President, Mr. Edwin J. Hamilton, of London and Brighton, in the chair. The following were elected by ballot as members:—Robert Masters Chart, The Limes, Mitcham, Surrey; William Charles Frederick Gillam, 75, Waldegrave-road, Preston Park, Brighton; Joseph Craddock Perkin, 5, Unwin-court, E.C.; and Willie Wrigley, Crossley-terrace, Hebden-bridge.

#### ARCHITECTURAL TRAINING.

A paper on this subject was read by Mr. GEORGE A. T. MIDDLETON, A.R.I.B.A., member. Whatever a man's talents may be, and in whatsoever direction they may lie, it is the universal experience (remarked the author) that they need long, laborious, and careful training to develop them to anything like the utmost of their possibilities. The training of a youth in that which is to be his life-work is, therefore, by no means a thing to be considered lightly. Its importance was recognised by the guilds of olden times, who devised a system of apprenticeship which served its purpose well within the moderate limits which the age demanded. In modern times, however, trade by trade in rapid sequence has found the indenture system of education unsuited to its needs, and has discarded it, sometimes for better, and, it

is to be feared, sometimes for worse. What is it to be with architecture? Is the time-honoured system of pupilage to be retained, or is it to be discarded? or, if discarded, with what is it to be replaced? These are important questions, thrusting themselves rapidly into the foreground for discussion and decision; and possibly the greatest assistance to an eventual right judgment which can be at present offered will be as unbiassed a review as any one man can take of the present system and its results, and of the various substitutes which have been tried or suggested. A change is pending, marked above all else by the rapid reducing of the usual term of pupilage during the last quarter of a century. What is this new development to be, and is it to be for good or evil? Not long since universally, and now very generally, the only training in architecture which a young man could receive would be such as he could "pick up" in the office of his principal. Articled for a term, frequently of five (occasionally even of seven) years, he would commence at the bottom of the ladder, spending—or wasting—a year or more in mixing ink, copying letters, and performing the other duties of an office boy. In some offices, and particularly where a good premium had been paid, and the lad was of some social standing, he would be set instead to making copies of the "Orders," without being told what they were or receiving any instruction about them; what might have been a valuable lesson thus being rendered uninteresting and almost useless save as an exercise in the use of the architect's tools—his drawing instruments. Gradually as the youth, through intercourse with his seniors in the office and observation of their methods of work, became more useful, he was set to making simple, and then more elaborate, tracings, to writing copies of specifications, and even, if he were neat-handed, to inking-in and colouring the pencil designs of others. This, together with occasional visits to works in progress, and some experience in field surveying and in measuring-up buildings which were to undergo alterations, has constituted in the past in most cases, and still constitutes in very many, the sole training given to an articulated pupil in return for a considerable premium and gratuitous services rendered for a number of years. Undoubtedly the equivalent is insufficient; and this being recognised by parents, the result has been of late the reducing of the number of years of servitude; the student goes to another office to widen his experience. Thus baldly put, the whole system seems to be made up of disadvantages; and the picture is by no means overdrawn. Yet it could never have remained in almost universal use had there not been points to recommend it. Possibly in no other way could general routine be so well mastered, or business-like habits so well acquired. Constantly, day by day, the small matters of practice have been brought directly within the student's purview, so that when he commences business for himself he is prepared for the thousand and one small hindrances and difficulties which would hinder, if they did not wreck, the prospects of a more liberally educated man. Then, too, when the principal, or even his leading draughtsman, is a man of parts, the mere fact of constant intercourse with him is necessarily productive of good things. The pupil may, indeed, have no knowledge of "styles" or "orders," and be densely ignorant of architectural archaeology; but he becomes an architect in very truth, basing everything he does upon the principles which he has unconsciously imbibed. The success or failure, therefore, of the apprenticeship system of training depends largely upon the individual principal, even more perhaps than upon the individual student—the latter being a constant factor, and therefore negligible when comparing one system with another. Thus, if the principal himself be a man devoid alike of architectural knowledge and of taste, who carries on an architectural business as he would any retail trade, in all probability his pupils, when they leave, will be men like unto himself, utterly unworthy of their high calling; and between this extreme and the other there are all degrees. Both extremes are rare. In the vast majority of offices the student learns something, and generally a great deal more than he is aware of or will admit, of what will be useful to him in after-life, but by no means all he needs to know. The principal may himself be probably ignorant upon many points, and indifferent to others, and a bad instructor even when his knowledge is profound; but he would be almost sure to say, if questioned, that it was the pupil's own fault if he did not

get on. This brings into view the whole difficulty, the discussable point of the situation. What is this supplementary training to be, and how are the half-educated students in offices scattered all over the land to be reached and influenced? And, first, what efforts have already been made to supply the want? In France there exists, and has existed for generations past, a completely organised architectural school, in l'Ecole des Beaux-Arts. Having quoted from Mr. Ernest Flagg, of New York, a short account of the methods of instruction in vogue, Mr. Middleton continued:—We in England, too, have men of the highest distinction and ability who gave up a considerable portion of their time to the cause of education, and that, as in the case of the Institute examiners, without hope of fee or reward. We, too, have valuable prizes annually competed for, though there is nothing to compare with the Grand Prix de Rome; but we do permit a young man, after (or even without) spending a few months or years in an architect's office, "to erect monstrosities and eyesores to public taste"; and we have no Ecole des Beaux-Arts. The first of these disqualifications we are in a fair way to remedy, this society, at least, being whole-hearted in its endeavour to have the Architects' Education and Registration Bill passed into law, and so put a stop to the present unlimited license to practise what the practitioners are pleased to call "architecture"; but we want no compulsory school like the French. There are, as has been already pointed out, important inherent advantages in the system of training by apprenticeship. These are all well known and widely acknowledged. It would be a distinct mistake, consequently, to abandon the system altogether on account of elements of weakness which are also known and acknowledged, without first attempting to strengthen the weak spots, removing what is faulty and replacing by what is sound. Thus all that is required is supplemental training. To secure this, two things have to be offered to the student—incen- tive, and opportunity for study. For the last fourteen years the principal incentive has been the Associates' Examination of the Royal Institute of British Architects, with its high but not prohibitive standard, it being left for the Tite Prize and the Soane Medallion to provide incentives for architectural study of the very highest class. Shortly, too, there will also be the examination for entrance into this Society, the general scheme of which has recently been announced; and before many years, possibly almost immediately, there will be the Compulsory Examination under the Architects' Education Act—which will compel rather than merely incite to study. As for opportunities for study, we are all well provided for in London, at least. We have, first, the Architectural Association, organised and worked upon as perfect lines as could well be devised to meet the needs of Metropolitan students with but their evenings at their disposal. The two points upon which it is open to criticism are, possibly, that the course is so arranged as to leave the student insufficient time for recreation; and that the system of class teaching necessarily adopted at the low fees charged, is incompatible with individual instruction. Then, but little behind the Association in importance comes King's College, and then (shame to it that it should not be first!) the Architectural School of the Royal Academy, with the classes at University College and at the South Kensington School of Art following in receding importance, but all offering opportunities for study, of which the students in London offices are by no means slow to avail themselves. London, therefore, is well equipped, but how about the provinces? In all the greater, and in some of the smaller cities, societies have been founded more or less upon the pattern of the Architectural Association, and in Liverpool and Glasgow there have recently been established properly organised architectural schools with professors of architecture at their head. In these two great centres—the educational facilities are almost equal to those enjoyed by the London students; but in nearly all the other instances failure has had to be reluctantly admitted in some important direction, if not entirely. Sometimes it is that efficient teachers cannot be found in all the subjects; at other times sufficient students are not forthcoming to enable classes in some essential subject to be held; at others, again, local jealousies step in and mar the entire programme. There is scarcely a local society undertaking educational work but has suffered at



some time from one or other of these difficulties, and even occasionally from all at once. Struggling on, however, they have generally managed to revive when an enthusiastic, popular, and efficient leader has arisen; but in no instance is the basis of establishment secure enough to assure that proper educational facilities in all essentials be continuously offered, except, possibly, in the towns already mentioned and in Edinburgh. Outside of the centres in which the influence of these provincial societies is felt, the educational facilities enjoyed by students are comparatively small. The opportunity for study still exists, and for obtaining guidance in that study; but it is not forced before the students' notice, and in most instances is missed entirely. The principal educating influence in these unfortunately-situated cases is that of the professional press. We in England possess, upon the whole, the best architectural periodicals in the world, catering for all tastes and requirements; and the youthful architectural student is well provided for, so far as is possible by these means. One of the principal papers contains a deservedly popular Designing Club, and another conducts a Students' Column, both of which have been of incalculable benefit to many a provincial man, to say nothing of all that is to be learnt by the inspection, week by week, of all the best contemporary buildings, illustrated by drawings of the highest class—though it may be added, as an aside, that students invariably fail to appreciate the fact that these have been reduced in size for reproduction, and in attempting to copy them as they stand, often acquire a tiny, niggling style themselves. The Press, however, evidently cannot do everything that is needed. If a student is to progress, he must work himself, being directed as to what he shall do, and having his work criticised by a competent instructor. This is possible only by the correspondence system of tuition, which it has been left to private enterprise to organise; and there are now three private tutors in architecture in the United Kingdom who undertake it—viz., Mr. Hodgson of Bradford, Mr. Howgate, and myself. My experience has been that this system of teaching is an eminently satisfactory one, being only surpassed in results by direct personal and individual teaching, and being far superior to class instruction. My own method of procedure—and I believe in all essentials it is followed by my rival tutors also—is that of issuing to a student a series of test-papers, similar to ordinary examination-papers, but so worded as to cover a greater amount of ground, and then very fully criticising and correcting the replies received, sending seriously inaccurate work back to be done afresh, with instructions how to avoid the mistakes which have been made. The papers are issued at weekly, fortnightly, or longer intervals, as the circumstances of the case demand, fortnightly being generally preferred by me as allowing time enough for the necessary reading, and none to spare to permit of weariness creeping in. The courses are generally arranged with a view to certain examinations, but can be varied to any extent to meet individual requirements—a most important feature, entirely absent from oral instruction by lectures or in class. At the commencement of a course of papers full instructions are given as to what books should be consulted, and how and when they are to be read, while students are at liberty to write and have their difficulties removed as they arise—a privilege which the more earnest are by no means slow to avail themselves of, if they live within reach of ordinary postal communication, though of little value in the case of one at present working up-country in South Africa. The great drawback to this system, however, is its costliness. In the long run, a year's correspondence tuition costs no more than does a twelvemonth's attendance at the A.A. studio and classes; but to a young man of small means, whose parents have already paid as heavy a premium as they could possibly afford, under the impression that in return he would be taught his whole business, a fee of seven guineas for a course of twelve test-papers—in other words, for continual guidance in the work of an entire winter—seems severe. Yet we private tutors have no endowment to fall back upon, and must live, while the constant correcting, revising, and criticising is exacting in the extreme, especially as none of it can be delegated with success. The tutor must do everything himself, with only clerical assistance, if he is to know his pupils well enough to get the best out of them, for it is necessary to study each character

separately, restraining here and urging there, if need be with sharp and bitter words, or coaxing and indulging in mild flattery, as the case may be, and all to make the student develop his own powers, and not those of his tutor. With so good a system of training well proved and well understood, there is an obvious need of some organisation such as will bring its advantages before the students in the more isolated provincial offices, contemporaneously with inducements to study at all. This Society already has a class of students, to whom certain slight privileges are accorded; it is offering the necessary inducement to study in the shape of the coming examination for admission. Why not allow the students the further privilege of correspondence tuition for this examination at a moderate fee? It would have to be a correspondence class, with a minimum limit of members, all having the same papers issued to them, with the same instructions, upon the same day; but otherwise each could be dealt with separately. There would be no clashing with existing bodies, for it is an open field, encroached upon by none; and proper study upon the part of those most in need of it, which it is the intention of the Society's examination to promote, would be secured. Finally, the Society itself would benefit both in numbers and prestige. The students' class would be rapidly augmented and form, as is desired, the stepping-stone to membership, and good and needed work would be accomplished.

A short discussion followed, in which Messrs. HENRY LOVEGROVE (who regarded the Architectural Association system of instruction as preferable to pupillage, and thought a youth should, early in his training, join King's College classes, and should then enter another office as improver), SILVANUS TREVAIL, of TURO, ELLIS MARSLAND (who strongly advocated the retention of the pupillage system), WILLIAM ALLPORT, and the President took part, and a hearty vote of thanks was accorded to Mr. Middleton for his suggestive paper.

#### NOTES ON DOMESTIC DRAINAGE. - III.

##### VELOCITY AND FLOW OF SEWAGE.

THE velocity and flow of sewage is, for all practical purposes, similar to that of water flowing under the same conditions. As drain pipes of circular section are almost universally used, it will be sufficient to consider the theory of the flow of water or sewage through circular pipes only.

When referring to the velocity or flow of sewage, it must be understood that the *mean* velocity of the fluid is always implied, as the flowing particles have a velocity varying at different points of the same cross section. This varying velocity is due to the friction of the fluid against the sides of the pipe or channel. The *actual* velocity of the flowing liquid is least at the points of contact with the pipe and greatest at the centre of the flow. The *mean* velocity of any liquid stream is found by dividing the volume of discharge by the area of the cross section of the stream, and is usually expressed in feet per second or feet per minute.

It will be readily seen that the velocity of any given depth of flow will vary *directly* as the inclination or gradient of the pipe, so that the greater the inclination the greater will be the velocity of the flow.

It should also be noted that, in consequence of the friction of the fluid particles against the sides of the pipe, the velocity of the flowing liquid through a pipe laid at any specific gradient varies according to the depth of flow on the invert of the pipe. For instance, in a pipe 6in. diameter it will be found that the velocity of a stream having a depth of 1in. on the invert is less than that of a stream having a depth of 2in. in the invert. This is accounted for by the fact that the frictional surface of the pipe (or, as it is usually called, the wetted perimeter of the pipe) bears a larger ratio to the sectional area of the stream when its depth is only 1in. on the invert than when the depth of the flow is 2in. This relationship between the wetted perimeter of a stream to its sectional area forms the basis of what is known as the "hydraulic mean depth" (usually written H.M.D.) of a stream. The hydraulic mean depth is found by dividing the sectional area of the stream by its wetted perimeter.

$$\text{H.M.D.} = \frac{\text{sectional area of flow}}{\text{wetted perimeter of flow}}$$

In order to find the velocity of the flow of liquids through a circular pipe for any given gradient, numerous formulae have been compiled from the results of various experiments. Amongst the best known may be mentioned those of Kutter, D'Arcy, Prony, Neville, Weisbach, Hawksley, and Eytelwein. Some of these are of a very complicated character, necessitating a long series of calculations. That of Weisbach, which is generally recognised as giving the most accurate results of all the formulae mentioned, includes a distinct coefficient for friction for every change of velocity.

For present purposes, Eytelwein's formula has been selected as the most suitable, on account of its well-known character and simplicity of application—viz.:

$$V = 55 \sqrt{H \times 2 F}$$

Where  $V$  = velocity in feet per minute.  
 $H$  = hydraulic mean depth in feet.  
 $F$  = fall in feet per mile.

The drains should be arranged with such gradients that any solid substances usually found in connection with domestic sewage, such as sand, pebbles, paper, faecal deposits, &c., may be carried through them by means of the velocity or power of the flow of the liquids accompanying them.

From the results of various experiments carried out in ordinary well-constructed drains, it has been found that water flowing with a velocity of 120ft. per minute will overcome the resistance offered by coarse ballast or rounded pebbles, and remove them from the drain. When flowing with a velocity of 180ft. per minute, the liquid will remove small stones, faecal matter, paper, or other substances of a like nature. The following table shows the velocity of the flow of water required to remove different substances:—

TABLE SHOWING THE VELOCITIES NECESSARY TO REMOVE DIFFERENT SUBSTANCES FROM PIPE DRAINS.

Description.	Velocity of Flow of Water.
Mud, liquid earth, &c.	15ft. per minute
Clay	30ft. " "
River sand, grit, or small gravel	60ft. " "
Coarse ballast	120ft. " "
Sea shingle about 1in. diam.	130ft. " "
Large shingle	180ft. " "
Angular flints, the size of a hen's egg	200ft. " "
Broken stones	240ft. " "

From an examination of the foregoing table it may be assumed that a velocity of flow which will remove large shingle will be quite sufficient to remove faecal deposits and other solids that may require to be dealt with in an ordinary drain. Accordingly, all drains should, as far as possible, be laid with a fall sufficient to insure a velocity of 180ft. per minute when the normal quantity of sewage is passing.

For general purposes, the normal quantity of sewage ordinarily passing through domestic drains is taken to be equivalent to a stream of sewage having a depth of one-quarter the diameter of the pipe through which it is flowing.

In order that drains may be self-cleansing under these circumstances, it is necessary that a stream of sewage having a depth of one-fourth the diameter of the drain must flow with a velocity of 180ft. per minute, so as to remove the solids with which it is usually associated. The minimum gradients that can be given for self-cleansing drains are as follows:—

TABLE OF GRADIENTS NECESSARY TO PROVIDE SELF-CLEANSING DRAINS WHEN THE DEPTH OF THE FLOW OF SEWAGE IS QUARTER THE DIAMETER OF THE PIPE THROUGH WHICH IT IS PASSING.

Diameter of Drain.	Gradient of Drain.
4 inches	1 in 40
6 " "	1 in 70
9 " "	1 in 100

As an aid to memory, the so-called decimal rule for self-cleansing gradients of drains is easily remembered, and well adapted for ordinary use—viz., multiply the diameter of the pipe by 10, and the result will determine the gradient. Thus:—

Diameter of Drain.	Gradient of Drain.
4 inches	1 in 40
6 " "	1 in 60
9 " "	1 in 90

On comparison with the table previously given, it is seen that this rule will afford good self-cleansing gradients to the drains.



TABLE OF VELOCITY AND DISCHARGE OF SEWAGE FROM CIRCULAR DRAIN-PIPES FOR VARIOUS GRADIENTS AND DEPTHS OF FLOW.

Diameter of drain-pipe.	Depth of flow on invert of pipe.	Area of flow.	Hydraulic mean depth.		Fall, 1 in 40.		Fall, 1 in 50.		Fall, 1 in 60.		Fall, 1 in 70.		Fall, 1 in 80.		Fall, 1 in 90.		Fall, 1 in 100.		Fall, 1 in 110.	
			ft.	ft.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.	Velocity per Minute.	Discharge per Minute.
Four inches	1 in. or $\frac{1}{4}$ diameter of pipe	0.17	0.049	197	21	177	19	161	17	—	—	—	—	—	—	—	—	—	—	—
	2 in. or $\frac{1}{2}$ " "	0.44	0.083	257	71	230	63	210	58	—	—	—	—	—	—	—	—	—	—	—
	3 in. or $\frac{3}{4}$ " "	0.78	0.101	284	138	254	124	232	114	—	—	—	—	—	—	—	—	—	—	—
	3 in. or $\frac{3}{4}$ " "	0.81	0.100	282	143	252	128	230	117	—	—	—	—	—	—	—	—	—	—	—
	3 in. or $\frac{3}{4}$ " "	0.84	0.098	279	146	250	131	228	120	—	—	—	—	—	—	—	—	—	—	—
	4 in. or flowing full	0.88	0.093	257	142	230	126	210	116	—	—	—	—	—	—	—	—	—	—	—
Six inches	1 in. or $\frac{1}{4}$ diameter of pipe	0.88	0.073	—	—	—	—	197	47	182	43	170	40	—	—	—	—	—	—	—
	3 in. or $\frac{3}{4}$ " "	0.68	0.125	—	—	—	—	258	158	238	146	223	137	—	—	—	—	—	—	—
	5 in. or $\frac{5}{8}$ " "	0.75	0.155	—	—	—	—	287	314	265	290	249	272	—	—	—	—	—	—	—
	5 in. or $\frac{5}{8}$ " "	0.82	0.151	—	—	—	—	283	322	262	298	245	279	—	—	—	—	—	—	—
	5 in. or $\frac{5}{8}$ " "	0.88	0.147	—	—	—	—	279	328	258	308	242	274	—	—	—	—	—	—	—
	6 in. or flowing full	0.96	0.125	—	—	—	—	258	316	238	292	223	274	—	—	—	—	—	—	—
Nine inches	2 in. or $\frac{1}{4}$ diameter of pipe	0.86	0.109	—	—	—	—	—	—	—	—	—	—	196	105	186	100	178	96	—
	4 in. or $\frac{1}{2}$ " "	0.91	0.187	—	—	—	—	—	—	—	—	—	—	257	355	244	337	233	322	—
	7 in. or $\frac{3}{4}$ " "	0.94	0.228	—	—	—	—	—	—	—	—	—	—	284	699	270	665	257	633	—
	7 in. or $\frac{3}{4}$ " "	0.91	0.225	—	—	—	—	—	—	—	—	—	—	282	723	268	687	255	653	—
	8 in. or $\frac{11}{16}$ " "	0.94	0.221	—	—	—	—	—	—	—	—	—	—	280	742	266	705	253	670	—
	9 in. or flowing full	0.92	0.187	—	—	—	—	—	—	—	—	—	—	257	710	244	674	233	644	—

## SIZE AND DISCHARGE OF DRAINS.

Where insufficient care is exercised in the determination of the sizes of drains required for any particular purpose, there is a tendency to make them much larger than is absolutely necessary for the work they may be called upon to perform. This is a great mistake, both on sanitary and economic grounds. The efficiency of a drain is not increased by its being larger than absolutely required; on the contrary, it is greatly impaired. For example, the normal quantity of sewage passing through a 4 in. drain may be quite sufficient to allow of its being self-cleansing, whereas the same quantity of sewage passing through a 6 in. drain laid at the same gradient would probably have insufficient depth on the invert to secure the necessary self-cleansing velocity. The larger drain would, therefore, remain in a more or less foul condition, whilst the smaller drain, in the same situation, would be comparatively clean. In addition to this, the first cost of the smaller and more efficient drain would be much less.

The gradients having been determined according to the fall available, together with the maximum volume of sewage required to be taken by each drain, the necessary sizes of the drains may be calculated by the formula—

$$D = V \times A.$$

Where D = discharge in cubic feet per minute.  
V = velocity in feet per minute.  
A = sectional area of flow in feet<sup>2</sup>; or  
Discharge in gallons per minute =  $6.25 \times V \times A$ .

For the sake of convenience and ready reference, the above table has been prepared, showing the velocity and discharge of drains with various gradients and for different depths of flow. These have been calculated from the formulae already given.

By a careful examination of the foregoing table several important facts relating to the velocity and discharge of liquids through circular pipes will be observed, amongst which may be mentioned the following, viz.:—

1. The H.M.D. of a circular pipe flowing full is exactly the same as when flowing half-full—i.e., one-fourth the diameter of the pipe; consequently the mean velocity of the flow in both cases will be found to be the same.

2. The H.M.D. for liquids flowing through a circular pipe is *greatest* when the depth of the flow is approximately *five-sixths* of the diameter of the pipe, and it is at this point that the *maximum mean velocity* of flow is obtained.

3. The *maximum* discharge from a circular pipe is obtained when the depth of the flow is about *eleven-twelfths* of the diameter of the pipe, and not when flowing full, as might be supposed. This loss of discharge when a pipe is flowing full is due to the increased friction offered by the wetted perimeter of the pipe, as compared with the sectional area of the flow.

4. The volume of discharge of a circular pipe flowing full is exactly double that when flowing half-full.

Taking into consideration the facts that the maximum velocity of flow is obtained when the depth of flow is 5-6ths the diameter of the pipe, and that the maximum discharge is obtained when the depth of flow is 11-12ths the diameter of the pipe, it is desirable that the drains should be of such a size as to discharge the previously

ascertained maximum volume of sewage or storm-water per minute when the depth of the flow is  $\frac{5}{6}$ ths the diameter of the pipe. This, being the mean proportion between 5-6ths and 11-12ths, will permit of a slight increase in the volume of discharge without the pipe flowing full, whilst at the same time any slight decrease in the volume of discharge will increase the velocity of the flow, and so increase the scour and self-cleansing action of the sewage passing through the pipes.

No drain should, however, be less than 4 in. in diameter. In all cases of ordinary domestic drainage—even of a large institution—where the drains are laid to self-cleansing falls, it will be found that a 4 in. drain is large enough for the branches, and also for most of the collecting drains of the foul and storm-water sections, with, perhaps, a 6 in. or 9 in. main drain to the outfall.

In some districts, the by-laws of the local sanitary authority insist upon all the soil drains being not less than 6 in. diameter. Of course, under such circumstances the evils entailed by this regulation cannot be avoided.

## SAINT-FRONT OF PERIGUEUX, AND THE DOMED CHURCHES OF PERIGORD AND LA CHARENTE.

A LECTURE on this subject was given before the Royal Institute of British Architects on Monday evening by Mr. R. Phené Spiers, F.S.A., F.R.I.B.A. The President, Mr. F. C. Penrose, F.R.S., occupied the chair. The paper was illustrated by numerous water-colour drawings and pen and pencil sketches, detail drawings, plans and conjectural restorations, the work of the lecturer, and also by many photographs of the interiors of the principal churches described. In his introductory remarks to a lecture extending over nearly two hours, Mr. Spiers explained, by the aid of key maps, that the domed churches to be described and compared lay in a compact group in the south-west of France, north of the river Dordogne. In the course of some investigations into the development and spread of Byzantine architecture, the lecturer visited the district of La Charente three or four years since, and returned to it last summer. The prevalent statements as to Saint-Front of Périgueux to be found in guide-books, and even in the works of the late Viollet-le-Duc and other architectural writers, were all based on the quarto monograph by M. Félix de Verneilh on "Saint-Front-de-Périgueux," which was published so far back as 1851, and was still the only standard work on the subject of Byzantine architecture in France. M. De Verneilh was not an architect by profession, and therefore failed to grasp many of the points of construction and the meaning and history of details. The principal points sought by M. Verneilh to be proved in this work were—firstly, that the five-domed church of Saint-Front was copied from the church of St. Mark's at Venice; secondly, that it was founded about 984 and dedicated in 1047, and was the prototype of all the domed churches in Aquitaine; and thirdly, that, being copied from St. Mark's of Venice, which was inspired by St. Sophia at Constantinople, the French domes had a Byzantine origin. It was now known that St. Mark's, Venice, was inspired, not by the Church of St. Sophia, but by the Church of the Holy Apostles at Constantinople, described by Procopius, and pulled down

in 1460 to make way for the Mosque of Mohammed II. The researches of the last few years had, moreover, proved that the five-domed church of St. Mark's was not commenced till 1063, under Constantine, so that a later date would have to be found for the erection of Saint-Front, for the plan and general design were alike. The records of the period, however, distinctly point to a church of some kind having been founded towards the close of the 10th century and dedicated in 1047, and this directed the lecturer's attention to the remains of an older church of Basilican type, hitherto ascribed to Chronopius II., Bishop of Périgueux 503–530, but which Mr. Spiers contended could not be anterior to the 11th century. This Latin church was immediately west of the existing five-domed edifice. After describing the five-domed church and the old or Latin church, the lecturer proceeded to examine in detail the features of this older church, of which portions of the nave, the aisle walls complete, the west front, and the narthex still remain, comparing it with the older existing work of the Latin church at St. Mark's, Venice. The west front is interned as the inner wall of a house which faces St. Front, and which has only lately been purchased by the cathedral authorities, and Mr. Spiers was fortunate in being allowed to sketch and measure the details of this long-buried elevation. The piers of the Latin nave, now imbedded in the substructure of the tower, are compound in plan (that is to say, they have attached pilasters or responds on either side), which form was not adopted in France before the 11th century; the aisles were vaulted with a series of barrel vaults placed at right angles to the nave. The earliest dated example known of such a feature is found in the narthex at Tournus (1009 A.D.), near Cluny; from the East of France it crossed to Limoges, where similar vaults were built in 1028, and thence probably descended to Périgueux about 1030.

The west front and porch, now built into the house, are both constructed in ashlar masonry with figure sculpture and other decoration, which would be somewhat in advance of its time even if completed in 1047. The lecturer then described in detail the five-domed church, the construction of which was of a much more advanced character, particularly that of the arched vaults and pendentives, than other 11th-century work in France; whilst the sculptural decoration of the advanced Romanesque type, quite devoid of any Byzantine influence such as is found elsewhere, partook more of the style of middle 12th-century work. Mr. Spiers then referred to a second record, which stated that Saint-Front was burnt down in 1120 in a great and sudden conflagration. This, Mr. Spiers maintained, could not refer to the five-domed church, which is entirely built in stone and without any timber in its construction, whereas it is known that the nave of the basilican church had a timber roof. The last paragraph of the record also says: "At that time the monastery was covered with timber roofs," which, in the lecturer's opinion, showed clearly that the chronicler desired to show a distinction between the earlier church and the existing one, which is built entirely of stone. Having thus sought to prove that the five-domed church of Saint-Front was not built before the 12th century, Mr. Spiers found another task imposed on him—viz., that of showing that domed churches were built in France early in the 11th century,



and that their structure differed entirely from that employed in Eastern domes, the arches being pointed, the pendentives having a double curvature and being built with horizontal courses, and the domes being ovoid in section. The peculiar construction of the pendentives, which were set out on the intrados of the arch instead of on the extrados as in the East of Europe, was explained by several diagrams, and Mr. Spiers claimed that such a method of building was not known in Byzantine domes. The churches of St. Astier (1013), St. Stephen of Périgueux (1013-1047), St. Germain des Prés, Loiret; St. Martin, Angers; Cahors (1119), Brantôme, Solignac (1143), Souillac, Fontevault, and Angoulême\* (c. 1120), and other churches in the Charente were then passed in review, and the complete absence of any Byzantine sculpture, especially in the earlier examples, suggested that they were in no way influenced by Eastern models. It was, in fact, the negative quality in Saint-Front, the entire absence of any Byzantine feeling in it, which first led to Mr. Spiers's doubts about the date given for the five-domed church. The results of his inquiry led him to the belief that, so far from being the first domed church, Saint-Front was the last of any importance built in the Charente, and that the term Byzantine, as applied to the domed churches in France, is misplaced. The French masons of the South of France have already the credit of having perfected a type of church with barrel-vaults in stone covered with stone or tiled roofs. To them also is due, Mr. Spiers contended, an alternative method of roofing their naves with a series of domes, or of the employment of barrel-vaults for the nave and domes for the crossing, the domes being constructed, in all cases, and including Saint-Front, in a manner peculiar to themselves and subject to no foreign influence. In conclusion, Mr. Spiers criticised the extensive "restoration" carried out a few years since under the late M. Abadie, who rebuilt the eastern apse on so great a scale as to dwarf the effect of the building, and added bristling pinnacles to the apse towers and crests to the cupolas, destroying the repose and dignity of the edifice.

The President, in inviting discussion on the paper, said that he saw in the room several who, like himself, had the privilege of visiting the churches of La Charente one-and-twenty years ago, under the guidance of the late Edmund Sharpe. He called on Mr. J. Salmon Quilter, who, in proposing a vote of thanks to Mr. Spiers, said he could not agree with all the deductions made in his paper; he was sorry he had not referred to Mr. Sharpe's conclusions in his great work on "The Churches of La Charente." Mr. H. L. Florence, in seconding the motion, said Mr. Spiers's lecture suggested that it was not safe to take for granted all one read, even in the works of those looked upon as undoubted authorities, who were sometimes misled by imperfect data, and dependence on unfounded tradition into drawing erroneous conclusions. Mr. J. Tavenor Perry said there need now be no further controversy as to the precise period when St. Front was erected; the date of Périgueux was fixed, as it had been rebuilt by Abadie. The President, in putting the vote of thanks, remarked that the lecturer seemed to him to have established his point—that St. Front was later than the other domed churches of the district, thus confuting the theories of the late Viollet-le-Duc. Mr. Spiers replied, remarking that he by no means overlooked Mr. Sharpe's monumental work, although he differed from the conclusions therein arrived at. The better knowledge now possessed, owing to the measurements of Mr. Garrett and others, and the opening out of the old front of the Latin church, enabled him to say with confidence that St. Front was later and not earlier than St. Astier or St. Etienne de Périgueux.

## "BUILDING NEWS" DESIGNING CLUB.

### A SMALL TOWN CHURCH.

A PLACE of worship should at once bespeak itself, and display a dignified importance, no matter how plain its detail and simple its construction necessarily may be. For a workmen's

\* The west front of Angoulême Cathedral, since un happily restored and refaced by the late M. Abadie, was shown by a spirited sketch by the late F. C. Deshon in the BUILDING NEWS for Sept. 17, 1875, and again by a double-page elevation and a plan by the late R. W. Johnson, of Newcastle, in our issue of June 20, 1876. An elevation of this façade, by the late Dr. G. G. Zerffi, appeared in our number for June 5, 1874.

neighbourhood the needs of economy are, of course, as a rule, of the first consideration, and, therefore, those who entered on this competition without rigidly observing this condition obviously failed to realise our intentions. Very few contributors, indeed, deserve the full measure of praise, but some did endeavour to work out the problem with thoroughness and due regard to the requirements set forth for this by no means easy subject. "Mysteriarch" is distinctly the first in merit, "Owl" ranks second, and "Cycle" comes third. The following were the instructions issued to competitors:—A Small Town Church in a workmen's neighbourhood, to be built on a corner site, with the angle towards the S.E., the total length being 140ft., and the width 52ft.; the east and south walls of the church to follow the frontage lines, which are square. Light can be had above the houses on the west and north sides. The sills of the west windows (which are optional) may be 25ft. from the floor, and those to the windows on the north side may not be less than 20ft. from the ground. The relative proportions of the nave to chancel are left to the designers, who will do well to refer to our reviews of previous church designs submitted in connection with our Designing Club, published in the BUILDING NEWS for Feb. 22, 1889, Feb. 20, 1891, April 28, 1893, and Dec. 7, 1894. This reference is not to copy the plans therein described, but to gather in a general way the leading points necessary to observe in planning churches for worship, and adapted to the ritual of the English Church as now in use. The sanctuary or altar-platform is to be 3ft. 6in. above the nave floor; but the position of the seven steps is left to the designer. The vestry is to be on the south side of the building (and towards the western end of the church a baptistery chapel is suggested, about 40ft. long by 15ft. wide, with an altar in it adapted to week-day and early celebrations. This chapel, if introduced, should be so located as to be easily entered from the church without exposing the users to draughts from, or noises at, the main entrance to the building. It would be open to the church, so that the font and baptismal service may be readily seen from the nave). The organ is to open into the choir, and the pulpit is to be on the north side of chancel arch. The seating to be shown on the plan, and the accommodation given in a table. A passageway for the use of communicants returning from the Sacrament would be an advantage. The church is to be inexpensive, but dignified in treatment, and red brick and stone to be used both inside and out. Roofs in timber, covered with slates. There is to be no tower or spire; but accommodation is required for three bells, one to be used for the sanctus, though hung with the others. Plans and sections may be to 1-16in. to the foot; other drawings,  $\frac{1}{4}$ th scale. A sketch-view is desirable.

The question of the morning chapel placed nearer the main entrance to the church than is common in most churches of recent design has been fairly well dealt with by "Mysteriarch," and although the vestries are divided, the arrangement has its advantages. The necessity of passing through the choir-vestry to reach the heating chamber is certainly not good, and the need of a w.c. is by no means established—such places nearly always become a nuisance. The sanctuary is not furnished as it might have been, and at least a short length of communion-rail for infirm persons' use is desirable, to the depth, say, of the choir-stalls. The return-way for communicants is well managed, and the rood-screen to the chancel is suggestively contrived with its three openings, one of which leads to the pulpit. Architecturally, the design is distinctly clever and suitable, though we do not approve unreservedly of all its details. The battered buttresses of the organ-loft transept would add quaintness; but the priest's door is crushed rather in effect by the line of so dominating a structure coming immediately on to one side of the little pointed arch. The narrow nave would be made to look more narrow than it actually is by thus inclosing the roof beyond the queen posts, and the contrivance gives a pinched and dark appearance just where most breadth is needed. "Owl" has endeavoured to be original; but his design is incoherent, and lacking in the grace of proportion. The bell-turret is not ecclesiastically treated, and the east front is uninteresting and commonplace. Empty niches serve no good purpose in the gables, and the tracery of the windows is but poorly conceived, with no evidence of that beauty which good forms alone can secure. The "horse-collar" tracery

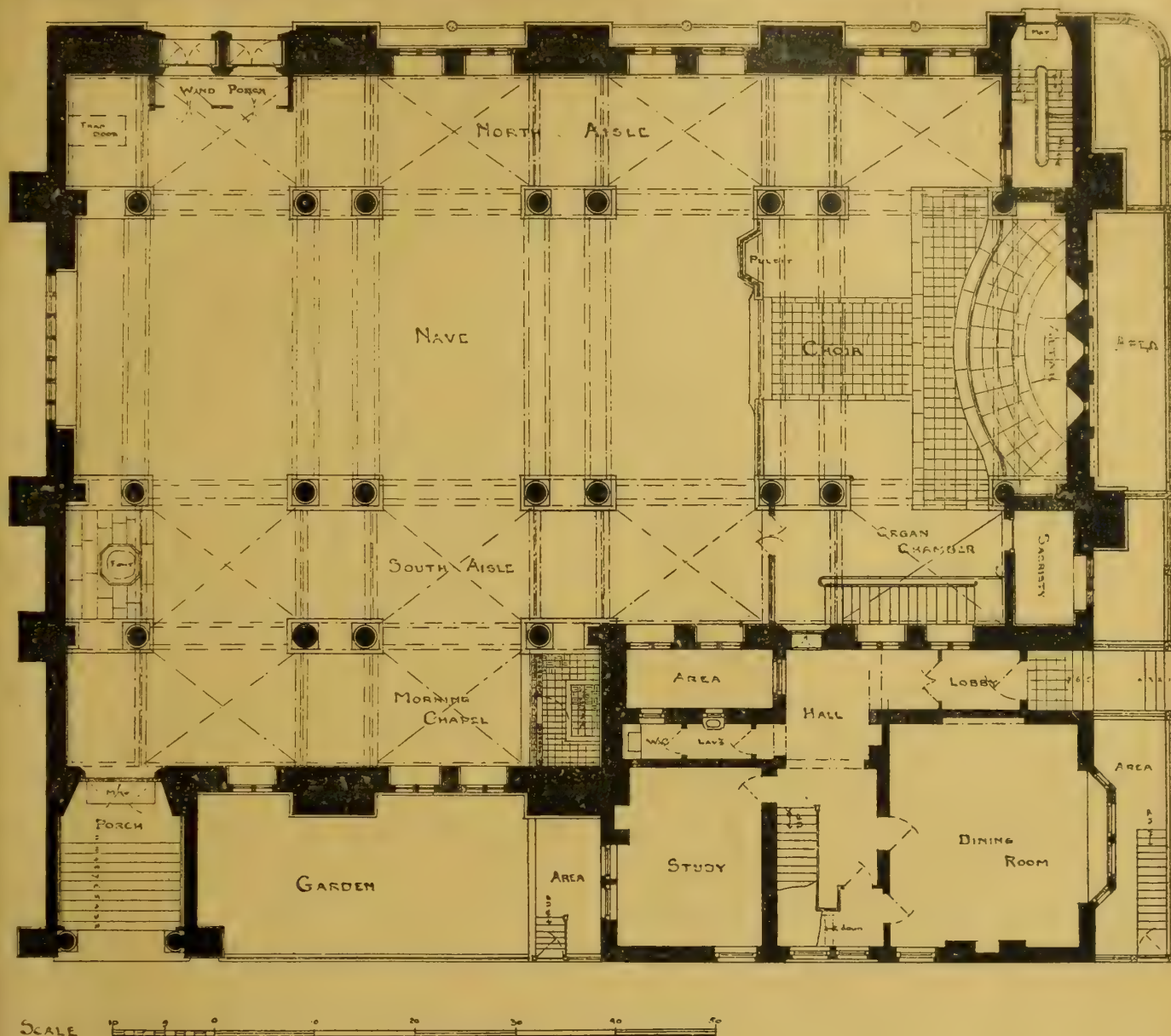
of St. Mary's Church, Warwick, and other kindred examples of Debased Gothic is ugly enough; but "Owl," who should be really wise enough to know better, has "gone one worse." "Cycle" is rigidly correct, and his ideas are limited by the recognised regulation work of the modern church builder of the ecclesiological school, whose ideal was based at least on strictly "proper" lines. The uncommon conditions, which our scheme stipulated for, ill accord with so unimaginative a design as this, though we are bound to recognise the author's care and truthful reference to models of the type which found much popular favour not very many years ago. Besides this recognition of industry, we are obliged to admit that the designs which follow leave us scarcely a choice, and so "Cycle" is awarded the third place. We would advise him, however, not to relax his carefulness, but to study the works of such men as Mr. J. L. Pearson, Mr. G. G. Scott, jun., and Mr. Bentley, and to pay a visit to St. Anselm's Church just erected in Davies-street, W., by Messrs. Balfour and Turner, the architects. We do not endorse its architecture, but its plan is distinctly suggestive. "Tadpole" adopts the English Renaissance of the ordinary City of London church type, and he does not achieve much success with such uncompromising conditions. Buildings of this kind left bald and bare, like some of the modern Italian churches built by the Roman Church in this country, are most uninteresting and depressing in effect. The big square-paned windows of wide proportions introduced by "Tadpole" are ungainly and crude. The plan is better in its arrangements; but we note that no return way has been provided for the use of communicants, and the organ is very much boxed in. "Nala" did well to take Mr. James Brooks as a guide, but he follows him a very long way off. Another time let the copy be more exactly near to the original, and in the end "Nala" may walk alone. "Oberon" trusts more to his own ideas, and scarcely learns so much as if he had adopted a good master's work for a model. We do not expect all who take part in these essays to evince much novelty or freshness of ideas—if they do, so much the better for those who can thus distinguish themselves. "Oberon" has taken pains, and we praise him for his care. "Dessinateur" is an untidy draughtsman, and has little consideration for the quiet sanctity of a church chancel, seeing that he has encumbered his plan with street doors on either side of the communicants' rail. "La Cigale" hardly does himself justice, or his design either, so badly has he located his drawings on the sheet. "Canary" sends a design which is very much overdone, in a type of Gothic, which, fortunately, has seen its best days, and is not likely to be revived. "Kaffir" is more practically severe; but his church looks somewhat like a cheap Nonconformist mission-hall or meeting-house. "Balbus" locates his morning chapel flank on at the west end of the nave, placing the altar northwards. The interior is thereby exposed to every intruder at the main entry, to say nothing of the draughts and noise. Narrow aisles are the chief feature in this contributor's plan of the nave. "Ghiberti" comes next with a double hammer-beam roof over a nave about 22ft. wide! The work throughout is crude and poor. "Beckington" places his morning chapel by the side of the high altar, and his font is situated on the communicants' step! "Moor" has square-headed traceried windows, and low proportions govern his design, which fails entirely to realise the problem with which we set out. The chosen design redeems the competition, at least, from entire failure.

## ST. ANSELM'S CHURCH, DAVIES STREET, MAYFAIR.

THIS church, consecrated last Saturday, by the Bishop of London, replaces the old Hanover Church, the portico of which forms such a prominent feature on the west side of Regent-street. It is erected under a private Act of Parliament, the money to be realised by the sale of the old church furnishing the building and endowment funds, the site being presented by the Duke of Westminster. The design is somewhat novel, for, although the conception is essentially Mediæval, no pointed arches have been used. We hope at an early date to give some views of the building, and now we print a copy of the principal plan, which is exceedingly interesting.

Houses existed on the site of the church and vicarage previous to their erection, which neces-





sitated taking the foundations down below the old level. The whole of the church, therefore, has a basement under it, part of which is used for clergy and choir vestries, heating-chamber, lavatory, and w.c.'s. Advantage has been taken of this basement to run fresh-air trunks along under the ceiling, in which are contained hot-water pipes. The air is drawn through fine copper wire gauze (86 holes to the inch), and delivered into the church at the window sills. This method of warming and ventilating the building is supplemented by radiators, which are placed in recesses in the main walls. There are also "extract" flues starting at the level of the floor of the church and running up in the buttresses. The passage of the air up these flues is accelerated by means of radiators fixed in the flues. The floor of the church is formed with steel joists bedded in concrete 10in. thick, and covered on the surface with pitch-pine blocks. The walls are of brick, with Portland stone external dressings and blue York stone internal dressings. The walls are plastered inside, the plaster being finished in one coat about  $\frac{1}{2}$ in. thick, the trowel only being used for the purpose. The roofs are of pitch-pine,  $1\frac{1}{2}$ in. vertical boarding being used instead of rafters. The building is so arranged that all parts can be approached without the aid of scaffolding. The chancel is paved with Irish green, Irish black, and Pavenza marble. The altar rail is of solid brass throughout, and has been executed by Mr. Thomas Elsley. The choir seats and screen are of teak. The altar rail to the morning chapel is of ebony. The font is of black granite in one block, weighing  $3\frac{1}{2}$  tons, and stands on green granite paving. The dado round the church and the lining to porches is of glass tiles. The chancel wall (not

yet fixed) is to be of Irish-green marble, with a bronze railing on the top. The builders were Messrs. W. Holt and Sons, of Croydon, and the architects Messrs. Balfour and Turner.

#### THE CONDITIONS OF BUILDING CONTRACTS.

AN interesting paper on the above subject was read on Monday evening last at the ordinary general meeting of the Surveyors' Institution by Mr. A. A. Hudson, Barrister-at-Law, and one of the members of the Tribunal of Appeal under the London Building Act, 1894. The author claimed some indulgence for his treatment of the subject, which was, he said, such a wide one that he could do no more than generalise upon it. There are, he said, few contracts which require such care in drafting as building contracts, and in order to prove this he pointed out some particulars in which they differ materially. In some contracts the parties know what they are contracting about; but this is not the case with the ordinary employer, who could not, as a rule, understand either the specification or the plans, except in the most elementary way. He must have someone—the architect, engineer, or surveyor—to assist and guide him. The first condition to be considered was the one which fixed the standard of excellence required for the work. It might be described as to be of the best, or as to the satisfaction of the employer or the architect, or of both; or it might, as most frequently was the case, be described as of the best, and to the satisfaction of the architect. The description of work done in the best manner was, he thought, too vague, and

left the way open to disputes. The other description was almost equally objectionable, for if work has to be done to the approval of the employer, such approval must be reasonable, for no one can be judge in his own cause unless the parties agree to such a condition in express terms. There may be endless disputes as to what is reasonable. To avoid such disputes under either description it has been found convenient that the work should be described as done to the satisfaction of a third party—the architect, engineer, or surveyor, whose decision has been held to be final, although he is, perhaps, naturally biased in favour of the employer. The effect of a condition of the kind is to leave the standard of excellence to be fixed by the mind of the architect, although the insertion of the description of "best" or "second best" may serve to decide a point if the architect is by any reason prevented from approving. Another instance might be given by supposing a case where the architect or engineer never exercised his judgment at all. This kind of contract might be very satisfactory to the building owner, but was not generally so to builders. They agreed to the decision of the architect being final in certain matters, but within limits. The builder does not agree to do work to the satisfaction of the architect, but to his reasonable satisfaction, nor does he agree that if he does not satisfy the architect he shall not be paid at all, nor that the employer may take possession of the works, and turn the builder out if he does not satisfy the architect; nor that the architect shall have power to alter the work or reject the materials at the builder's expense. In such matters the builders claimed a reference to arbitration. It could not, he thought, be said that a builder was unreasonable who objected to



be placed, bound hand and foot, in the power of a person whose natural instincts were to decide in favour of his employer. Every contract must be really dependent on the person employed as architect or engineer and the kind of person or body in the position of employer. Contractors for large railway and other works did not hesitate to leave themselves in the hands of the engineer, while builders would not enter into a contract for a few hundreds without an arbitration clause, and the reason appeared to be that engineers of large companies, having absolute control of the money spent, and being without fear of any demur on the part of their employers, were free to act fairly as between employer and contractor. In small works, on the other hand, a client of limited means not only questions the extras, but also the authority of the architect to order them. In the case of contracts with public bodies or corporations, neither the builder nor the engineer were in an enviable position, for the work of the former was subject to the scrutiny of many persons anxious to find fault, while the latter was not free to exercise his full discretion. The next important point was that work done under a building contract was done on the property of the employer, and being attached to the soil, became the property of the owner of the soil. Thus, while goods in the ordinary way might be returned if not according to contract, work attached to the soil could not be returned. This fact necessitated conditions being inserted in building contracts to provide what was to happen if the work was defective or not approved. These consisted generally in a power to call upon the builder to re-execute the work, and in the event of his failure to do so, a power to the architect to employ others to do it, or even in some cases power to the employer to take the work out of the builder's hands. The question arose, Was the builder justified in placing himself entirely in the hands of a person who might be expected to be in favour of the other party to the contract?—and was the employer justified in signing a contract in which there might be a dispute about every item? The author thought that both employer and builder would do better to leave themselves in the hands of an architect, engineer, or surveyor who could be relied upon to exercise his sound judgment without any fear or favour. Under a contract where the decision of the architect or engineer is final, a power of dealing with the property of a fellow creature was conferred greater than that of any judge, and it was of the utmost importance that person possessing such powers should be absolutely fair and impartial. Special conditions as to payments were also necessary in building contracts: first, because builders generally required advances on account, and secondly, because variations were frequent, and the employer naturally desired that his architect should settle these matters. The best contract, in the interest of the employer, was that the builder should do the work, in a certain time, to the satisfaction of the architect, and be paid only such an amount as he certified to be due. The Builders' Association contended, however, that while they did not mind carrying out all the architect required, they wanted to be adequately paid, and they no doubt thought that the bias of the architect in favour of his employer would tend to tempt him to cut down prices. There also seemed to be some doubt whether many architects, as distinguished from surveyors, were sufficiently acquainted with prices to be qualified to value work for payment, and it must not be forgotten, the author hinted, that architects themselves were at some variance as to whether they should be regarded as artists or architects. An artist would be the last man in whose judgment a builder would have confidence on a question of prices. These seemed to be some of the reasons why builders objected to be left entirely in the hands of the architect as to payment. The employment of a third person—a quantity surveyor—seemed to be the best solution of the difficulty. His experience and knowledge of prices to date would be eminently serviceable in this capacity. It might be a condition of the contract that he should not only measure up the work, but should value it as it proceeded, and that his certificate should be made the basis of payments. To avoid any suggestion of bias, he should be paid half by the employer, and half by the builder, and should be responsible to both. It might be objected that this would bring the question of quantities and quantity surveyors before the employer, instead of keeping them in the background; but he thought that

would be a step in the right direction. His certificate for payment should be final, and, if he had been nominated both by the builder and the architect, no possible objection could be raised to this. But the payment thus arrived at would only be in respect of work done. Damages for breach of contract would best be settled by arbitration. The arbitration clause of a contract was a most important one. Arbitrations were either general—a submission of all disputes—or limited—submitting particular disputes only. The arbitration clause agreed upon between the R.I.B.A. and the Builders' Association was a limited one, the architect's decision on certain matters not being open to dispute. If the architect's decision was thus final on certain matters, and the quantity surveyor's certificate final as to payment, such matters might be excluded from the submission. But too often there was one clause submitting all matters to arbitration, and another clause making the architect's decision final in regard of some of the same matters. The questions of value and of measurement should be excluded from the arbitration, and be left to valuation. Where two clauses seemed to contradict each other in the way he had named, the Court of Appeal held that the arbitration clause was to be considered a proviso to the certificate clause. If disputes arose before the architect had certified or decided matters on which his decision was final, the arbitration clause came into force; but if the architect had decided or certified before the dispute arose, his decision was final. The certificate clause was a clause to prevent disputes arising. Thus, if disputes arose before the certificate was given, the architect's jurisdiction was ousted. The case which governed this point was *Lloyd v. Milward*, and arose upon the construction of Clauses 18 and 20 of the R.I.B.A. Conditions, and the importance of that decision could hardly be overated. The only way to avoid the difficulty which it created was to exclude from the arbitration clause matters not to be the subject of arbitration. Mr. Hudson proceeded to quote several cases which bore upon the points he had raised, and a vote of thanks having been proposed by Mr. H. H. Collins and seconded by Mr. G. Corderoy, the discussion of the paper was adjourned.

#### CONCRETE CONSTRUCTION.\*

"CONCRETE," or "growing together," as the word expresses, is a solid mass formed with cement, water, and irregular pieces of brick, stone, sand, &c., when brought into contact with each other.

The Romans were the first great concrete builders, and some of their structures have not been surpassed in magnitude to this day. They made use of it before the year 500 B.C., and Vitruvius, who wrote in the first century after Christ, describes how to make concrete pavements and floors, and concrete walls around wells. His specification, which Gwilt translates, might be substituted, without much detriment, for the clauses in some modern specifications.

The introduction of Portland cement, which is the strongest cement ever known, contributed largely to spread the use of concrete in building. Now every architect uses it for very many purposes, and in combination with iron and steel. Cottages were built of it in 1832 which in 1872, Mr. Drake tells us, were perfectly sound and free from damp. Mr. Wilkinson, the founder of my firm, took out a patent in 1854 for fireproof construction, which in many respects has never been improved upon, and which showed that he correctly appreciated the great strength of concrete in compression, and its weakness in tension—a weakness, however, possessed by all other limes and cements in much greater degree.

Portland cement is first mentioned in a patent granted to Joseph Aspdin, a bricklayer, of Leeds, in 1824, the name "Portland" being given to it in consequence of a resemblance of its colour to that of Portland stone. Aspdin's cement was a mixture of pulverised quicklime and clay, and was a very different material from the cement of to-day. In 1844, Mr. J. C. Johnson introduced the manufacture of true Portland cement into the works of Messrs. J. B. White and Co. After a time it began to be better appreciated, and it is estimated that the present annual production exceeds 4,000,000 tons.

A lecture delivered by Mr. PHILIP HOBBS, Managing Director of W. B. Wilkinson and Co., Ltd., at a meeting of the Northern Architectural Association in the Art Gallery, Newcastle-on-Tyne, Feb. 12, 1896.

The raw materials from which Portland cement is manufactured vary to a considerable extent. On the Thames and Medway, chalk and river-mud are the constituents; on the Tyne, chalk and clay; while in Warwickshire and Dorsetshire blue lias limestone and shale are used. The aim of the manufacturers is to obtain a mixture of clay and lime, in which the carbonate of lime before calcination shall be from 72 to 77 per cent. This is an easy matter where chalk is used, which is nearly pure carbonate of lime, but much more difficult with limestone, which consists partly of clay and partly of carbonate of lime, necessitating frequent analysis of the stone.

Over-clayed compounds are liable to fuse in burning, and as this would render the clinker useless for cement, they are burnt at lower temperatures, and produce an inferior article.

An excess of lime has also disadvantages, for it is very likely to produce a cement containing "caustic," or, as we call it, "free" lime, unless burnt at a very high temperature, very finely ground and air slaked before it is used.

It is the clay that possesses the power of rendering lime and cement hydraulic, and while, roughly speaking, increased quantities of clay confer increased rapidity of "set," the other considerations I have mentioned affect the real value of the product.

When we remember the important uses to which concrete is put, it is absolutely necessary to know the character of the cement, and the tests of most importance are for ascertaining the "fineness," "tensile strength," and "soundness." The specific gravity is also thought to be of importance, and the weight is often specified, yet in 22 years' practice I have never seen this test applied. Indeed, it must only be considered in connection with its fineness, age, &c., as an ordinary ground cement weighing 115lb. per bushel would only weigh 90lb. when finely ground, and a cement that just after grinding weighs 120lb. to the bushel in a few days will weigh 115lb., when six months old 100lb., and at the end of the year only 95lb. per bushel.

Only the very finely-ground portion of the cement has any value, the coarse particles being of no use, but rather a source of danger, a certain amount of slaking action taking place after having been mixed with water some time, and as the slaking of lime is always accompanied with increase of bulk, this has the effect of disintegrating to some extent the remaining portion of the cement, minute cracks or absolute failure being the result. Fine cement does not require air slaking. The ordinary specification for fineness says that 90 per cent. of the cement shall pass through a sieve with 50 wires to the inch—i.e., 2,500 meshes to the square inch; but out of every 100 tons of this quality, 40 tons are of no more use than 40 tons of the same sized sand. As far as my own observations go, only what will pass the 180 sieve (32,400 meshes to the square inch) has any cementitious value. Of the 40 tons of coarse particles, part is so hard burnt that water has no effect on it, and part is good cement insufficiently ground.

As far as I can ascertain, the extra cost of grinding is about 2s. per ton to make 90 per cent. pass the 80 sieve, another 2s. to make 90 per cent. pass the 120 sieve, and 2s. more the 180 sieve; and up to this limit I think the advantages of fine grinding are greatly in excess of the increased cost, each additional 2s. giving 20 per cent. extra strength.

A most important test, a most difficult one, and in many respects a most fallacious one, is the testing the tensile strength of neat cement, especially as regards the usual seven days' trial, one in moulds and six in water.

The temperature, the amount of water, the rate at which the strain is applied, all affect the result. A cement that gives great strength in a short time may be a dangerous one, owing to the presence of too much lime, and it may fall to pieces at the end of six months. Again, the strength of neat cement does not always represent its true value when mixed with an aggregate. For instance, ordinary cement will generally bear a greater tensile strain (when mixed neat) than the very fine; but at the end of twelve months concrete made with 5 of aggregate to 1 of cement, with the latter, will be as strong as that mixed 3 to 1 of the former.

A standard sand is now generally used, which will all pass the 20 sieve, and all be retained by the 30 sieve. It is obtained at Leighton Buzzard. 3 of sand to 1 of cement is the usual test, the briquette being kept one day in the mould and 27



days in water. A good cement should bear from 200lb. to 250lb. per square inch at the end of that time. This is a much more reliable test than that with the pure cement; but the length of time occupied precludes it from universal adoption.

A cement may be very fine, and of great strength; but if unsound, should not be used. The simplest test is to make two pats of neat cement, 4in. in diameter and about 3in. thick, and thin at the edges, and put them on glass. When set hard place one in water, and examine it daily. If very fine cracks appear at the edges, and they curl and leave the glass, have nothing to do with it. The other pat keep dry, watch the colour, and see if it disintegrates.

A highly-burnt cement sets more slowly than one lightly burnt. An excess of clay increases the rapidity of setting, and excess of lime has an opposite effect. The best slow-setting cements are better than the best quick-setting. They are stronger, and much more convenient of manipulation. If a pat of cement be indented with the gentle pressure of a thumb-nail at the end of two hours, it may be considered slow-setting.

"Free lime" is our bugbear, and the manufacturers' difficulty. The latter say that ordinary Portland cement does not contain more than 1 per cent. of free lime; but this is guesswork, as no chemist can tell the proportion. Judging from the increase of bulk which ensues from air slaking, I am sure some cements contain 4 or 5 per cent. of free lime. Fill a cask with new cement and head it up; it will burst the cask to pieces. Bags, though slackly tied, are burst with the expansion through air slaking, and when we remember that calcium oxide is converted by slaking into calcium hydrate, a substance three times its bulk, we are not surprised.

1. All cements expand more or less when hardening in water.

2. The expansion of good cement is so slight that it need hardly be taken into consideration.

3. It is greatest when the increase of strength is most active.

4. It diminishes in proportion to the addition of sand.

5. It is greatest with new cement, and least with that which has been kept in stock.

6. It is greatest with over-limed or badly-burnt cements. All cements contract on drying, and expand on being put in water. The almost universal opinion is that concrete, like almost all other materials, expands and contracts with heat and cold. My own observations lead me to a different conclusion—viz., that it is wet and dry weather that cause expansion and contraction. If you notice the floors in the London hotels, clubs, and other large buildings, you will see an irregular crack across the corridors about every 12ft. The heat has, in the course of time, withdrawn all the moisture from the concrete, hence the contraction. Again, observe the joints of the sections in a long-exposed surface, like the ends of Darlington railway platforms. You will find them open in the hot, dry summer weather, and closed in the cold and wet winter.

The manufacturers on the Tyne and East Coast—with the exception (as far as I know) of two firms on the Tyne—are grinding a large quantity of slag with their cement, which they say provides a silica that the free lime readily combines with, or has an affinity for, and thus lessens the danger from free lime, and many makers on the Thames are using Kentish rag, &c. The true reason, I venture to think, is the cheapening of production. They say the results of the tensile tests with neat cements are good, but I cannot think they would be with an aggregate of 3 of sand to 1 of cement. The usual analysis of the Cleveland slag is exactly like the old Roman pozzuolana, which was a very perfect aggregate, and a little of it ground with cement might improve the neat tests, just as a little sand would improve the test of the very fine and best cements. I am sure of this—that the hydraulic property is deteriorated to the extent of the adulteration.

Water is necessary to the setting and hardening of cement. It does not form a merely mechanical mixture, but it unites chemically with them, forming new compounds of an indurating nature. I am sorry that I do not know anything of chemistry, and cannot explain the changes that occur; but I suppose some of the lime is dissolved by the water, and crystallisation suddenly occurs. An excess of water is injurious to the strength of the concrete, and greatly retards the setting; but it is much better to err in this direction, than by

mixing with an insufficient quantity, as the concrete is more dense, less permeable to water, and all the cement has an opportunity of crystallising. Precautions should always be taken to prevent the loss of water before it has done its work. Mr. Sutcliffe mentions, in his admirable work on "Concrete," an instance of some cement being applied to three brick walls inside a room; on one with the greatest success, on another with only partial success, whilst on the last it was an utter failure, becoming rotten and crumbling away. The first was a quite new and damp wall; the second, an outer wall, was slightly damp, and the third, an old internal wall, quite dry.

Cement set in the air, and then kept in water, is very much stronger than when kept in the air; but concrete deposited in water, is weaker than concrete that has set in air.

With neat cement adhesion may be calculated at about 100lb. per square inch; with four of sand to one of cement at about 25lb.

The selection of an aggregate must be influenced by the locality; but the strength of the concrete depends very much on the quality of the aggregate. It must be clean, angular, and hard, and of all sizes, from the largest most suitable to the thickness of concrete required, to the fine grains of sand, gravel, and shingle, broken stone, igneous rocks, flints, sandstones, limestones, broken bricks, burnt clay, coke-breeze, slag, shells, &c., all of which are used.

In foundations and walls where the concrete is subject to compression, gravel is a very good material, but it is not suitable for floors, where it is subject to transverse strains, because of its weight, the smoothness of its stones, and the small resistance it offers to the action of fire.

Of the broken stones, limestone gives much the best results.

Granite and other rocks are best for surfaces exposed to much wear, but are not suitable for floors for carrying weights and resisting fire.

Flints are extremely durable, and are unaffected by any atmospheric changes and impurities.

Broken bricks, as we call them in Newcastle, are a mixture of hard burnt bricks, retorts, clinkers from the engine furnaces, &c., and these when machine broken form the best aggregate for floors intended to be fire-resisting and to carry great weights. They have already been subjected to great heat, and are sufficiently porous to give a good key to the cement.

Burnt clay, if well burnt, makes an excellent concrete; but underburnt clay makes wretched stuff.

Coke-breeze, so much used in London, on account of its lightness, is not not so strong as any of the materials mentioned, on account of its inherent weakness and also its fineness. It is very porous, and requires a large proportion of cement. It can be nailed to, so that floor-boards can be laid on it without joists.

Slag is very much used near the iron and steel works, but is never to be relied on, as it may sometimes contain too much lime. Excellent work may be made with it 99 times, and the 100th it may blow all to pieces. The analysis of the Cleveland slag is, as I said before, exactly the same as that of the pozzuolana—so much used by the Romans as an aggregate. It has been used for making cement, but every batch burned required analysing, as the quality of the slag varied so much.

The proportions of dry ingredients depends very much on the size and shape of the pieces, and the quality of the aggregate. The larger the aggregate the richer the concrete, because of the lesser surface to be covered with the cement film. This is easily understood when we consider that a 2in. cube has eight times the bulk of a 1in. cube, but only four times the superficial area. The smaller the aggregate, the finer the surface of the finished concrete. In my opinion, the aggregate should be about one-fifth of the thickness of the floor, so that for a 2in. floor the crushed material should pass a 3in. sieve, and for 3in. a 4in. sieve, and for a 6in. floor the largest pieces may be 1½in., and as long as every piece is covered with cement there is nothing gained by using a larger proportion of it. With the granite and crushed bricks there is no advantage in making the proportion richer than 2 to 1 of cement, although there may be in coke-breeze concrete. Engineers and contractors differ very much as to the quantity of material necessary to make a cubic yard of concrete, and no doubt this is due to the difference in the broken stone or brick that is used. When hand broken and gravel mixed, the large pieces ride one on the

other and cannot be consolidated; hence only 24 bushels of aggregate and four bushels of cement are put into the space. But when machine broken, with the proper proportion of all sizes, as much as 20 bushels of aggregate and five of cement are required—a truly remarkable quantity when it is remembered that there are only 22 bushels of dry measure to a cubic yard. I have more than once proved this myself, but, of course, had to ram the concrete well, to compress it and render it solid and free from voids. This ramming must not be continued too long, or it will result in a loss of strength. For the thin paving floors one layer is strongest, but it is difficult to get a perfectly level surface, such as is required for a tennis court, unless it is laid in two coats. The top coat should follow the bottom the next day at latest, in order to get perfect adhesion. Not more than 3in. can be laid in one layer, if anything like a correct surface is required. Large areas should, when exposed, always be laid in sections, so that the contraction should take place at the joints. It is astonishing the weights that these thin floors will carry when laid on a good foundation. I can point out 3in. granite concrete floors that are constantly carrying moving loads of from 5 to 7 tons, and have stood firm for many years, and were it not for the time necessary for maturing the concrete, no better or cheaper roadway could be had for our streets.

I have never tried myself any experiments with fire, although I have had some experience as a manufacturer of these fire-resistance floors, and also as captain of a fire brigade for many years, and I can endorse the testimony of Mr. Swanton, of the Metropolitan Salvage Corps, "that the effect of fire on concrete is scarcely perceptible in ordinary fires; and only in very large fires, when nearly red-hot, when the water is thrown on it, does it split into irregular forms, and even then the result cannot be compared to the disastrous effect on ordinary stone."

Concrete is like cast iron, its tensile strength is far inferior to its compressive strength, so that it is not a material for resisting transverse stress; but this disadvantage is met by imbedding steel or wrought-iron bars in the lower half of the concrete, with the very satisfactory result that its strength can be increased tenfold. The ratio extending between the tensile and compressive strength of concrete may be taken at 10 to 1, although in many cases it must be more than this. Take the case of a concrete floor where the top 2in. is formed with 2 of granite to 1 of cement, the compressive strength of which is about 5,600lb. per square inch; and where the lower 5in. is made with 5 of crushed bricks to 1 of cement, the tensile strength of which is, at most, 250lb. per square inch. Now wrought iron has a tensile strength of 56,000 per square inch, and by placing the bars low down, and of a shape that cannot slip, we can make up for the deficiency in the strength of the concrete, and make the lower half equally strong with the upper.

Mr. Wilkinson found out at a very early date this weakness of concrete, and you will see by the original drawings on the wall that he strengthened the lower half of his floors by using steel-wire rope in tension. Our aim is to give the lower half of the beam the same strength as the upper; but this is very difficult, as the concrete varies so much with the different materials used, and "practice" varies in so many ways from "experiments" carefully carried out by skilful hands.

Approximately the sectional area of the iron should be about 1-60th the sectional area of the concrete—that is, if the greatest strength is required. So that in a beam 6in. by 6in. 36-60ths or 3-5ths of a square inch of iron should be imbedded. Let us see how this works out with this beam 6in. by 6in. When loaded, the upper half will be in compression, and the lower half in tension. The greatest stress will be, on the upper surface of the beam, say, 2,500lb. per square inch in compression, and on the bottom surface in tension, say, 250lb. per square inch. These diminish to zero at the neutral axis; the mean stress, therefore, is one-half these figures. In each case the resistance will be the mean stress × the area in inches × one-third the depth of the beam in inches, that being the distance of the centres of pressure of the upper and lower halves from the neutral axis. The resistance of the upper half of the beam will be—

$$1,250 \times (6\text{in.} \times 3\text{in.}) \times 2\text{in.} = 45,000\text{in.-lb.}$$

The resistance of the lower half will be—

$$125 \times (6\text{in.} \times 3\text{in.}) \times 2\text{in.} = 4,500\text{in.-lb.}$$



The additional resistance to be provided by the wrought iron is 40,500in.-lb. The iron is to be inserted 2in. below the neutral axis. The quantity of iron to be provided is, therefore—

$$\frac{40,500}{56,000 \times 2} = .36 \text{sq.in.}$$

So that this 6in. by 6in. beam should not break until it had 40cwt. suspended from its centre with both ends supported, with a 10ft. span. So much for theory, and provided the bars *do not* slip.

Now for practice; and I shall quote from Mr. Kircaldy's experiments on Mr. Hyatt's and Mr. Edward's beams, and from Prof. Weighton's on my own. Mr. Hyatt's experiments point to the slipping of the iron, and to prevent this he riveted the round ties through plates at the end of the beams, turned up the ends of the flat bars, and employed bolts through others; but in nearly every instance the bars broke through the bolt-holes.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement, with 7 bars 6in. by  $\frac{1}{2}$ in., threaded with  $\frac{1}{2}$ in. rods; broke at cross-rods, 224.53cwt., iron 1 to 38.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement, with 7 bars 6in. by  $\frac{1}{2}$ in., threaded with  $\frac{1}{2}$ in. rods; broke at cross-rods, 230.96cwt., iron 1 to 46.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement, with 7 bars 4in. by  $\frac{1}{2}$ in., threaded with  $\frac{1}{2}$ in. rods; broke at cross-rods, 213.25cwt., iron 1 to 53.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement, with 7 bars 3in. by  $\frac{1}{2}$ in., threaded with  $\frac{1}{2}$ in. rods; broke at cross-rods, 189.48cwt., iron 1 to 80.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement, with 7 bars 2in. by  $\frac{1}{2}$ in., threaded with  $\frac{1}{2}$ in. rods; broke at cross-rods, 146.58cwt., iron 1 to 125.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement; no iron (exceptionally weak); 13.25cwt., iron *nil*.

Beam, 12in. wide by 8in. deep, 5ft. span; 2 of brick to 1 cement, with five  $\frac{1}{2}$ in. round rods (ties not broken); 82.8cwt., iron 1 to 150.

**Notice.**—The simple concrete beam ought to have stood three times as much. Still, the enormous gain from the use of so little iron is very wonderful. The first beam had the most iron, but had not the greatest strength, the reason being that one-third of the iron was above the centre, and added nothing to the tensile strength, whilst it decreased the compressional strength of the concrete. The third beam, with two-thirds the weight of iron, was only 5 per cent. weaker than the first. It shows that the iron above the neutral axis is of little or no use, and that the most advantageous position for the tension rods is near the bottom of the beam.

Mr. Edward's experiments do not show any slip between the concrete and the iron rods; but his concrete was richer, being 1 of cement to 1 of coke-breeze, and he may have taken more pains to get perfect adhesion. In one case it was said that one rod was perceptibly attenuated.

Beam, 7in. deep by 3in. wide, 10ft. span; 1 of coke to 1 of cement, with three  $\frac{1}{2}$ in. round rods; crushed at the top with 25.66cwt., iron 1 to 33.

Beam, 5in. deep by 3in. wide, 6ft. span; 1 of coke to 1 of cement, with four  $\frac{1}{2}$ in. round rods; cracked below with 19.59cwt., iron 49.

Beam, 5in. deep by 3in. wide, 6ft. span, 1 of coke to 1 of cement, with three  $\frac{1}{2}$ in. round rods; top and bottom with 22.33cwt., 41 tons.

Beam, 5in. deep by 3in. wide, 6ft. span; 1 of coke to 1 of cement; no iron; suddenly with 3.85cwt.

The first, third, and fourth beams were only seven days old, and the second 21 days; but if very new and far short of their ultimate strength, they were also very rich in cement. Notice that it was with one-fortieth the sectional area of the beam in iron, that a simultaneous fracture at the top and bottom of the beam occurred. In practice we cannot afford such rich concrete. We usually make the lower part of a floor 4 or 5 of aggregate to 1 of cement, and the top inch of a good wearing waterproof material 2 to 1. So that I think one-sixtieth of the sectional area in iron will give about the best results. Of this iron, in my opinion, two-thirds should be in the direction of the shortest bearing and one-third in the opposite direction. The iron should never be painted or have any anti-rust composition on it, as cement will adhere firmly to iron in its natural state; but in order to secure as much adhesion as possible, it should be painted over with cement and water just previous to being covered with the concrete.

(To be continued.)

## SANITATION AND DISPOSAL OF REFUSE.

**A**T the meeting of the Edinburgh Architectural Association on the 13th inst., a discussion took place on the subject of sanitation. Dr. Rowand Anderson, president, occupied the chair, and there was a large attendance. The President, in opening the discussion, referred to the necessity of architects taking an interest in science, and especially in the science of sanitation. It was not until about twenty years ago that sanitary science as it is now understood came into existence. Seeing that water carriage was the accepted method of getting rid of house sewage, great attention had been given to perfecting this system, and plumber work, where fairly paid for and executed, was now as near perfection as it was likely to be until some new system of house sewerage was tried. It failed, however, in severe frost, and if further improvement was to be made on the plumber work of houses, it should be in the direction of securing it against damage by frost. The water-main in the street should be laid at least 4ft. underground. Increased precautions must also be taken to secure cisterns against frost, and a simple means of emptying pipes and shutting off their supply from the cisterns should be provided. They ought to aim at some arrangement whereby all the pipes could be kept together and placed in an inside shaft—one that would admit of access to it for examination and repairs—that this shaft should be well ventilated and situated about the centre of the house, so that all the ventilating pipes could be carried to the apex of the roof, and thus avoid the disfigurement of their buildings. In a self-contained house, heat during exceptional frost could easily be applied to this shaft. For tenements he suggested a further development of this idea, and in considering its applicability to houses in flats, other two questions of sanitation came to the front—viz., the proper lighting of the lobbies of such houses, and the accommodation for the domestic servant. At present all the light the lobbies of such houses got came from a fanlight over the stair door, and one or more over the room doors. At the best this only produced visible darkness. The domestic servant was disposed of anyhow in a dark closet. In new property the side of this closet when next the kitchen was, he understood, generally left out. While this gave more light and air to the houses, it still left a most undesirable arrangement. He exhibited sketches showing the present arrangement, and another showing a suggested rearrangement of the interior space. A shaft measuring 10ft. by 8ft. 6in. was placed in the dividing walls, and this would be built with white-glazed bricks. The lobby of the house extended from the entrance door to the wall of this shaft, where was a window not less than 3ft. wide by 8ft. high. This would fully light up the lobby. The bath and water-closet of each house were so arranged that they did not face one another, and each had a ventilated and intermediate lobby, a most desirable feature where it could be obtained. The bath-rooms were lighted from this shaft, but did not ventilate into it. There were in the thickness of the division wall upright flues from each apartment, all having their outlet at the apex of the roofs and provided with a mica flap ventilator close to the ceiling to prevent a back-draught. Of course, fresh air must be introduced to the bath-room, but there was no difficulty in doing that. The shaft itself must also be provided at the bottom with a supply of air from the outside. The soil and ventilating pipes could be carried up the walls to the apex of the roof, and would be accessible for inspection and repairs. The space now given to the bath and water-closet he would convert into a room for the domestic servant, with light and air from the outside. They all knew, and many of them had very expensive experience of, the destruction to house property caused by the bursting or choking of pipes. As a precaution against damage from such causes, he suggested that all bathrooms and water-closets be kept one above the other, and that the floor be of cement concrete, and so arranged that if there was any flooding it could escape to the outside by means of an overflow pipe. A strip of 2ft. wide in the kitchen next the sinks would give additional security. It was unnecessary for him to discuss the various methods of treating sewage. He started with this proposition—that there should be no waste, and that what was taken out of the land ought to be returned to it. In Berlin and Paris the problem of the utilisation of sewage was

being solved in a satisfactory way, and waste land was being turned into fruitful farms and gardens. While we got rid of our sewage in an easy and expeditious, if wasteful, manner, we were still in a state of barbarism in dealing with house refuse. The erection of the destructor at Powderhall was, however, a step in the right direction, and he hoped the municipality would not rest till the other three were erected. The output of these destructors was very great, so great that, when the four were erected, the annual output of calcined matter would be something like 40,000 cubic yards per annum, equal to covering 16 acres 3ft. deep. Where were they to dispose of it? Clearly not on the top of cultivable land. There were waste lands inland where it could be deposited; but why not run it down to the sea, and reclaim by degrees the whole foreshore between Cramond and Musselburgh, barring the mussel-beds?

## CHIPS.

Mr. Alfred Button, son of Alderman L. Button, J.P., ex-Mayor of Southampton, and partner in the firm of L. Button and Son, builders, of that town, met with a very serious accident on Wednesday week. While walking over a building he fell through an open trap-door to the floor below, dislocating his spine, and has since remained in a critical condition.

The chimney belonging to the nearly-demolished Broughton-grove paper mill, Bury New-road, Manchester, was successfully razed to the ground on Thursday in last week. The weight of the chimney was estimated at 4,000 tons, its height was 270ft., and the thickness at base 7ft. 8in. Mr. J. Smith, of Rochdale, had charge of the razing operation. A gap was made at the base of the chimney, penetrating about half-way through, massive oak supports being inserted, saturated with paraffin. A large quantity of soaked wood was also thrown into the chimney, for the purpose of making a fire of sufficient fierceness to burn the oak supports quickly and evenly. Within five minutes of lighting the wood the chimney began to lean, and eventually fell on the prepared bed on the south side where the ground was clear.

The Manx High Court has sanctioned the sale of Greba Castle in the Isle of Man to Mr. Hall Caine for £1,025. It is a small sum for a castle; but it was explained that it had become dilapidated and out of repair.

The Coastguards' dwellings at Sandgate, which were destroyed by the great landslip, are now being demolished, and the Admiralty have decided to build new buildings for the coastguards on the same site. The remedial drainage, rendered necessary by the landslip, has proved successful, and confidence is now restored.

It is proposed to restore the ancient parish church of Gosforth. It is intended to take down the west end and extend the nave westward, take off the roof, and lower the walls, so as to give the roof more pitch, and carry the north wall back, in order to form another aisle, and make a part of the present transept into a vestry. The cost is estimated at £1,650.

A new temperance hall, erected in Fountain-street, Morley, was formally opened on Saturday. It has been built of local stone, and in the Early English style. It contains an assembly hall, with one of minor dimensions beneath, several ante-rooms, a kitchen, and a reading-room. The cost was £2,000.

A new Primitive Methodist chapel has just been opened at Aston Wear, Queen's Ferry. It is seated in pitch pine for 250 persons, and has been built from plans by Mr. George C. Hughes, of Queen's Ferry.

The fifteenth of the course of art lectures in connection with Dundee Fine Art Exhibition was delivered on Saturday evening by Mr. Robert F. Martin, South Kensington Museum. The subject was "Artistic Glasswork."

A new Wesleyan church was opened at Catford, in the Lewisham circuit, on Thursday in last week. The church will hold about 700, and has cost about £4,000.

St. John's Church, Tunbridge Wells, is about to be enlarged at a cost of £4,000, of which nearly £2,000 is promised. It is proposed to commence early in March. The work is divided into three parts—viz., building the south aisle and enlarging the vestry and organ chamber, the re-roofing of the church, and thirdly, the rebuilding of the tower, and adding a west porch. The present small steeple on the south side will be replaced by a square tower in the centre of the west end of the building.

The Chapel of St. Faith, at the south end of Poets' Corner, in Westminster Abbey, has been fitted up by the Dean and Chapter, and is now set apart for private devotion.



## CONTENTS.

Advisers, Arbitrators, and Taskmasters	263
Local Resources v. Foreign Substitutes	264
Technical Institutes	265
The Society of Architects	267
Notes on Domestic Drainage.—III.	268
Saint-Front of Périgueux, and the Domed Churches of Périgord and La Charente	269
Building News Designing Club	270
St. Anselm's Church, Davies-street, Mayfair	270
The Conditions of Building Contracts	271
Concrete Construction	272
Sanitation and Disposal of Refuse	274
The Building News Directory	1x.
Our Illustrations	275
Royal Academy Exhibition, 1896	275
Building Intelligence	284
Architectural and Archaeological Societies	284
A New Door-Fastener	285
Steel Girders and Joists	285
Inflammable Houses	285
Obituary	286
Competitions	286
Correspondence	287
Intercommunication	287
Legal	288
Legal Intelligence	288
Our Office Table	288
Meetings for the Ensuing Week	289
Trade News	300
Tenders	300

## ILLUSTRATIONS.

PORTRAITS BY HOLBEIN, FROM WINDSOR CASTLE.—NEW BUILDINGS ON THE SITE OF OLD FARRINGTON MARKET.—SAILORS' REST, VIA MILANO, GENOA.—DESIGN FOR A BAND STAND.—"BUILDING NEWS" CLUB DESIGNS FOR A SMALL TOWN CHURCH.—STAIRCASE BALUSTRADES IN CAST IRON.

## Our Illustrations.

## HOLBEIN'S PORTRAITS FROM WINDSOR CASTLE.

MR. FRANZ HANFSTAENGL, with much artistic appreciation and undoubted enterprise, has recently prepared a considerable series of reproductions of some of the masterpieces of painting housed in the galleries of Buckingham Palace and Windsor Castle. Besides these, exquisite photographs thus produced by special permission of the Queen, the same publisher has just issued an exceedingly beautiful volume\* of collotypes, giving exact *facsimiles* of a capital selection from the famous 87 iconic drawings, known as the "Windsor collection," by Hans Holbein, which form the magnificent and incomparable assemblage of original portraits by this great German master of most of the leading personages associated with the Court of Henry VIII. The impressions given in the folio before us are printed in red tones upon hand-made Japanese paper, and a brief historical account by Mr. Richard R. Holmes, F.S.A., the Keeper of the Prints at Windsor, furnishes the text of this admirable book. Photographs have at various times been issued representing to a lesser scale some of these drawings, and, of course, the exquisite mezzotints by Bartolozzi are familiar to the collector and connoisseur. Never hitherto, however, have such reproductions as those before us been published in representation of these transcendent drawings. The choice has been judiciously made, and, where possible, the names of the celebrities delineated are given, though, as a matter of fact, the precise persons in some cases cannot be now really identified. To recount the history of Holbein's unrivalled achievements as a portrait-painter would indeed be a work of supererogation in this place, and the old story of how the designer of painted glass and goldsmiths' work, the once humble engraver on wood, became introduced to the King by the great Chancellor, Sir Thomas More, need not here be again retold, and it will be remembered how it was by the likeness of Anne of Cleves, painted by Holbein, that Henry determined upon his choice of a fourth wife. This unfortunate lady, when she in her turn was cast off by her royal lover, was granted, for life, the estates of Hever Castle, in Kent, which the King seized from its rightful owners on the death of the Earl of Wiltshire, his previous wife's father. Sir Geoffrey Boleyn, mercer and Lord Mayor during the days of Henry VI., began the building of the present castle, and his grandson, whose portrait we reproduce to-day from Mr. Hanfstaengl's book, Sir Thomas Boleyn, completed it. Here it was

that Anne Boleyn was educated under her French "gouvernante," Simonette; and here it was that King Henry made love to her in the island gardens of the castle. Sir Thomas, afterwards Earl of Wiltshire and Ormonde, was also associated with Blickling Hall, and while it has been stated that King Henry visited Aylsham to bring away Anne from her Norfolk home, it is with equal uncertainty asserted that she was born at Hever. The portrait of her father is eminently characteristic of its author, treated with every felicity of expression and grasp of physiognomy, at once delicate in the detail and modelling of the features, as well as dashing sketchy in the unfinished portions of the study. The second portrait, inscribed "Anna Bolleyn, Queen," is of some unknown lady of the Court, and no conjecture is afforded as to her identity. Among those ladies whose likenesses are given in the folio is Queen Jane Seymour, Elizabeth Dancy, daughter of Sir Thomas More, and Cicely Neron her sister, their brother John forming one of the most remarkable portraits of the entire series. His wife, Anne Cresacre, follows, and then "Mother Jak," nurse to Edward VI., wearing a queer headdress and cap. The Lady Surrey, Frances Henry Howard, and Lady Vaux, as well as Catherine, fourth wife of the Duke of Suffolk, are notable examples; but some of the unnamed portraits are distinguished by the best drawings. Foremost among the male characters we would place the masterly head of Sir Henry Guildford, K.G., presenting only the face and cap with no accessories whatever. The simplest methods are employed, but the effect is consummate, and beyond all praise. Sir John Gage has a more refined but weaker face, and as an easy, good-natured character, Sir Richard Southwell's likeness may be named, for it is drawn with exquisite feeling and delicacy. Sir John Godsall is a more finished study, in which the dress is treated with much breadth of handling. Sir Thomas Elyot, at a first glance, recalls the well-known face of Mr. Norman Shaw, R.A., though on second thoughts it is only a passing fancy, and, any way, anyone would be fortunate in having a record in such a portrait. John Colet, the Dean of St. Paul's, and Nicholas Bourbon conclude the series, which is bound in white vellum, strong and in perfectly good taste, making a book to be valued for its beauty and thoroughness, as well as for its intrinsic interest historically.

## THE OLD FARRINGTON MARKET ESTATE.

THE illustration we publish this week shows some of the buildings which have recently been erected on the estate, from plans prepared by, and under the superintendence of, Mr. Percy B. Tubbs, 68, Aldersgate-street, E.C. The new street formed through the centre of the estate from Stonecutter-street to Farringdon-street is shown in the centre of the drawing, and is 40ft. wide. The buildings are faced with Portland stone, the turrets being covered with copper tiles. Each house is thoroughly lighted, and suitable for any trade—especially china and glass—and publishers, who seem to be making the estate their centre. There are altogether forty warehouses.

## SAILORS' REST AT GENOA.

THE Sailors' Rest at Genoa is an old building adapted and added to for the purpose of a seamen's institute. There are recreation and magazine rooms on the ground floor, officers' room and billiard-room on the first floor, lecture-hall and service-rooms on the second floor, and the missionary's residence on the top floor. The dressings externally are of Carrara marble, except the entrance doorway, which is Pavonazza, whilst the cement exterior is coloured a dull slaty green. The main stair generally is of marble, which is little, if any, dearer in Genoa than slate, and freely used for ordinary purposes. Considerable care has been taken to keep the rooms cool in summer by a natural ventilating system. The whole building is heated in winter by low-pressure hot-water pipes. Electric light is also generated on the premises. The plant is of a very ingenious nature and has been fitted up by a Swiss firm; the motive power being got direct from the town water main, a very compact arrangement of turbine and dynamo being fitted together on a small marble table in the ante-hall. It is only necessary to turn the water on when light is required. An automatic arrangement increases or decreases the water pressure as the lights in use are turned off or on. The premises are at the end of the Via Milano, overlooking the

harbour, and the work has been executed by local contractors. The architect is Mr. D. B. Niven, A.R.I.B.A.

## DESIGN FOR A BAND STAND.

THE Grissell Gold Medal for this year is awarded for a Band Stand, to be constructed in wood and iron, internal diameter 30ft., platform to be raised not less than 4ft. from the ground. The plan is decangular in shape, with cast-iron buttress at either corner. Cast iron of a decorative character has been chosen for the main structure exposed to the weather, the dome and platform timber of fir, platform of oak, and ceiling of coloured hard-woods (see section). A sweeter soundboard is thus formed by building the dome of wood instead of iron construction. The roof of dome is covered with 26oz. sheet copper, with welter rolls (carried over eaves to form sun-blinds), and secured by copper nails. The water is carried off from gutter in 3in. internal diameter cast-iron fall-pipe, fixed inside columns and discharging on gully at base. Coverings have been made in the form of light, rolling steel shutters (in box under platform) to entirely close up the stand when not in use. The platform is caulked similar to a ship's deck, and falls all ways to small channel, which empties by 2in. lead pipes on to gullies under columns. Special arrangements have been made to secure comfortable seats around the stand, the steps keeping off the promenaders. Electric lighting is introduced around the frieze and in the lantern. Ample ventilation is made to platform and dome timbers. The decorative ironwork to be painted a royal blue, the enrichment picked out with gold. The copper will naturally turn a fine brilliant green, and the lantern to be painted ivory white.

## "BUILDING NEWS" DESIGNING CLUB: A SMALL TOWN CHURCH.

(See description on p. 270.)

## STAIRCASE BALUSTRADES IN CAST IRON.

THE three examples of newels and balusters, of which sketches are given on another page, have recently been cast by the Coalbrookdale Co., who, in response to the constant demand for fresh designs, as constantly seek to supply it in all branches of cast-metal work. A feature with this company has ever been to employ good men to assist them in bringing before the public designs of a superior kind. They have now on view at their showroom some effective productions in balustrades, three examples of which we have shown on our sheet of sketches. The first two on the drawing were designed by Mr. Maurice B. Adams, F.R.I.B.A., architect, the third being by Mr. R. J. Haines, of Oxford.

\* \* Readers will notice that we appear this week in new type throughout. In resetting the entire paper, it occasionally happens, in spite of all care, that errors will creep into advertisements, directory notices, &c. Will advertisers point out any such, if they have escaped us, and they shall be at once corrected.

## ROYAL ACADEMY EXHIBITION, 1896.

THE days appointed for receiving architectural drawings and pictures at Burlington House this spring are fixed for March 27, 28, and 30, and for sculpture March 31. We shall be happy to be favoured, as in former years, by the loan of drawings, intended for this exhibition, to be photographed before they are sent in, so that reproductions may be prepared ready to be illustrated after the opening of the galleries in May. It may be a convenience to some of our contributors to know that when drawings are thus lent to us we shall be pleased to deliver their works to the Academy in good time for the exhibition, free of all charge. It will be an advantage if such drawings can be forwarded as early as possible. Washed views take longer to reproduce than line or pen-and-ink drawings.

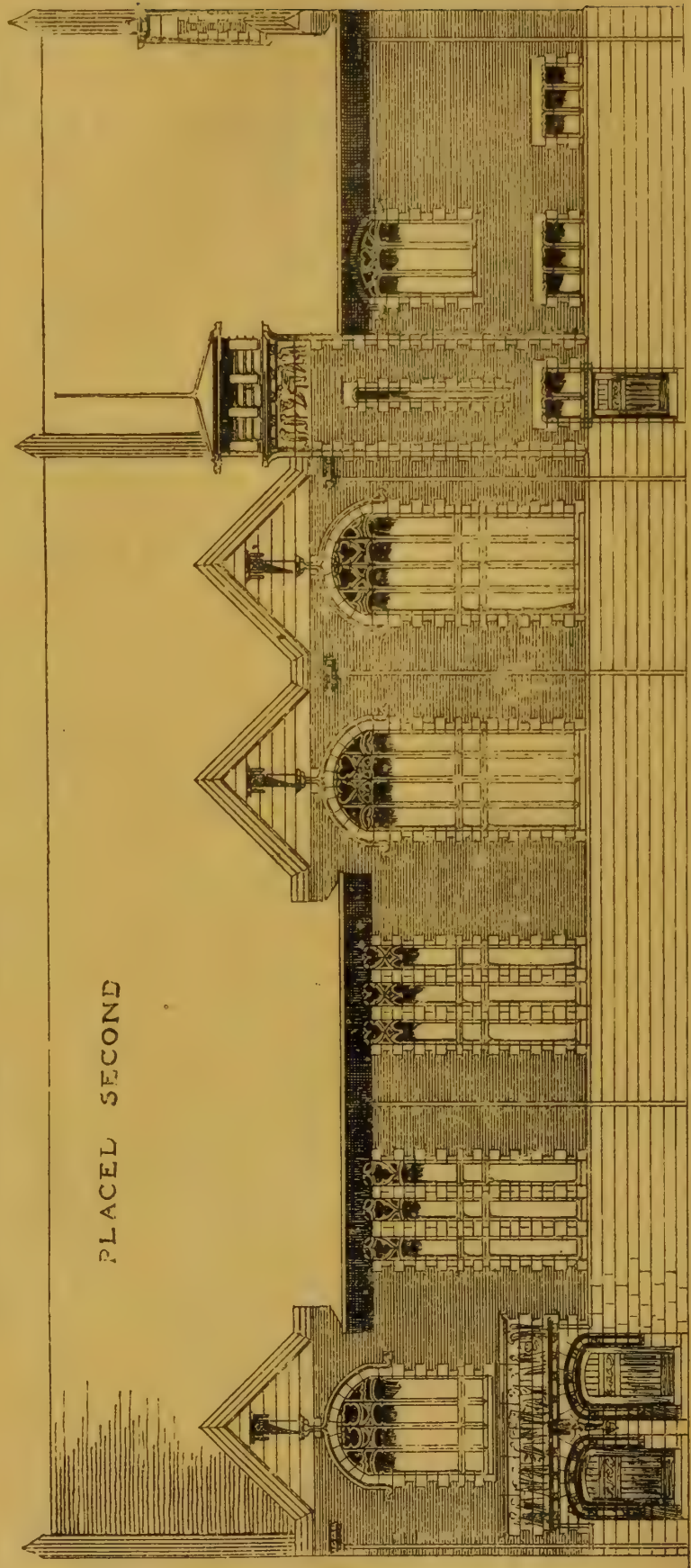
The monthly report just issued by the Labour Department states that the building trade, as a whole, continues steadily employed. The percentage of unemployed in unions making returns for January is 3.7 compared with 3.8 last month, and 8.2 in January, 1895, when the long frost was in progress. The furnishing and wood-working trades remain steady. The percentage of unemployed in unions making returns is 1.2 compared with 4.4 in December, and 6.7 in January, 1895.

\* Portraits of Illustrious Personages of the Court of Henry VIII., reproduced in imitation of the original drawings of Hans Holbein in the collection of Her Majesty. London: Franz Hanfstaengl, 16, Pall Mall, S.W.



B.N.D.C. : A SMALL TOWN CHURCH : BY THE OVL :

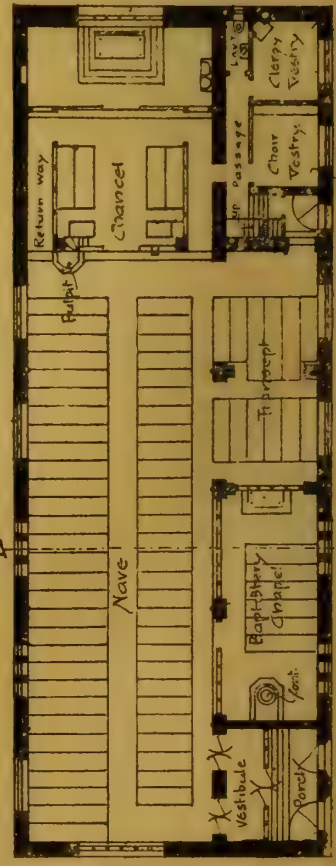
PLACED SECOND



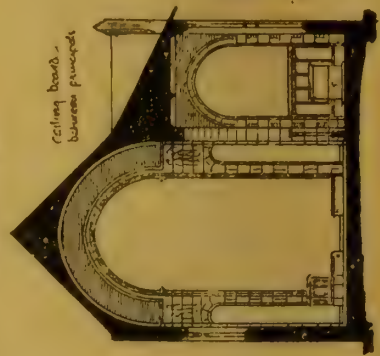
SOUTH ELEVATION

SCALE FOR ELEVATION: 1/8" = 1' 0"  
PLAN ETC. 1/4" = 1' 0"

Accommodation:	
Nave	292
Transept	66
Chapel	36
Choir	22
Total	416



PLAN :



SECTION AB :

VIEW

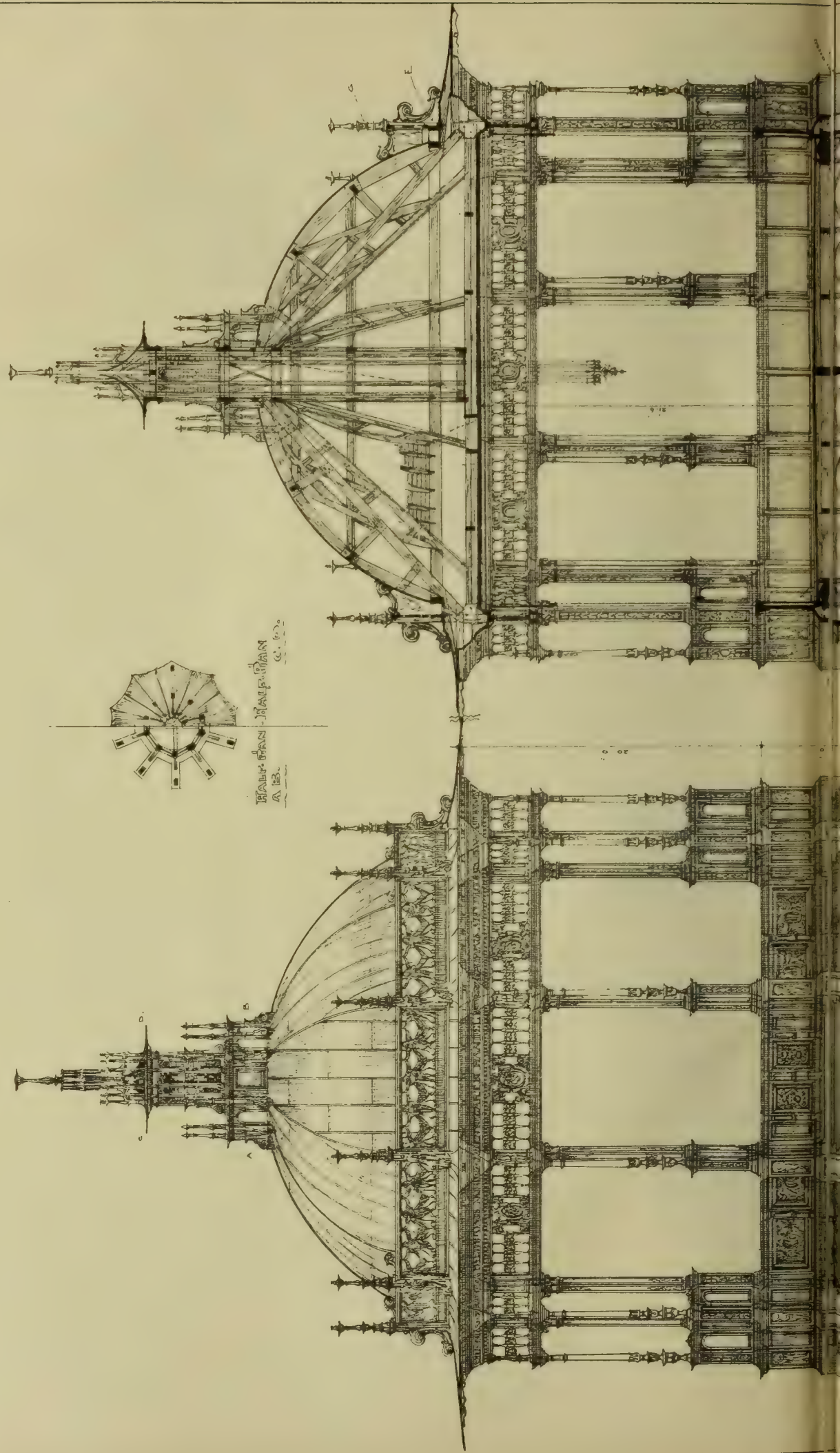








DESIGN FOR A BAND-STAND:  
CONSTRUCTED OF WOOD AND IRON.





ELEVATIONS OF THE TEMPLE  
Dotted.

Lines showing foundations.

Roof with rafters  
Dotted, attached.

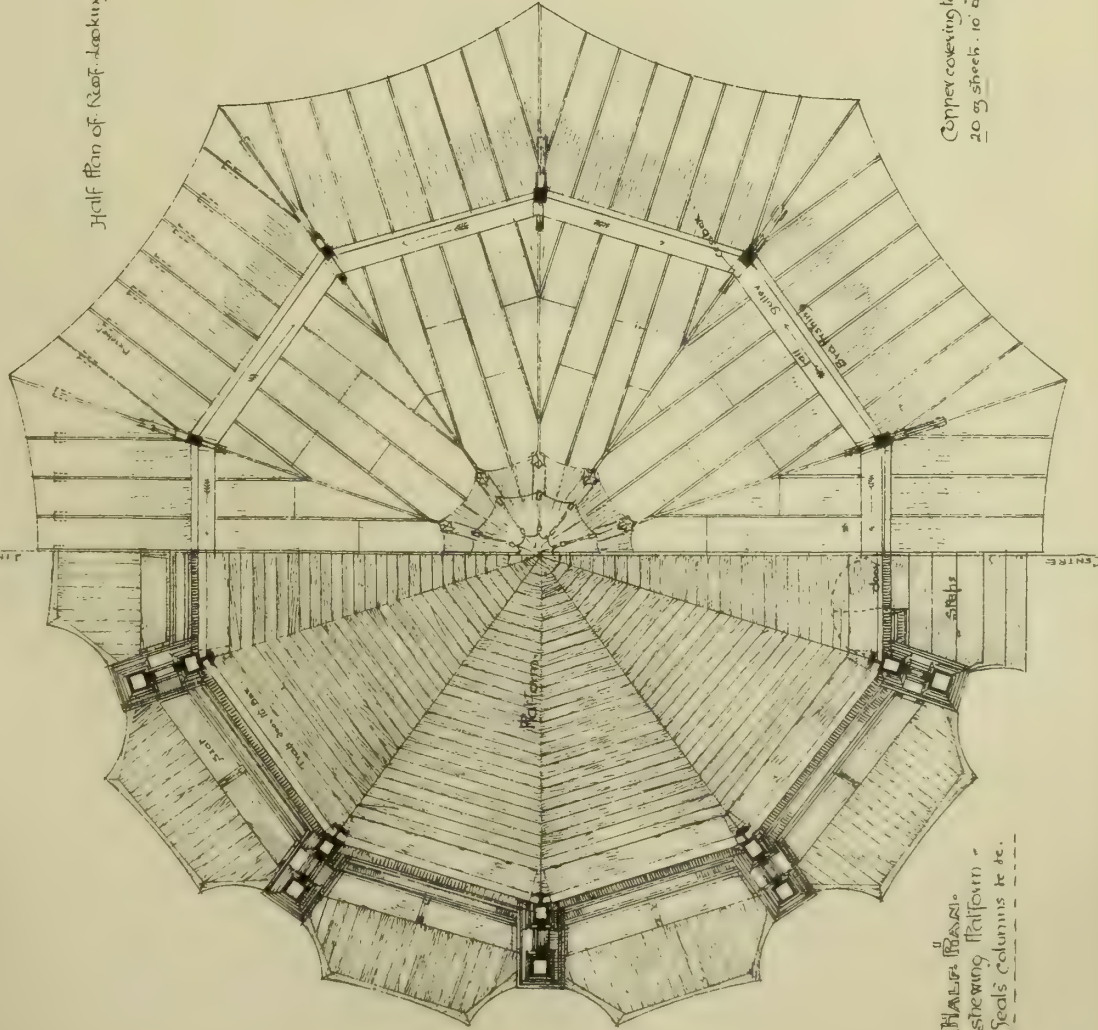
Fig. SECTION

through A. B. See dotted lines on plan.

For dimensions of timbers  
See 3/4 Scale section.  
Shedding for seals under flat form.

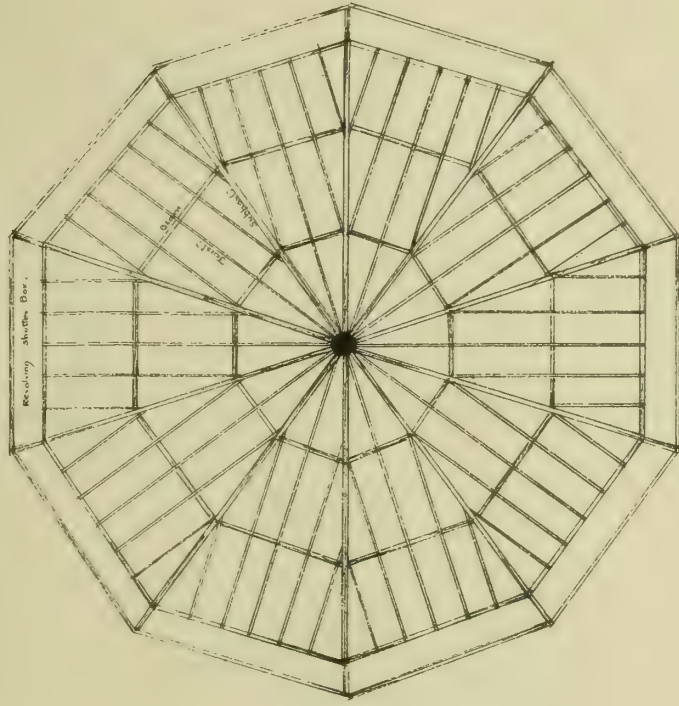


Half Plan of Roof looking down:



Half Plan  
showing flat form -  
Seals columns &c.

Copper covering to roof.  
20 sq sheets 10' along



For details of construction  
see 3/4 Scale section.  
Shedding for seals under flat form.











Ormond





FEB. 21, 1896.

HOLBEIN'S PORTRAITS FROM WINDSOR CASTLE.

SIR THOMAS BOLEYN & AN UNKNOWN LADY.

Anna Bollein Queen.













New Buildings,  
now erected on the site  
of the old  
Farringdon Market.  
Percy B. Tubbs,  
Architect and Surveyor,  
68 Aldersgate St. E.C.





FEB. 21, 1896.

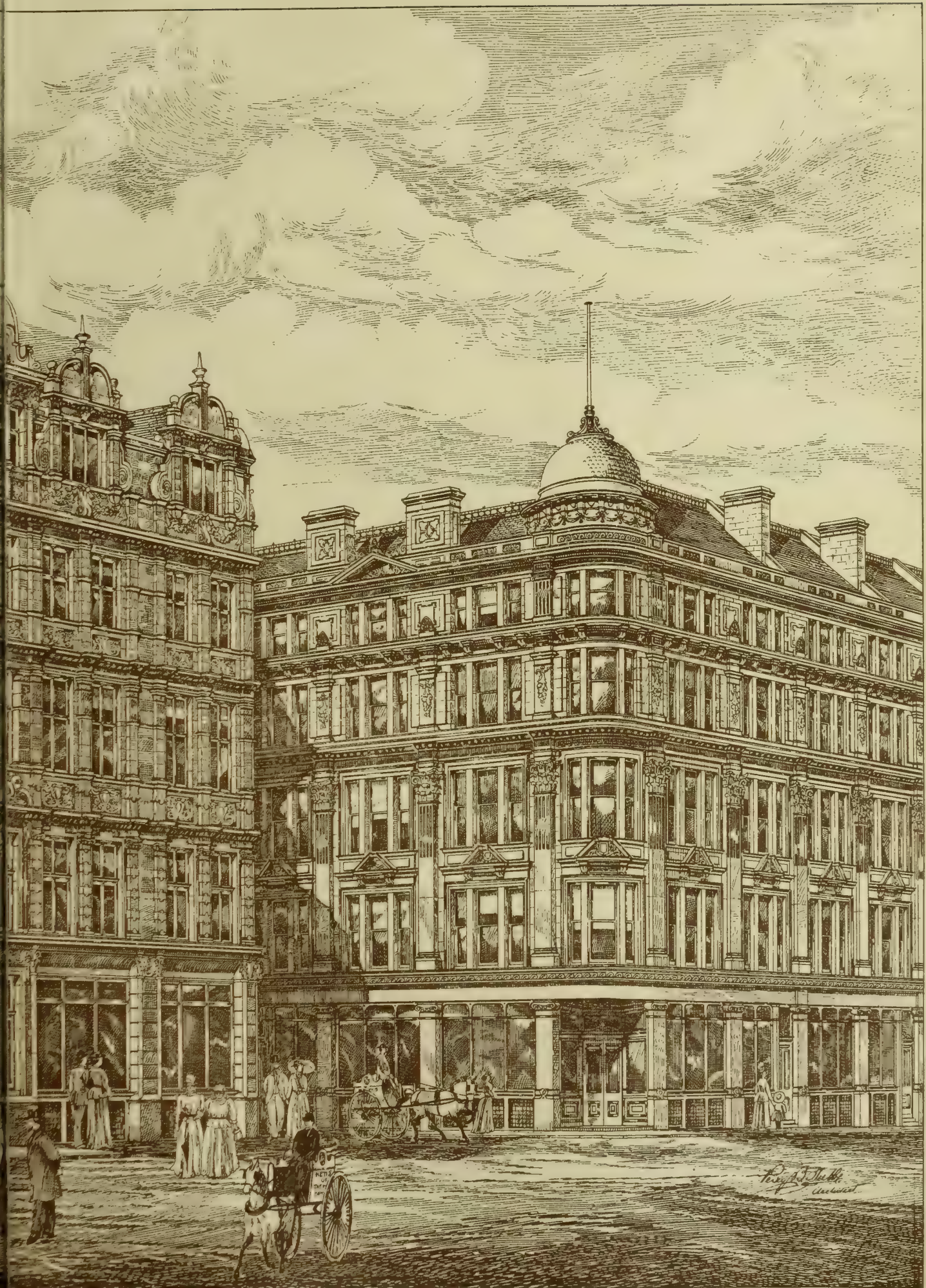


Photo Lithographed & Printed by James Axeman. 6 Queen Square, W.C.











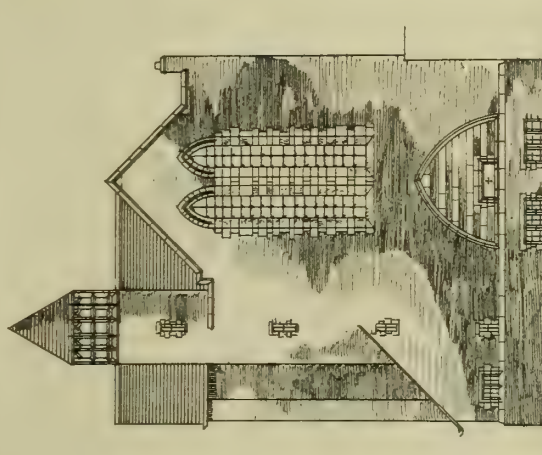


Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.





South Elevations

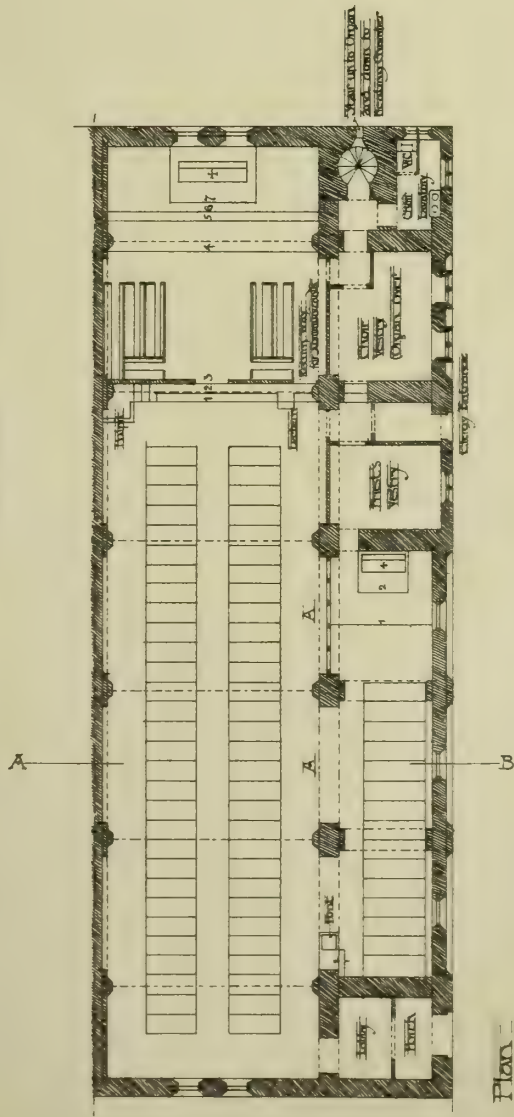


Fast Elevation

"Building News" Designing Club  
January 1896  
A Small Town Church  
by "Hysteria"

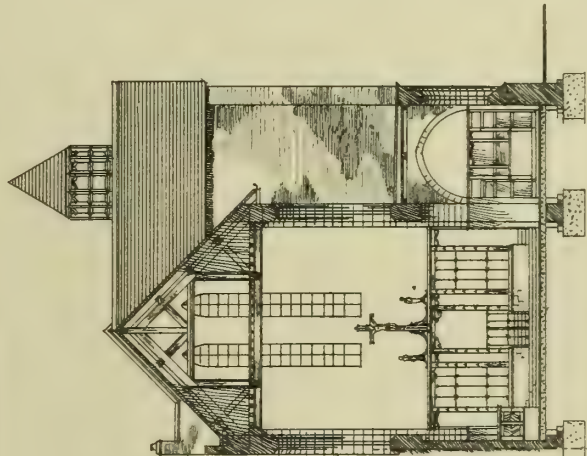
Accommodation	
Nave (5 in each seat)	300
Chapel (6 in each seat)	90
Chancel	4
Clergy	27
Choir	41
Total	462

# PLACED FIRST

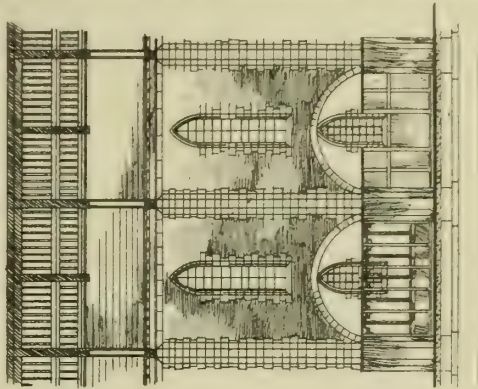


# Plan

Scale of



Section A.B.



Elevation of two Bays  
of Nave: AA on plan

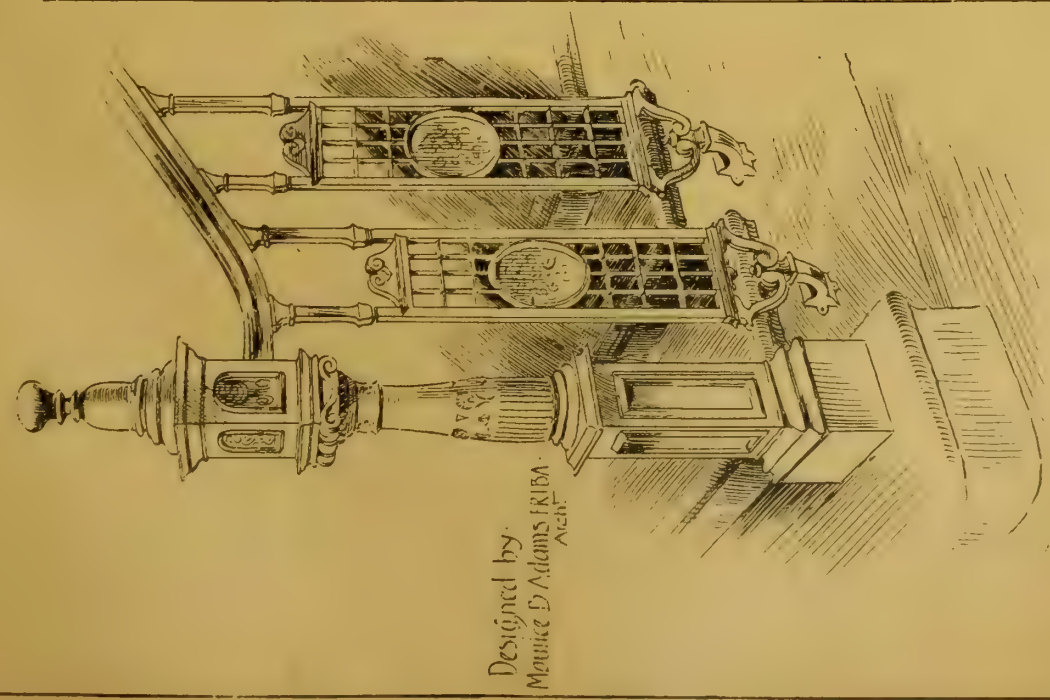




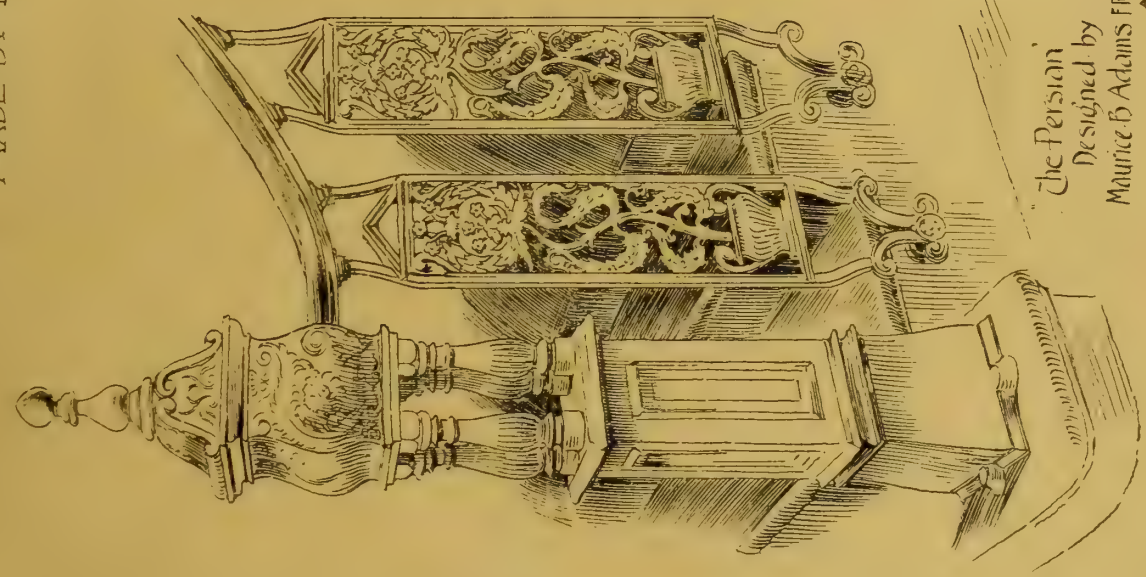


STAIRCASE BALUSTRADES  
IN CAST-IRON.

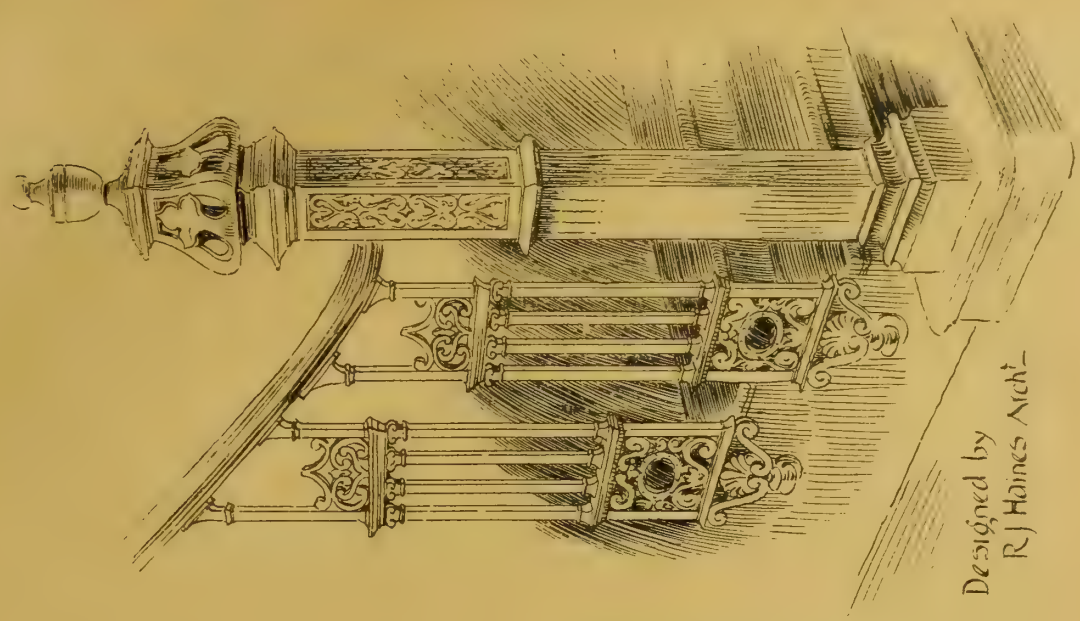
MADE BY THE CALBROOKDALE COY.



Designed by  
Maurice B Adams FRIBA  
Arch<sup>t</sup>



The Persian  
Designed by  
Maurice B Adams FRIBA  
Arch<sup>t</sup>



Designed by  
R J Haines Arch<sup>t</sup>



## Building Intelligence.

**BOLDMERE.**—The dedication service on the completion of a south aisle, south chancel aisle, choir and clergy vestries at St. Michael's Church took place on Friday. The enlargement of the church is carried out on the lines of the original plan. The new aisle is 60ft. long by 19ft. wide, corresponding in size with the north aisle. The chancel aisle is about 19ft. by 22ft. A great improvement is made by enlarging the organ chamber, which provides a good choir vestry at the back; and there is a clergy vestry, the want of which has been much felt. The floor of the new portion is boarded, and the passages laid with red Ruabon tiles. The reredos has panels of glass mosaic. The extra accommodation will be about 200. To complete the work a south porch is to be erected. The work has been carried out by Messrs. Collins and Godfrey, builders, Tewkesbury, from plans and under the superintendence of Mr. J. A. Chatwin, architect, of Birmingham.

**CANTERBURY.**—A design for the Payne-Smith memorial pulpit in the nave of Canterbury Cathedral has been furnished by Mr. G. F. Bodley, A.R.A., and has been approved of by the committee. On the steps leading up to it will be figures of the four sainted Archbishops—St. Augustine, St. Alphege, St. Edmund, and St. Anselm. The scheme for lending colour to the nave of the cathedral and improving its acoustic properties is also progressing. Besides two given by himself, Dean Farrar has received promises of banners from twelve donors. The banners are to be hung at right angles to the pillars in a similar manner to those in the choir at St. George's Chapel, Windsor, and in the Henry VII. chapel at Westminster Abbey.

**FRIZINGHALL.**—A new church, dedicated to St. John, is in course of completion at Frizinghall, near Heaton, a suburb of Bradford. At present only the nave and aisles are being erected, the chancel, south-west tower, and spire being left till additional funds are forthcoming. The style adopted is Decorated Gothic, carried out in local stone. The architects are Messrs. H. and E. Martin, of Bradford.

**HEREFORD.**—The Bishop, Dr. Percival, laid, on Saturday, the corner-stone of the new Cathedral Library. This building is being erected by means of a legacy of £4,000. Sir A. W. Blomfield, A.R.A., the architect, is carrying out the design in accordance with the east and south cloister of the close. There will be, when finished, three new bays of cloister at the west side of the cathedral close, with a room over the bays 14ft. by 16½ft. In this room will be placed the library, whilst the cloisters beneath will be utilised for a modern library and reading-room. A movement is also on foot to restore two of the bays at the west end of the old south cloister, so as to unite them with the new south cloister which is to form the library.

**HOLBECK, LEEDS.**—The new Roman Catholic Church of St. Francis of Assisi, Holbeck, was opened on Thursday in last week. The church is in style Early English. The plan comprises a nave with sanctuary, 133ft. long by 21ft. wide, between the walls, the north and south aisles being 14ft. wide and 106ft. long. At the east end of the north and south aisles are chapels, and at the west end of the north aisle is a baptistery. At the west end of the south aisle is a tower, having a wide stone staircase leading to a gallery having space for organ and choir. There is a peal of eight bells, cast by Mr. Byrne, of Dublin. Parallel with the north aisle is a corridor communicating with the presbytery, and recessed arched openings into a chapel and two confessionals. The height of the nave is 55ft. from the floor line. The church is constructed of brick, with stone dressings, and the roofs are covered with green Welsh slates. The heating is by hot water. The church will seat 700 adults, and the cost has been £4,100. The architect was Mr. John Kelly, of Leeds and London.

**SUNDERLAND.**—New board schools have been built in Hudson-road at a cost of £8,800, and comprise two principal blocks, one in three stories for boys and girls, and a one-story building for infants. There is also a caretaker's house. The infants' school is carried out on the same style as the senior school, and accommodates 300 infants. The schools are planned on the corridor system, with cross ventilation and left-hand light to all

classrooms. The senior school accommodates 300 boys on the ground floor, and 300 girls on the first floor. There is also on the first floor a cookery room, disconnected from the main block by an open lobby. The schools are warmed by ventilating stoves with open fires. There are also other ventilating inlets in the outer walls, and a system of trunk extraction terminating in a louvred exit above roof line. The schools have been built by Mr. Geo. H. Hodgson, of Sunderland, from designs by Mr. Geo. T. Brown, of Sunderland, selected in competition.

### CHIPS.

An assembly-hall which has been added to the Royal Oak Hotel, at Ledbury, was formally opened last week. Mr. Godsell, of Hereford, was the architect, and Mr. George Hill, of Ledbury, the builder.

Colonel Luard, C.E., one of the inspectors of the Local Government Board, held an inquiry on Friday in the District Council Offices, Stretford, with regard to an application by the district council for power to borrow £6,750 for purposes of sewage disposal. It is proposed to purchase 37 acres of land for the purpose of extending the sewage farm, which at present contains 40 acres of land.

The Torquay Town Council have decided to apply for leave to borrow £22,300 for lighting the borough with electricity.

Colonel J. T. Marsh, R.E., Local Government Inspector, held an inquiry at Mytholmroyd, on Friday, with respect to an application for powers to borrow £1,200 and £190, for water supply and public lighting respectively. The first-named amount is to cover the cost of purchasing water mains laid in their district by the Urban Council of Hebden Bridge prior to the creation of the Mytholmroyd authority, and for the purposes of extension; and the £190 is needed to cover cost of lighting the public roads from Mytholmroyd to Cragg Vale and Brearley.

Mr. George W. Pope, who has been for many years well known in and about Boston, Mass., as a builder, and, in connection with his son, as the architect of a large number of business and other buildings, died last week in Boston, aged 74 years.

An important addition has been made to St. Mary's Home, Wantage, in the opening of a large infirmary wing for Sisters in failing health, which has been built from the plans of Mr. A. Mardon Mowbray, of Oxford. The new wing is three stories in height, and contains 36 new rooms, including a kitchen, Sisters' day and sleeping rooms, surgery and dispensary, and bath-rooms.

St. Peter's Church, at Eastbourne, has just been consecrated. It consists of lofty nave and chancel, each 30ft. in span, divided only by a roof-beam, with aisles also of great height. The building is Early English in style, and is carried out in stone and brick. The cost has been £16,000.

According to the *World*, extensive alterations and improvements are to be carried out by the Queen in Whippingham Church. The windows are to be filled with stained glass, and the Osborne household pew is to be converted into a memorial chapel. Prince Henry's tomb is to be most elaborately decorated, and part of the work will be designed by Princess Louise. The tomb is to be covered with a recumbent statue of the late Prince, similar to the one of the lamented Prince Consort in the Albert Memorial Chapel at Windsor.

The Ipswich corporation accepted at their last meeting an oil painting by the late C. Elder, entitled "The Death of Mark Antony," and exhibited at the Royal Academy in 1847. The picture will be hung with others previously given in the old Christchurch Mansion.

The work of fencing the boundary for the Keyham Dockyard extension has been commenced, and during next week one-half of the ground formerly appropriated to the Royal Naval Barracks will be fenced off. The gun battery erected for drill purposes is to be demolished, and it is proposed to erect another at the north end of the barracks. It will be necessary also to demolish the Naval Barracks signalling station and the Royal Naval Barracks pier.

New board schools have just been completed and opened at Kington, Herefordshire. Mr. J. E. Goodacre is the architect.

New infants' schools have just been built for the school board for Elin, near Southampton, at a cost of £2,200. Messrs. Mitchell, Son, and Gutteridge, of Southampton, were the architects, and Mr. Jakes, of the same town, was the builder.

A new Roman Catholic Church of St. Peter was opened at Ashcroft, Cirencester, on Thursday in last week. It is Early English in style, and cost £1,200. The Rev. Canon Scoles, of Yeovil, was the architect.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**BIRMINGHAM ARCHITECTURAL ASSOCIATION.**—The eighth general meeting of the session was held on Friday evening last, when Mr. Arthur Dixon, M.A., read a paper on the subject of "Ancient and Modern Building." Mr. Dixon said he believed, however, that the principal difficulty of modern times lay in the change of system under which building is carried on. In the old days, architect, builder, mason, and carpenter worked in intimate, and more or less permanent, relationship. Consequently, every workman took an intelligent and personal interest in the work upon which he was engaged, and every stone and every piece of timber, as well as the general form and shape of the building, was full of life and interest. Nowadays, a workman is continually changing his master and his style; he loses his own personality, and becomes little more than an admirable, but soulless, machine. In conclusion, the lecturer suggested that the only way to regain the beauty and interest of ancient building is to find some means by which the barriers between designers or architects, builders and craftsmen may be broken down, and by which a larger scope may be allowed to the feeling and intelligence of the latter.

**DUBLIN MASTER BUILDERS' ASSOCIATION.**—The annual meeting of this association was held this week in the Grosvenor Hotel, Westland-row, Dublin; the Right Hon. Alderman Meade, LL.D., presiding, in the chair. There was a large attendance of members. The following officers were elected for 1896:—President, Right Hon. Joseph Michael Meade, LL.D., J.P., Alderman of the City of Dublin; Hon. Secretary, John Wood, 55, Gt. Brunswick-street; Hon. Treasurer, James Kiernan; Committee, Thomas Mackey, Alderman Toole, James Conolly, James Beckett, Samuel Bolton, J.P., James Martin, R. F. Lidwell, J.P., James P. Pile, Henry Sharpe, J.P.

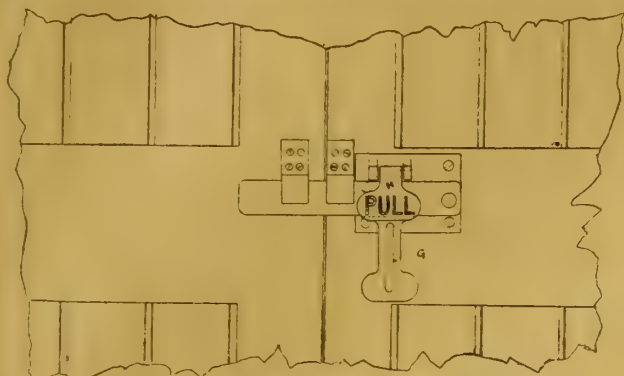
**EDINBURGH ARCHITECTURAL ASSOCIATION.**—About seventy members of the Association, under the leadership of Dr. Rowand Anderson, president, and Mr. T. Fairbairn, secretary, on Saturday took part in one of the usual fortnightly excursions. The first place visited was the Electric Lighting Station, Dewar-place, by permission of the Lord Provost and Magistrates. The party were received by Mr. C. W. Monkhouse, C.E., who conducted them through the building and explained the plant and machinery. Dr. Anderson, in moving a vote of thanks to Mr. Monkhouse, expressed the general wish that success would attend that gentleman in London when he transferred his services thither, which he intended doing early in April. The party having inspected the premises in which the electric light was produced, next proceeded to view its applications in the mansions, Nos. 11 and 28, Drumsheugh-gardens. The wiring and fittings in both houses were designed and superintended by Professor Forbes, of London.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—A meeting was held in the Rooms, 187, Pitt-street, on Tuesday evening, when a lecture was delivered by Mr. T. L. Watson, F.R.I.B.A., President Institute of Architects, subject, "Glasgow Cathedral: a Contribution to the History of the Structure." He said it was not inferior in beauty to any Continental cathedral, the vigour of its choir being among the most delightful of the Middle Ages. Entering into an historical review of the building, he described in detail the various mouldings, plans, &c., and also the method likely to have been employed in building the structure. The vaulting of the crypt, he said, was its chief glory, and he gave an elaborate description of the plan adopted and the difficulties overcome. The lecture was illustrated by diagrams, and also lantern slides. Mr. John Honeyman, an authority on the subject, speaking after, agreed generally with the conclusions arrived at by Mr. Watson, and at the close a hearty vote of thanks was passed by a large audience.

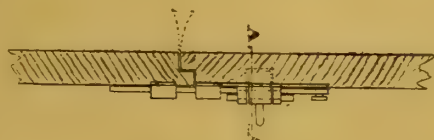
At Oxford University, on Monday, the degree of M.A. was conferred by decree of Convocation on Mr. William Henry Stevenson, the eminent authority on early Mediæval records, who has lately been elected a Fellow of Exeter College.

Mr. A. C. Poole, late articled pupil and assistant with Mr. J. Siddals, borough surveyor, Tiverton, was, on Monday, out of forty applicants, selected as assistant surveyor of Rotherham, Yorkshire.





Elevation inside of Doors



Plan

Section A-A

## A NEW DOOR-FASTENER.

THE sketch is a new fastener for doors, being especially applicable to theatres and public halls. The contrivance is exceedingly simple, and consists of a steel bar hung on a bolt, engaging with two open-ended staples in the case of double doors, and with one staple and a slot cut in the door-frame in the case of a single door. The bar is kept in a horizontal position between the staples by a holder, H, such holder being also the means of liberating the bar when necessary.

When it is desired to fasten the doors, they are shut tight by pulling the handle G, fixing the bar in position between the staples, and allowing the holder to fall to its normal position. A stop being formed on the inside of the holder keeps the bar fixed. By pulling the handle the bar is forced free of the staples by a cam (also part of the holder); consequently the bar at once falls to a vertical position by its own weight, leaving the doors unfastened. The principal advantages claimed for the invention are, that it meets a long-felt difficulty in securely fastening doors by the same means that allow a panic-stricken crowd to easily open such doors; it can be manufactured very cheaply because of its simplicity; and that it cannot get out of order owing to its few working parts. The inventor and patentee is Mr. W. J. Steele, the assistant borough engineer of West Hartlepool.

## STEEL GIRDERS AND JOISTS.\*

A VERY convenient and useful little book on "Steel Sections" manufactured by Messrs. Dorman, Long, and Co., of Middlesbrough, has been brought out by this firm for the use of architects, engineers, and builders. We lately noticed the value of this publication, which gives, in a tabulated form, the weights, sizes, moments of resistance and inertia, and loads that one foot will carry of all joists. The steel is manufactured by the Siemens-Martin open hearth acid process, and is generally recognised as of high-class quality, and the tests guaranteed are 28 to 32 tons per square inch tensile strain, and 20 per cent. elongation in a length of 8 in. The sections of angles, channels, stanchions, I-joists, compound box and plate girders are illustrated in each table, so that reference is easily made, to each section is marked the weight per foot, the span and tons or distributed loads. The tables appended to each girder section also give the weight per foot, dimensions of web and flanges, square inches, moments of resistance, distributed load in tons that one foot will carry under their different factors of safety. For a joist for carrying a permanent dead load, the strain is calculated at 10·6 tons per square inch, or a third of breaking strain; for live loads, 6·4 tons per square inch, or one-fifth of breaking strain. This handbook will be found of more practical value than many theoretical treatises, and all the sections kept in stock are distinguished.

\* London: McCorquodale and Co., Ltd., Cardington-street, N.W.

## INFLAMMABLE HOUSES.

WE still live under conditions of insecurity amidst the many complexities of advanced civilisation. When statutory legislation has done so much to insure security against accidents arising from bad building and from fire, it seems almost paradoxical to hear of sudden collapses of houses and appalling fires like that which occurred on Sunday in Church-street, Soho. We naturally inquire how it happens that in a locality lately reconstructed in part, houses should still remain which are veritable death-traps. A very large percentage of the old and new buildings in London are of practically timber construction internally. The houses on the west side of Drury-lane lately demolished were of this kind, as may be seen by the partially-exposed houses; but the older buildings are not worse than the ordinary rows of suburban houses that are now built. The London Building Act, with all its useful provisions for the construction of external and party walls, leaves the owner or builder to do what he likes with the interior. Floors and partitions, staircase and landings and roof, are permitted to be constructed of the lightest timbering. The lower walls, it is true, may be brick-nogged between the studding; but the staircase and spandrel may be of the flimsiest deal and matched-board. Practically, therefore, the only communicable part of the structure, and the one portion that is most useful for escape, is the most unprotected and inflammable. Building regulations of the most complete kind are put into force for all large warehouses and residential blocks of flats. Every building of more than 125,000c.ft. built as a dwelling-house for separate families is to have the floors of the lobbies, corridors, and landings and the stairs of "fire-resisting" material, and under the new Act provision is made for buildings in separate tenements for more than two families that the staircase used in common is to be ventilated by windows or skylights on every story. Yet there is no provision for ordinary dwellings that can be let to separate families, the majority of which are far below the cubical extent specified. Until the law applies the rule to every dwelling as regards, at least, the staircase and landing, we shall still have to endure the shock of so distressing a scene as that witnessed on Saturday night. The house then gutted was of three stories, of the ordinary construction. The only statutory provision that at all approaches the requirements is that which came into operation last year. A building exceeding 10 squares in area, partly used for trade or manufacture and partly as a dwelling-house, is to have walls and floors of fire-resisting materials separating the two portions thus specified. But this section only applies to buildings of a composite character, and does not touch the ordinary dwelling.

There are many patented and other methods of flooring and rendering construction fire-resisting. There are several admirable kinds of fireproof lathing, like the "Jhilmil" metal lath, which can be applied to protect ceilings,

wooden beams, and partitions. Why should not every house builder be required to use some sort of protecting covering like these? The extra cost would be very trifling. But the framers of Building Acts, as a rule, carefully eschew these inventions, like they did concrete building, and the consequence is that new holocausts for human victims are continually being formed. These calamities need not be. If there was a law to prevent owners or lessors letting out their houses to separate families unless the premises were provided with proper means of escape, and the ceiling rendered unflammable, the danger would be much lessened. But there is nothing of the sort. Any tenant can, unless prevented by special agreement, sublet his house, which may be of the most rotten and inflammable character, to all kinds of persons, many of them of negligent and careless habits, and put in the direct jeopardy the hapless occupants, who, in fancied security, retire for the night in the upper stories, and who not infrequently find their only means of escape cut off, and any exit by the roof impracticable. The one and only recourse is the window, a generally fatal alternative. Three safety appliances, either of which would be useful in saving life, ought, if possible, to be made a condition of letting out in separate apartments any house. These are metal or rope ladders, fixed or easily attachable to the underside of the windows of all upper stories—if the latter, they could be thrown out at a moment's warning—balconies fixed to each of the upper stories, which would afford a means of temporary retreat from the fire and smoke, or trap-doors to the roof with ladder access. If one or other of these inexpensive appliances were to be made compulsory the loss of life would be considerably minimised, and we should not hear of the heart-rending futile efforts made to escape from so relentless a foe.

## CHIPS.

The Putney School of Art has been fortunate in securing the services of Mr. G. W. Rhead as design master. Mr. Rhead has executed important decorative work both in London, Manchester, Edinburgh, Bristol, and Birmingham. Mr. E. W. Ascough, who has been appointed second master of the school, was formerly modelling master to the Metropolitan School of Art, Dublin.

Mr. E. W. Ives, C.E., of Derby, has been instructed to prepare schemes of sewerage and sewage disposal for the parishes Coningsby and Tattershall, Lincoln.

Under Mr. N. J. Hale, architect, the Sheffield School Board have just completed their new schools at Bole Hill. The whole of the wood-block flooring for these schools has been laid by Roger Lowe, of Farnworth, Bolton.

Information has been received by the Department of Science and Art, through the Foreign Office, from the Austro-Hungarian Ambassador at the Court of St. James's, announcing that a National Exhibition, under the patronage of His Imperial and Royal Apostolic Majesty, will be held at Buda-Pest this year, which will be coincident with the 1,000th anniversary of Hungary. The exhibition will be opened on May 2nd next, and will be of considerable interest to foreign countries.

The Workington Town Council have decided to purchase Lord Lonsdale's dock and harbour estate at Workington, for £100,000. The purchase will include the present Lonsdale Dock and harbours, about 26 acres of land, and all the machinery and plant. When the corporation becomes the owner of the dock, &c., considerable alterations will be proceeded with at once, including the deepening and widening of the entrance to the port and the extension of piers. The total contemplated expenditure is about £300,000.

The removal of an old house to the north of the Dutch church in Austinfriars, City, has resulted in allocating the position of the cloister formerly existing at the Augustinian priory there. The existing Dutch church represents the nave of the priory church, the choir, transepts, and steeple of which were destroyed at the beginning of the 17th century. The excavations have revealed a wall attached to a 14th-century archway, already known to exist in the wall of the now demolished house. Several stone bosses, once forming part of a series of groined vaults, have also been recovered, all doubtless portions of the priory cloister. This was at least 70ft. long by 40ft. wide. Part of the present Austinfriars-square occupies the site.

The Clayton and Keymer new schools, Sussex, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.



## OBITUARY.

MR. JOHN HENRY LE KEUX, well known at the time of the Gothic Revival as an engraver on steel of architectural subjects, and also as a water-colour artist, died on the 4th inst. in his 84th year. His father, John le Keux (1783-1848), was the eldest of a family of renown as landscape and architectural engravers. John Henry le Keux, after completing his pupillage with the third generation of James Basire, went into his father's workshop, adopted his manner, and produced a great number of plates for Mr. Ruskin's "Modern Painters," "Stones of Venice," Parker and Billings's architectural publications, Heath's "Annals," besides 31 large examples executed for the Norwegian Government representing Trondhjem Cathedral. His first contribution to a London exhibition were "The Crypt at Gerard's Hall" and "Anglo-Norman Doorway, Harmondsworth Church," which were hung at the Academy in 1853. He was accustomed to engrave after his own drawings, and wrote many papers on Mediaeval armour and weapons. About 30 years ago Mr. le Keux removed to Durham, where he became manager to the publishing and bookselling firm of Andrews.

GENERAL JAMES THOMAS WALKER, R.E., C.B.E., F.R.S., LL.D., who died on Sunday, aged 70 years, rendered excellent service to the Indian Empire in connection with the Trigonometrical Survey. He entered the Bombay Engineer Corps in 1844. His first important work was the military reconnaissance of the Trans-Indus frontier from Peshawar to Dera Ismail Khan, on which he was engaged from 1849 to 1852. He then joined the Great Trigonometrical Survey, and, except during the Mutinies, when he saw active service, and was seriously wounded at Delhi, he was incessantly employed on work connected with it, under Sir Andrew Waugh, until he succeeded that officer as superintendent in 1861. He held this post for 22 years, combining with it during the last five years the surveyor-generalship, and the charge of the Revenue Surveys with no additional pay. He continued and completed the original scheme of the Great Trigonometrical Survey of India, and brought out the nine quarto volumes containing the history of the survey. The final harmonising of results necessitated the most elaborate calculations that have ever been undertaken for the reduction of triangulation. He also investigated the projection and scale of the atlas sheets, and arranged for their publication. General Walker was also in the first rank as a geographer. While he was superintendent he always organised a surveying party for every military expedition, despatched native surveyors to Tibet and Central Asia, harmonised the results of their work, and published numerous maps of great value. On retiring from India in 1883, General Walker became an active member of the council of the Royal Geographical Society, and was the highest authority on all questions relating to Central Asia. For his remarkable and unequalled services as Superintendent of the Great Trigonometrical Survey and Surveyor-General of India he received no honorary recognition whatever from the Government.

MR. WILLIAM JOHN BIRD CLERKE, C.I.E., M.I.C.E., who at the time of his death was an inspecting engineer under the Local Government Board, died on Thursday in last week, aged 58 years, from a throat affection. After some years' work at his profession in Ireland, he joined the Public Works Department under the Government of Bombay, and was employed for many years as an executive engineer in the irrigation department. In the great famine of 1876-7 the engineers had to find employment for large masses of unskilled and inexperienced workmen, and many large irrigation works of permanent utility were planned and completed by Mr. Clerke in the Poona district. When the Bombay municipality settled the question of the water supply of the city by the construction of the huge reservoir known as the Tansa Lake, Mr. Clerke was appointed to carry out the work. The lake was formally inaugurated by the Viceroy of India in April, 1892, Mr. Clerke being created C.I.E. in recognition of his services. Mr. Clerke then closed his career in the East, and entered the service of the Local Government Board, for whom he conducted many local inquiries into applications from local authorities for sanction to contract loans for improvements. Mr. Clerke had been a member of the Institution of Civil Engineers since May, 1871, and had read before

that body many papers, for two of which he was awarded by the council the Telford medal and the Telford premium.

MR. A. PAGE BROWN, a rising architect in practice at San Francisco, has died from injuries received by being thrown from a carriage over a bridge into a river, at the age of 37 years. After three years in the office of McKim, Mead, and White, of New York, and two years of study and travel in Europe, he began active practice in New York in 1885. While established there he designed several buildings for Princeton College, the most important one being the Art Museum. He afterwards migrated to San Francisco, where he very shortly built up a large practice. During the seven years of his residence there he built the eleven-story Crocker Building, which cost a million and a quarter of dollars, the Donahue-Office-building, Trinity Church, the Old People's Home, and many private houses. The building through which his name became known to the greatest number of people was the California State Building at the Chicago Exhibition, and he afterwards designed many buildings for the Mid-winter Fair at San Francisco. He sought in this work to adapt the style of the Spanish Missions to modern buildings.

## CHIPS.

At Spalding, a new iron fence to the river has just been completed by the contractor, Mr. Stevenson, making now a uniform fence from the end of Vine-street to the new Locks Mill Bridge.

Colonel W. Langton Coke, Inspector to the Local Government Board, attended at the Kersley district council offices on Tuesday week, to inquire into an application by the council to borrow £3,783 for works of private street improvement and sewerage. Mr. T. Nuttall, of Bury, Lancs, the surveyor, explained the proposals.

The Peterborough Town Council have decided to apply to the Local Government Board for sanction to borrow £20,000 for the electric lighting of the city.

Mr. Arthur Hartley, architect, of Castleford, has been appointed surveyor to the Normanton Urban District Council.

At the annual meeting of the South Hants Waterworks Company, held at Southampton, on Friday, an honorarium of £600 was voted to Mr. J. C. Amos, the engineer, for special services rendered during the last four years.

Proceedings were taken against the East London Waterworks Company by John Benjamin Kyffin, a householder in Hackney-road, for failing to give him a sufficient water supply last July, but the magistrate dismissed the summons. The matter came on the 13th inst. before a Divisional Court, composed of Lord Justices Lindley and Kay, who, after the arguments of counsel, decided that a private individual could not sue for deficiency of supply to a district, and that if the applicant desired to sue in respect only of the deficient supply to himself, he must proceed under the general Waterworks Clauses Act of 1847.

Messrs. Fambirini and Daniels, Architectural Concrete Works, Lincoln, have secured the contract for supplying buff and red artificial stone dressings, together with concrete steps and paving for terrace, &c., to the Alexandra Hospital, Woodhall Spa. Messrs. D. Taylor and Son, Lincoln, are the contractors; and the architect is Mr. Temple L. Moore, Old Queen-street, Westminster.

The parish church of Llansaintfrad-in-Elvel was reopened on Thursday in last week after rebuilding. The new structure is built on the exact site of the old church, and the old materials, wood and stone, were reused as far as possible. The new church consists of a chancel, nave, and vestry. The seats are of oak. Mr. F. R. Kempson, of Hereford and Cardiff, was the architect, and Mr. J. Price, Builth, the contractor.

The plans committee of Aberdeen Town Council passed plans for a new church, to be erected on Rosemount Viaduct for St. Paul-street United Presbyterian congregation. The church will be seated for 620 people, and will cost about £5,000.

An eagle lectern of English oak has just been placed in the 15th-century parish church of St. George, Thraselton, near Plympton. It is the handwork of Messrs. Harry Hems and Sons, of Exeter.

A new hotel is about to be built at Dunbar, from plans by Messrs. Dunn and Findlay, of Edinburgh. It is designed in the Scottish Domestic style, and will have bedroom accommodation for 70 persons, and dining-room to accommodate 100. There will also be drawing, reading, writing, and billiard-rooms. The cost will be over £11,000.

## COMPETITIONS.

BRADFORD.—Premiums of £30, £15, and £10 were offered, and 72 sets of designs were sent in, for the New Home for Nurses, to be built by the Bradford Union. Mr. W. Ward, of Birmingham, acted as professional referee. The assessor placed the awards in the following order:—1, "A. W."; 2, "B. Q."; 3, "B. P." The committee recommended that "A. W." should have the first premium; the second prize to "B. P.," and the third to "A. I.," and this was carried after one member of the board had protested against the professional expert's decision being thus overridden, saying that "No doubt some of the committee would be ready to take command of the Channel Fleet or of an expedition to Coomassie." This caused great laughter, but only one dissentient vote was recorded against the recommendation of the committee. The winners of the premiums are:—1st, Messrs. J. H. Morton, of South Shields, and J. P. Key and W. Twist, of Leeds, joint architects; 2nd, Messrs. Clark and Moscrop, Darlington; and 3rd, Messrs. Empsall and Clarkson, Bradford. It was pointed out, however, at the meeting, that there is no undertaking that either of the premiated firms will be chosen to carry out the work.

EXETER.—The building committee for the new church of St. David held a meeting on Friday evening to receive a report from the executive committee as to cost of carrying out the designs placed first and second by the assessor, Mr. James Brooks. The report stated, first, that the committee had caused inquiries to be made of several contractors of influence in Exeter as to the comparative cost of building in the city of Bath stone or limestone. The contractors all agreed that limestone would not be dearer, unless an unusual amount of dressing were required, and most of them were of opinion that it would be cheaper. Secondly, the fact having been disclosed to the committee that plan B was the work of Mr. W. D. Caröe, they thought it desirable to inquire whether he would be willing that the external walls should be of limestone. He replied that he would be willing. Thirdly, the executive committee accordingly renewed their recommendation that design B be adopted, but with the substitution of limestone instead of Bath stone in the external walls. Several letters from West Country builders were read, the names being kept back, as the writers would, should tenders be afterwards invited, be competing against other contractors. In the first, the writer stated that 1s. per foot was an average price for masonry, but would not care to give it as a definite basis before considering plans and materials. In the second letter, the writer stated that Mr. Caröe's design could be carried out for 6d. or 7d. per foot, not only fairly, but in the best possible manner. In the third letter the writer said he considered Bath stone, treated as proposed by Mr. Caröe, greatly superior in beauty and effect to limestone, and fully as permanent. He would be quite willing to execute the work at the same figure, substituting limestone for Bath stone in the external walls. The chairman, the Rev. C. H. Valpy-French, moved the adoption of the executive committee's report and recommendation. They could not read the report of the assessor without seeing that he spoke exceedingly strongly with regard to B plans being superior to any other set laid before him. They had it on the authority of Mr. Caröe that his design could be carried out for £12,000; they had the statement of the assessor that it could be built for £12,000; and they had the knowledge of a firm of builders being prepared to build for £12,000. Mr. Shorto proposed, as a rider, the addition to the recommendation of the words "Accordingly, the committee renew their recommendation that design B be adopted, with the substitution of limestone for Bath stone in the external walls, if, by competition, a guaranteed tender is obtained from a responsible contractor for the erection of the church in its entirety for a sum not exceeding the specified limit of £12,000."

In reply to a question, the figures on which the assessor based his estimates of the cost of the plans in execution were given as follows:—Design A, 7d. per foot cube, £9,002; B, 6½d. in Bath stone, £11,771; C, 7d., £12,481; D, 7½d., £13,515; D 1, 7d., £13,111. The executive committee accepted Mr. Shorto's rider, and the report and recommendation thus added to were then adopted without opposition. It was resolved that the churchwardens be requested to call a vestry meeting (1) to consider the design adopted; (2) in the event of the vestry meeting



consenting to the carrying out of the design, to sanction the taking of the necessary steps to obtain a faculty for the purpose. It was further resolved that the whole of the sets of plans be placed in the Guild House for exhibition for ten days.

**NEWCASTLE-ON-TYNE.**—Twenty-six sets of plans were received for West Clayton Congregational church. The assessor was Mr. James Cubitt, F.R.I.B.A., who awarded the first premium to the design marked "Corner Stone," by Mr. G. W. Ward, of Newcastle; the second to that marked "Lough Model," by Messrs. Marshall and Dick of Newcastle; and the third to that marked "Parkholme," by Mr. Stephen Piper, also of Newcastle.

### CHIPS.

Mr. H. P. Neumanns, of Scarborough, has received a commission from the Scarborough Town Council to paint the portrait of the late Lord Leighton, to be placed in the council chamber.

The foundation-stone of the new public baths and washhouses for St. Marylebone was laid on Thursday in last week. The site in the Marylebone-road was formerly a recreation-ground known as the Yorkshire Stingo Tea Gardens. Mr. A. Saxon Snell, whose designs were selected in competition with 30 others, is the architect, and the work will be carried out by Mr. Charles Wall, of Chelsea, the contractor, at a cost of £43,800. There will be four swimmigp-baths—including one 100ft. long—110 warm baths, a public wash-house and laundry, with 80 washing compartments, towel laundry, laundry, superintendent's apartments, and board-room.

The Edinburgh town council rescinded on Tuesday its former resolution in favour of the construction of a bridge across the railway at Jeffrey-street.

From among 55 candidates from all parts of the kingdom, the town council of Southampton have appointed as inspector of buildings and drainage, Mr. J. L. Foot, of Southampton.

The Prince of Wales will visit Brighton on Saturday, the 29th, when he will lay the foundation stone of the new buildings of the Sussex County Hospital, at a cost of £25,000.

At the Manchester Art Gallery there is to be a black-and-white exhibition, including architectural drawings, during the coming April, May, and June.

The Mayor of Blackpool (Alderman Parkinson) died on Saturday after a few days' illness, aged 50 years. Alderman Parkinson, who was at one time a plumber, was elected to the council in 1882, and was in his second year of office.

In widening High-street, Sheffield, by removing the property on the south side, the corporation required land belonging to Mr. John Walsh, draper. He first asked as compensation £43,500, and subsequently increased his claim to £66,248. As terms could not be agreed upon, the matter went to arbitration, with Mr. D. Watney, of London, as arbitrator. He has awarded Mr. Walsh £28,844 as the total sum to which he is entitled.

At a general meeting held last (Thursday) night of the Royal Academy, Sir John E. Millais was elected president.

St. Luke's Church, Southport, is about to be enlarged, from plans by Mr. Huon A. Mateer, of Liverpool, at an estimated cost of £3,450.

The contract for the new pier at Dunoon, N.B., has been let, and operations have commenced. The works comprise a pierhead 40ft. long by 60ft. wide, with a gangway 170ft. long by 40ft. wide. The sea-wall from the Castle rocks to the band-stand, a distance of about 1,000ft., is also to be rebuilt. The existing gangway of the old pier will be reserved for goods traffic, the new gangway being solely for passengers. The cost of the undertaking will be £15,000, to which has to be added about £27,000 for the acquisition of the old pier and other property. The waiting-rooms are estimated to cost about £2,000.

The first and main block of the new Admiralty buildings, having now been completed from Messrs. Leeming and Leeming's plans, the authorities are preparing to clear the ground in Spring-gardens for a new wing between the old and the new Admiralty buildings. This proposed wing is at present occupied by twelve houses of considerable antiquity, which at one time were a centre of fashion. The houses will shortly be sold by the Government auctioneers in lots for demolition.

The Earl of Wilton, whose claim for £8,800 as the value of 13,159 square yards of land, with warehouses and offices upon it, at Denton, near Manchester, taken by the London and North-Western Railway Company, was the subject of an arbitration heard before Mr. Ralph Clutton, has been awarded £3,886.

### TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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### ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

### SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

### NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—E. J. Cousens.—F. R. J.—W. E. and Co.—B. J. S. (Goole).—D. T. and Co.—B. Fraser.—C. J. R.

### "BUILDING NEWS" DESIGNING CLUB.

PLUCK, J. M. D., AND OTHERS. (You can join at any time, as you will see by the conditions published in the BUILDING NEWS, Oct. 18, 1895).—DESIGNATEUR. (The archway to stable yard is intended to be located in the main front of the building for the village inn, as stated in the instructions last week).—CLERICUS. (See church plans and criticisms on same this week).—C. R. O. (The size of the sheets of paper is always the same (22in. by 14in.), as you will see in the rules.)

## Correspondence.

### FINISH FOR OAK.

To the Editor of the BUILDING NEWS.

Sir,—The four short suggestive papers recently read before the Institute by Messrs. Romaine Walker, W. Aumonier, Knox, and Frith on "Wood-Carving and Wood-Carvers" were as practical as entertaining.

One point alluded to by the first-named contributor seems to suggest a question which perhaps may be considered a very elementary one; but although a simple question, it is probably one to which an exactly simple answer can hardly be given. "What is the best finish for oak fittings and furniture"? A varied experience no doubt might furnish more than one reply. Mr. Romaine-Walker, speaking generally, says a mixture of beeswax and turpentine, repeated several times, and rubbed down with a hard brush. This no doubt is a capital recipe, and it has the great advantage of being a very old one; but the labour necessary renders it, nowadays at any rate, a very expensive method, and with elaborate work the use of a hard brush would be scarcely possible. My first association with Sir Gilbert Scott, humble as it was in its way, occurred before my pupil days in this connection, when I was working at the joiner's bench in the shops of a well-known church builder, helping to make a big, florid, Gothic oak rood-screen for one of

our great, popular architect's churches. His specification for finishing off the oak of this job provided an application of beeswax and turpentine, applied by circular pads of house-funnel (made by rolling up folds of that material), and I have often wondered what effect resulted in course of time from this treatment. When finished the work was rendered extremely sticky and susceptible to dirty accumulation, because the tact furnished by the wax caused dust and blacks to firmly adhere to its surface. As the wax hardened this in time would become less tenacious; but when new I much doubted the process, and never attempted it on my own account. French polish for oak often gives an ugly yellow colour, and fumigation only partly overcomes this difficulty. The old work which we all so much admire was simply left—was it not?—quite plain from the tool, and is this not the best method to adopt? For carved parts, at any rate, surely it must be so. I once made a tee-square of oak out of an old pew-panel, which was perfectly dark right through its thickness.—I am, &c.,

MAURICE B. ADAMS.

## Intercommunication.

### QUESTIONS.

[11480].—Public Hall or Assembly Room.—What number of people would a public hall or assembly-room 80ft. by 35ft. accommodate?—or how many square feet is allowed for each person, the hall to be one story in height? IRISH READER

The Bishop of St. Alban's has dedicated a number of costly gifts with which the parish church of Chigwell has been enriched since its consecration, exactly nine years ago. These included the holy table; the reredos, of alabaster, subject, the Annunciation; the hangings of fine tapestry and altar-cloth, and the panel paintings, all designed by Mr. G. F. Bodley, A.R.A.; the new pulpit, also designed by Mr. Bodley; the east window, and a small window.

An inquiry opened on Tuesday week, and continued on Wednesday of the present week, has been held at St. Mary's Hall, Coventry, before Major Crozier, one of the Engineering inspectors of the Local Government Board, into the scheme for the disposal of the sewage of Coventry upon land at Baginton. This scheme proposes to treat the sewage chemically at the present Whitley works, which will be enlarged for the purpose, and to conduct the purified effluent to Baginton for filtration upon land there, before entering the Sherbourne and Sowe. The scheme has been prepared by Mr. James Mansergh, C.E., of Westminster, who gave evidence in its support, and estimated its cost at £30,000.

A free public lecture on "Architecture" will be given by Professor Banister Fletcher, J.P., F.R.I.B.A., in the theatre of King's College, Strand, W.C., on Tuesday evening next, at 8 p.m.

The promoters of the proposed Avondale and Douglas Railway have given notice that it is not their intention to proceed any further with the Bill in the present session. Under this Bill, powers were sought to construct upwards of 38 miles of railways in Ayrshire and Lanarkshire, of which 27½ miles were intended to constitute a new main line from the Darvel branch of the Glasgow and South-Western Railway to Douglas. The remaining 10½ miles of proposed railways constituted four branch lines from the main line in question.

At Kingston-on-Thames on Wednesday William Westfield, *alias* Colonel Western, an engineer; William Brett, *alias* Captain Clarke, surveyor; and Clifford Holden, builder, were charged, on remand, with conspiring together and obtaining goods and moneys from various persons by false pretences, under the style of the Castle Engineering Company, Queen Victoria-street, and were committed for trial at the ensuing quarter sessions. The magisterial examination has extended over six weeks.

The new statue of the Queen, to be placed in the quadrangle of the Royal Exchange, which Mr. Hamo Thornycroft, R.A., is executing for the last eight years, will be ready for the pedestal by Her Majesty's birthday. The block of marble out of which the statue has been sculptured weighed 11 tons, of which about one-third has had to be cut away in the execution of the work. The process of filling the ambulatory of the Royal Exchange with frescoes by distinguished artists, of which Lord Leighton gave the first, has made some progress, four or five more panels being promised by public-spirited donors, and it is hoped that, with the aid of the City Companies and the merchants of the City, the whole series will be gradually completed.



## Legal.

### A WATER COMPANY CASE.

FROM an interesting and important judgment delivered by Lord Justice Lindley, upon an appeal in a case against the East London Waterworks (*Times*, Feb. 11), two main points can be gathered. Firstly, the Metropolitan Water Act of 1871 does give the proper local authority the right to proceed against a water company failing to supply water to a district for the recovery of a penalty of £200, with further penalties of £100 a month while in default. Secondly, it seems equally clear that an inhabitant who has paid his water rate in advance can proceed against the company under s. 43 of the Waterworks Clauses Act of 1847, for the recovery of the penalty of 40s. a day while the failure to supply continues. In other words, these two distinct principles are to be found in the scheme of the statutes affecting our water companies. But the Court held that individuals cannot proceed for penalties under the Act of 1871, as this must be done by the Metropolitan authority for the district where the water supply is insufficient. The judge laid it down that no inhabitant can summon a company for the penalty of 40s. a day unless he has complied with the condition of having paid his water rate in advance. In the case cited the complainant had not done this, and so he lost; but his attempt had the result of getting a very clear statement of the law from the judges who heard his appeal.

Our water companies have really done as they liked for so long, that one is almost surprised to find there is actually any sort of summary process by which they can be brought to book. It seems, however, to be clear that if an inhabitant keeps his water rates paid up, he can summon the company to the police-court for the penalty of 40s. a day for his own benefit during the time he is left without a sufficient supply of water for domestic purposes, apart, of course, from all question of an unusual frost or the like. It would be, as well, if this remedy were put in force occasionally, and it would be still better if the local authority could be induced to use its greater power of recovering the heavy penalties chargeable when a whole district is left waterless.

FRED WETHERFIELD, Solicitor.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

W. W. R.—LEASE.—NUISANCE.—DRAINAGE.—The local authority can serve notice as to nuisances upon either or both the owner or the occupier. In this case B, as the owner—that is, the person who receives the rack rent—would be liable to the Council. But it may be that he has a remedy against his lessee under the covenants quoted, and in that view he should first call upon A to do the work required.

H. H.—BUILDER.—PERQUISITES.—The foreman would have no legal claim whatever to the wood in question, or anything of the sort.

QUERY.—SALE OF STONE.—DISCOUNT.—It is very doubtful whether you can recover the discount deducted, because by sending the goods ordered after their letter as to discount you may be held to have given way upon this point. Your safer course would have been to stop the order until your terms were agreed.

W. E.—LAND.—CONTRACT.—RESCINDING.—The clause quoted seems to give the vendor power to act as proposed, and he would probably be safe in so doing if the default is clear, and if no breach of the peace is committed.

The Plumbers' Company have reintroduced their Registration Bill. It is backed by Mr. Lees Knowles, Earl Compton, Mr. Dixon, Dr. Farquharson, and Mr. Sexton.

At a meeting of the promoters of the proposed Turkish baths for Exeter, held on Friday, it was stated that the scheme was to form a limited liability company with a share capital of £2,000, in shares of £5 each. The site contemplated is that on which the almshouses recently stood in Northernhay-street. Plans of the buildings have been prepared by Messrs. Tonar and Ralling, of Exeter.

The formal approval of the shareholders of the Great Western Railway Company has been given to the Bill to be promoted this season for the construction of a new railway, about 31 miles in length, from the main line of the company's railway at Wootton Bassett to the Bristol and South Wales Union Railway, near Patchway. The construction of the line will shorten the distance between London and South Wales by about ten miles, will avoid the steep gradients upon the existing line through Box Tunnel and at Wootton Bassett, and also afford relief to the main line at Bristol.

## LEGAL INTELLIGENCE.

THE IMPROVEMENTS AT POETS' CORNER.—The improvements at Westminster Abbey, which have led to the demolition of the row of houses from No. 1, Poets' Corner, and No. 1, Old Palace-yard, to the premises occupied by Mr. Labouchere, opposite to the principal entrance to the House of Lords, were the occasion of an arbitration case which was heard on Monday by Mr. E. Farmer at the Surveyors' Institution, Great George-street. Messrs. Gedge, Kirby, and Co., who formerly occupied No. 1, Poets' Corner, claim a sum of £10,000 from her Majesty's Commissioners of Works for disturbance. Evidence was submitted to show that the claimants had 8½ years' lease to run and had been put to various expenses, including the removal of 40 tons of papers and the carrying out of a scheme of accommodation to put their new premises in a similar position to the old. On the other hand, the Attorney-General sought to show that the amount of claim should be reduced in many particulars. The arbitration was continued on Tuesday and Wednesday, when it terminated, the arbitrator reserving his award.

A BUILDER'S CONVICTION AFFIRMED ON APPEAL.—In the Divisional Court, on Saturday, Lords Justices Lindley and Kay heard a motion showing cause against a rule for a *certiorari* to quash a conviction of a builder named Goodwin at Gillingham, near Rochester, for breach of by-laws of the Gillingham Urban District Council. The ground on which the rule was obtained was that a Mr. William Tozer, a justice of the Bench which had convicted and the chairman of the Gillingham Urban District Council, who were prosecuting, and therefore himself interested in the prosecution, had taken part with the other justices on the hearing. Affidavits had been made by the magistrates and others denying the alleged intervention. In support of the rule the following cases were cited: "R. v. Suffolk Justices," "R. v. Meyer," "R. v. London County Council" (1892), "R. v. Yarmouth Justices." The Court discharged the rule, but without costs.

## CHIPS.

A new Masonic hall is being built in Nile Court, Ayr, from designs by Mr. John Eaglesham, the official architect to the Lodge. The chief room will be 42ft. by 30ft. The contract for masonry has been taken by Messrs. Andrew Wyllie and Sons, and that for joinery by Messrs. J. and D. Meikle. The cost will be about £2,000.

The Presbyterian Church at Donaghadee has been reopened after reconstruction, including reseating in pitch-pine, and the additions of a gallery. Mr. T. Pentland, of High-street, Belfast, was the architect, and Mr. Hugh Barrows, of Newtownards, the builder.

An out-patients' department is about to be added to the Sussex County Hospital at Brighton, from designs by Mr. F. T. Cawthorn, of New-road, Brighton. Messrs. Saunders and Sons, of Brighton, have taken the contract at £3,800.

The Margate Town Council were informed, on Tuesday, that Mr. Woodward, of Camden-road, Croydon, had presented to the town the Dane Park Farm, a well-timbered area of 33 acres, to be converted into a public park.

On Sexagesima Sunday a chancel-screen, new pulpit, and faldstool were dedicated by the Bishop of Rochester at St. Peter's, Eltham-road, Lee. The chancel-screen is made of wrought iron, and the pulpit and the faldstool are of carved oak.

Messrs. Higgs and Hill, builders, of Crown Works, South Lambeth-road, London, ask us to mention that their saw-mills and joiners' shops were not destroyed in the fire that occurred there on Feb. 12, and that they are able to continue work as usual.

The parish church of Duffield is about to be restored under the direction of Mr. J. Oldrid Scott, F.S.A. New choir stalls and a pulpit will be provided, and the east window is to be filled with stained glass designed by Mr. C. E. Kempe.

The Civil Service estimates for the year ending March 31, 1897, were issued on Tuesday. The total amount is £1,912,852, being an increase of £125,704 on the grants made for the present year. For the royal palaces and Marlborough House is £39,000, an increase of £4,400; royal parks and pleasure gardens £108,000, increase £100; Houses of Parliament buildings £34,000, increase £75; Admiralty Offices extension £25,000, increase £800; surveys of the United Kingdom £220,210, increase £1,000; harbours under board of trade and light-houses abroad £48,375, increase £30,135. The only item showing a decrease is that for public buildings in Great Britain, the charge for which is £202,000, or £15,600 less than in the year expiring.

The Queen has abandoned her intended visit for this year to Sheffield, where the Duke of Norfolk had been expressly elected mayor in anticipation of the opening of the group of Municipal Buildings, erected from the designs of Mr. E. W. Mountford.

## Our Office Table.

THE seventieth exhibition of the Royal Scottish Academy, opened on Monday, is the best display of work that has been seen in Edinburgh for many years past, and justifies the motto on the catalogue, a quotation from Principal Caird, "All art that is worthy of the name is creative." The exhibits number 650, and among them may be found Watts's portraits of Walter Crane and Mrs. Ellice, of Invergarry, Holman Hunt's "Strayed Sheep," James MacWhirter's "June in the Austrian Tyrol" (the property of the Chantry Bequest Trustees), Loughton's "Teresina," Alma Tadema's "Mrs. Hill and her Children," and a sketch by the new P.R.A., "The Bride." The principal portraits are by Sir George Reid, John Lavery, E. A. Walton, Alexander Roche, and Otto Leyde. J. C. Hoole, Robert Macgregor, Campbell Noble, Pollock Nisbet, and W. E. Lockhart contribute noteworthy sea pieces. The chief landscapists are John Smart, W. D. McKay, Robert Noble, J. Lochhead, and Lawson Wingate. The leading genre and historical subjects are, Orchardson's "Reception," George Hay's "Robert Grame in Loch Leven Castle," William Hole's "Cotter's Saturday Night," and Ogilvy Reid's "Prince Charlie Presenting his Sword to Lord Dalquharn." The best exhibits in the sculpture gallery are by Onslow Ford, Pittendreich Macgillivray, John Hutchison, Birnie Rhind, D. W. Stevenson, and Charles M'Bride.

"THE MAUSOLEUM AT HALICARNASSUS" was the subject of a paper read before the Hellenic Society on Monday by Mr. Edmund Oldfield, F.S.A. Professor Percy Gardner was in the chair. Mr. Oldfield pointed out that the restorations at the early part of the present century were purely speculative and founded on a few passages in ancient writers, which were merely desultory references, sometimes parenthetical, figurative, or even contradictory of each other, and then proceeded to deal with the discoveries of 1846 made by the late Sir Charles T. Newton when he was Vice-Consul of Mitylene. Sir Charles Newton suggested a restoration, in which he was assisted by Professor Smith and the late R. Popplewell Pullan, but which was assailed by James Fergusson, who proposed a restoration of his own, founded on the same materials, but arriving at a different conclusion. A third scheme was propounded by Herr Petersen, of Hamburg. Mr. Oldfield was an assistant 40 years ago when the Mausoleum marbles arrived at the British Museum, and he assisted at their unpacking. Since then, and especially since his retirement, he had devoted much labour to solving the mystery which had been still left in obscurity by the three elaborate schemes of Newton, Fergusson, and Petersen. The references in ancient writers were few. There was a passage of Vitruvius, a few lines in Martial, and a description in Pliny's "Natural History." Pliny described the mausoleum as "hanging in empty air," which might refer to the many intercolumnar spaces in the roof. Professor Cockerell, Watkiss Lloyd, and others had done their best to reconstruct the mausoleum in accordance with Martial's description. But Newton could not accept their conclusions. The passage in Pliny was the fullest description extant; but the text was not quite certain.

MANY ingenious experiments in church planning are to be seen in America. One of the latest we have seen is a Nonconformist church at Boston, Mass., in which the side walls form an acute angle at the end farthest from the pulpit platform. The angle is cut off internally, which makes a kind of semi-octagonal shape for the auditorium, the portion so cut off forming an upper vestibule with staircases. Two other staircases are placed one on either side of the platform end. The seats are arranged in segmental curves, with radial passageways. The pastor's study or vestry is behind the pulpit platform, and the farther end forming the acute angle outside the vestibule is finished as an apsidal-shaped mothers' room. The ground floor, under the auditorium, has vestry and classrooms, porches, and conveniences at the corner. There is also a gallery round three sides. Acoustically, the building ought to be a success.

If, according to Professor Ferdinand Herach, experiments have shown that the compressive strength of wrought iron at 300° C. falls to 90 per cent., at 500° C. to 40 per cent., and at



700° to 20 per cent., the results will add to the already great risks of iron for fire-resisting construction. If a factor of safety of 3 or 4 is taken, the breaking point would be reached at a temperature of 600° C. in the first case—a possibility that might be attended by serious consequence in some buildings.

We hear that two-thirds of the space is already let to some of the leading firms in the building world, in connection with the Building Trades Exhibition to be held in St. James's Hall, Manchester, from April 20 to May 9. This is not to be wondered at, as it is just ten years since a building trades exhibition was held in Manchester.

According to the *American Architect*, a singular piece of negligence in the custody of pre-miated plans has led to a deadlock in the proposed distribution of the prizes in the abortive competition for a new city hall for New York. The legislature of that State recently passed an order, authorising the comptroller of the City of New York to pay the prizes promised to the winners of the competition for the new city hall. The municipal building commission met the other day for the purpose of carrying out the duty contemplated in the order, but encountered an unexpected difficulty. After the selection of the six best designs by the board of experts, some three years ago, and the subsequent passage of the statute forbidding the erection of the building in the City-hall Park, the plans were stored away in an unoccupied room in one of the city buildings. As no appropriation had been made for paying a man to look after them, no one looked after them. The six selected plans were put among the rest, and the whole collection, numbering 134 sets, was piled up together. Moreover, the sealed envelopes, containing the names of the authors of the designs, were piled up somewhere else, but no one now knows where. As not even the experts opened the envelopes, no one can say who were the authors of the six selected designs, even if they could be separated again from the mass of the collection, and there is said to be no alternative but to advertise for claimants for the ciphers attached to the designs.

The return of frost, if we are to have any, will create apprehension in the minds of many who have had some experience with their water supply and kitchen boilers. As we pointed out the other day, the rules published by the Manchester Steam Users' Association are plain, and should be consulted by all householders. The advice given that every boiler should be fitted with a small safety-valve of the dead-weight construction, is sound, as no complicated mechanism, or springs, can get out of order. If the outlets are choked by ice, or otherwise stopped up, the valve so weighted would emit a slight hissing noise, which would at once give a warning.

A LARGE model of ancient Rome will shortly be added to the treasures displayed in the Walker Art Gallery at Liverpool. The model has been in the possession of the corporation for many years, and is now brought to light after two decades of obscurity in the museum. As the thousands of pieces which form the model were nearly all displaced and in utter confusion, the task of restoring it has proved a troublesome one, notwithstanding the fact that a descriptive plan by the designer, a talented Italian, who completed the model early in the century, has been discovered. Mr. C. H. Dyall, the curator of the gallery, has devoted much time and labour to the work, assisted by Dr. Caton, who is compiling a detailed description of the ancient city in miniature. Situated at the extreme end of the east museum, it will be inclosed in a large glass case.

THE second annual dinner of the principals, heads of departments, and representatives of the firm of Messrs. Young and Marten, Stratford, was held at the Holborn Restaurant on Saturday week. Mr. H. H. Marten (principal) occupied the chair, and Mr. E. Montague Edwards (general manager) the vice-chair. The Vice-Chairman proposed "The Firm," and said he felt confident that he was re-echoing the sentiments of everyone present in saying that it gave them very great pleasure to see Mr. Marten in that honoured seat on this occasion, and it was to them a source of much regret that he was unable to be there last year. The Chairman, in responding to the toast of "The Firm," said he had to congratulate all on the successful issue of last year's trading. The volume of trade was much larger than in any preceding year, but what is more important, the net result was correspondingly good. When he

first joined the late Mr. Young, he recollected their first representative, Mr. Cray (now deceased), made a remark to him which he should never forget. On congratulating him upon coming to Stratford, he said, "The sun always rises in the East." Well, the sun of material prosperity had risen in the East as regards the firm of Young and Marten, and he trusted that should any clouds arise, which necessarily must happen sometimes, they would soon pass away, and be a prelude to greater brightness and prosperity in the future. The Chairman then proposed the toast of "The general manager and staff." He felt sure no words were necessary on his part to add to the esteem and respect that Mr. Edwards was held in, not only by himself, but by all present that evening. Mr. Edwards, in response to the toast, said that after Mr. Marten's encouraging words they must "go forward" during the year which they had entered. He, with the members of the staff, would do all that was possible to push forward the interests of the business. Mr. Edwards further remarked that he had always found in Mr. Marten a companion as well as a master and employer. He (Mr. Edwards) was ready at all times to sympathise with the heads of departments in their troubles, and assist them out of their difficulties.

### CHIPS.

St. John's Church, in Staleybridge-road, Crewe, was formally opened last week. It is the first section of a complete scheme, is seated for 500 worshippers, and has cost £3,200.

Messrs Peak, Frean, and Co., the well-known biscuit manufacturers, are about to erect large works in Haxby-road, York.

Mr. Conrad Dressler has completed, at his studio in Birkenhead, a bust in Carrara marble of the organist, Mr. W. T. Best, which is destined to be placed in St. George's Hall, Liverpool. Mr. Dressler is also executing two of the external panels for the same hall, the subject of each being "The Imports of Liverpool." The remaining four panels are being sculptured by Mr. T. Stirling Lee and Mr. Allen.

The sum awarded to the Eyre Estate trustees for the 4½ acres of land in St. John's Wood required for the Manchester, Sheffield, and Lincoln extension to London is just over £301,000.

At Sheffield a new main sewer has been laid down in Abbeydale-road, from a group of board schools to the city boundary at Totley. It is oviform, being 3ft. high and 2ft. wide, and has been carried out during the past three years by corporation workmen, from plans by, and under the direction of, Mr. C. F. Wike, city surveyor, at a total cost of about £13,000.

The London County Council are taking this week the first practical step towards rebuilding Vauxhall Bridge. The large paved open space on the Albert Embankment, a little beyond Messrs. Doulton and Co.'s Art Pottery Works, has just been surrounded with a timber hoarding preparatory to the commencement at this point of the temporary wooden bridge which is to accommodate the traffic pending the demolition and rebuilding of the old structure. The temporary bridge will be just opposite Mr. Sidney Smith's Tate Art Gallery, on the site of the old Millbank Penitentiary.

The will and codicil of Mr. Joseph Freeman, of 15, Radnor-place, Gloucester-square, Hyde Park, and of 7, Calverley Park, Tunbridge Wells, who died on December 25, has been proved, the value of the personal estate amounting to £242,202. Legacies are left to two hospitals, to relatives, to persons in the employ of the firm of John Mowlem and Co., servants, and others. All his real estate and the residue of his personal estate he leaves equally to his sons, William Robert Freeman, John Joseph Freeman, and Russell George Freeman.

A sub-committee of Edinburgh Town Council, after consideration, recommend the erection of two tenements of five and four stories in the vacant area at Braid's Close, West Port, consisting of one and two-roomed houses, at a probable cost of £5,150; and of three tenements of five stories in the vacant area at Cowgate and High School Yards, at a probable cost of £10,500. The Edinburgh Corporation have adjourned consideration of the report till Wednesday night.

A new post-office is to be built for Gateshead on a site extending from West-street back towards High-street, and covered at the frontage in West-street by the plain stone house in which lived and died Thomas Bewick, the father of wood engraving (1753-1828), and his daughters, Miss Isabella Bewick and Miss Jane Bewick. The "Bewick House" will have to come down in the course of operations, and thus will be removed one of the few remaining historical landmarks in the neighbourhood.

### MEETINGS FOR THE ENSUING WEEK.

MONDAY. Society of Arts. "The Chemistry of Metals and their Compounds used in Building," Cantor Lecture No. 2, by Prof. J. M. Thomson, F.R.S.E. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "The Electric Street-Railway System of Montreal," by Granville C. Cunningham. 8 p.m.  
Society of Arts. "The Palette of the Artist," by William Burton, F.C.S. 8 p.m.

King's College, Strand. "Architecture," by Prof. Banister Fletcher. Free Public Lecture. 8 p.m.

Auctioneers' Institute. "Provincial Auctioneers: their Position, Practice, and Prospects," by John Hepper. 8 p.m.

WEDNESDAY.—Society of Arts. "The Standard of Musical Pitch," by A. J. Hipkins. 8 p.m.  
Northern Architectural Association. "The Antiquities of Jerusalem and the Temple Area," by John Potts. 7.30 p.m.  
St. Paul's Ecclesiastical Society. "St. Alban's Day and St. Mary Magdalene's Day," by the Right Hon. Lord Aldenham; and "St. Cypryan's Day," by Dr. J. Wickham Legg, F.S.A. 8 p.m.

THURSDAY.—Society of Arts. "The Tobacco Industry of India and the Far East," by C. Tripp. 4.30 p.m.

Mr. R. B. Dawson has resigned his position as head-master of the Rochdale School of Art, on appointment to the head-mastership of the important School of Art at Kidderminster, the centre of the carpet-weaving industry. Mr. Dawson has been in Rochdale about seven years, having been appointed first headmaster of the Rochdale Municipal School of Art on leaving the National Art Training School, South Kensington.

The hearing was concluded on Saturday of the suit of Parker v. Parker and Lawrence, in which Mr. William Parker, assistant surveyor to the Hereford Town Council, petitioned for a divorce on the ground of his wife's alleged misconduct with Mr. Arthur Tiverton Lawrence, who at the time was a reporter on a Hereford paper. The misconduct was denied, and there was also a plea of condonation, it being alleged that after the husband heard of his wife's misconduct they lived together in Jamaica, where he had obtained an appointment as superintendent of roads. His lordship dismissed the petition with costs, on the ground that the offence had been condoned.

The necessity of providing more spacious offices and parade room for the Southport police is occupying the attention of the watch and public halls committee. The proposal under consideration is to keep the police in the same building, and to erect new offices for the other corporation officials on a site owned by the corporation to the east of Christ Church. In case this be carried out, the church would be bounded on both sides by the municipal buildings, which at present are all connected.

A chancel is about to be added to the church of St. Julius, Buxton, from designs by Sir A. W. Blomfield, A.R.A., at a cost of about £2,200.

At Tuesday's meeting of the London County Council, a discussion took place on a recommendation by the Fire Brigade Committee in reference to breaches by Messrs. Scharien and Co. of the provisions of their contract with respect to the wages paid to the men employed on plumbing work at the new Kennington fire-engine station. The committee recommended that no action should be taken; but this was objected to by the labour members, and Mr. H. R. Taylor moved that the council should exercise its powers of deducting sums in respect of the breaches of contract alleged. The amendment was carried by 56 votes to 50, and it was further agreed that the amount to be deducted should be fixed by the Fire Brigade Committee.

The Bishop of Liverpool formally opened, on Monday, the day-schools of St. Athanasius' Church, Fountains-road and Chancel-street, Kirkdale, which were commenced in 1886, and have now been finally completed at a total cost of £5,250. Accommodation is provided for 1,100 children.

At the last meeting of the town council of Southampton, a report was presented by the Housing of the Working Classes Committee, showing that the total claims in respect of the properties in the slum area to be cleared under the Act of 1890 come to £41,283, a sum vastly in excess of their estimated value. The committee were authorised to make offers amounting in the aggregate to £41,285.

On the West Cliff, Folkestone, a new Congregational church is about to be built at a cost of £5,000. Accommodation will be provided for 830 persons.

The parish church of Alresford, Hants, is about to be restored, and the chancel rebuilt from plans by Sir A. W. Blomfield, A.R.A. The proposed outlay is £5,500.

The Board of Trade and the Public Works Loan Commissioners have sanctioned plans for the extension of Peterhead harbour at a cost of £36,000.



## Trade News.

### WAGES MOVEMENTS.

**BLACKPOOL.**—A deadlock in the dispute between the master joiners of Blackpool and the workmen was reached on Monday. The local branch of the Amalgamated Union of Joiners withdrew the hands from one place because the Union secretary had been discharged, as they considered, unfairly, and as they have refused to return to work all the other employers except two have closed their works. In the first instance the dispute arose over an application for an increase of a 1d. an hour. The masters offered a ½d. in the winter and a ¼d. in the summer, or the average of the wages paid throughout Lancashire. Negotiations are now at a standstill.

**EDINBURGH AND LEITH.**—A mass meeting of Edinburgh and Leith joiners was held on Friday night in the Albert Hall, Edinburgh, Mr. John Nisbet presiding. There was a very large attendance. The proposed new code of working by-laws was submitted. They are as follows:—(1) The standard rate of wages for competent workmen shall be 8½d. per hour, to be paid weekly. (2) The regular working hours shall be fifty-one per week—nine hours per ordinary day and six hours on Saturday. Work not to begin earlier than 6 a.m. and to cease at 5 p.m. on ordinary days, and 1 p.m. on Saturdays. From November 8th to February 8th the working hours shall be forty-five per week—eight per ordinary day and five on Saturday. All time in addition to the foregoing to be paid for at the rate of time and half up till 10 o'clock p.m. for the first five days of the week, and 5 p.m. on Saturdays. After these hours and till usual time of starting double time to be paid. (3) Within three miles beyond the municipal boundaries 6d. per day to be allowed as travelling money; if over three miles, 6s. per week, and railway fares to and from the job to be allowed. (4) After 30 hours' work with an employer, men to receive one hour for the purpose of putting tools in order; but if 51 hours have been wrought, two hours to be allowed for that purpose. (5) Employers to provide means for workmen warming their meals at outside jobs and in workshops, and to find some one to attend to the same; also to provide a lockfast place for tools. (6) No piece or task-work to be wrought by workmen, and no sub-letting, unless sub-contractor supplies plan and material. (7) The above rules and regulations to take effect on 14th March, 1896, and notice of alteration only to be given on or before 14th February in any year, and alterations not to come into force till 14th March following. With the exception of the second, the by-laws were carried unanimously, and the second by-law was adopted after some discussion by a very large majority. These by-laws will be forwarded to the employers.

**GLASGOW.**—The master joiners and carpenters were asked, on Friday, by the operatives for an advance of a ½d. an hour, making a rate of 9d. The notice expires on the 5th March.

**PORTSMOUTH.**—The threatened strike by Portsmouth brickmakers has been avoided by the amicable settlement of the dispute. An advance of between 6d. and 9d. per 1,000 bricks has been secured, a code of rules agreed upon, and the masters have promised to provide a mess-room and sanitary arrangements. The General Labourers' Amalgamated Union has lately increased its membership in Portsmouth by 1,000.

### CHIPS.

New board schools have been erected at Skirbeck, near Boston, Lincs, from plans by Mr. Bicknell. Mr. S. Sherwin was the contractor.

Mr. Henry D. Walton was the lecturer at the sixth meeting for the session of the Architectural Section of Glasgow Philosophical Society, which was held on Monday night in the Rooms, Bath-street, Glasgow. The subject was "The Evolution of Church Planning."

At Sion College, on Tuesday, the three-quarter length portrait of the Bishop of London, painted by Professor Herkomer for the walls of Fulham Palace, was presented to the Bishop in the presence of the subscribers. The Duke of Westminster occupied the chair.

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### TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering, at any rate, of the accepted tender: it adds to the value of the information.

**BATH, SOMERSET.**—For levelling, walling, and fencing the Camden-crescent View Site, for the Pleasure Grounds Committee of the Bath City Council, in accordance with drawings and specifications prepared by and under the superintendence of Mr. E. S. Payton, No. 3, Wood-street, Bath, architect and surveyor:—

A.	B.	C.	D.
Mould Bros.—			
£20 0 0	£20 0 0	£95 0 0	£10 0 0
Webb, W.—			
265 0 0	15 0 0	—	—
Erwood Bros.—			
236 0 0	14 10 0	—	—
Hancock and Davis			
215 9 8	—	—	—
Pursey, G.—			
—	—	95 12 0	10 0 0
Mariner, West, and Tyler			
—	—	68 0 0	pro rata
Fletcher, F. W.*			
144 0 0	19 15 0	85 0 0	10 0 0

\* Accepted. All of Bath.  
A.—Walling, &c. B.—Allowance if certain work is not carried out. C.—Iron fencing. D.—Allowance if certain work is not carried out.

**BIRMINGHAM.**—For repairs to the tower of Osler-street Board School:—  
Turton, J. A. (accepted).

**CAMBERWELL.**—For the erection of new bottling stores at the Crescent Arms Tavern, Southampton-street, Camberwell, for Mr. W. J. Huxley. Mr. W. J. Potter, architect:—

Browning, E., and Co., Whitechapel	£287 0 0
Dawes, F., Peckham Rye	225 0 0
Emmes, H., Peckham (accepted)	210 0 0

**CARDIFF.**—For the erection of the first section of the Cardiff Synagogue, Cathedral-road, Cardiff. Mr. Delissa Joseph, F.R.I.B.A., 17 and 18, Basinghall-street, London, E.C., architect. Quantities by Messrs. James and Morgan, Cardiff.

Lissaman, W., jun., Cardiff (accepted) ... £5,164

**CHELSEA.**—For enlarging and rebuilding offices, all departments, and providing additional lavatory accommodation and new drainage scheme at Star Lane School:—

Neal, G.	£2,296 0 0
Hammond, W.	2,256 0 0
Beattie, R. P.	2,207 0 0
Mallett, H.	2,200 0 0
Lyell, G.	2,190 0 0
Yerbury, R. A., and Sons	2,175 0 0
Nightingale, B. E.	2,166 0 0
Dawes, W.	2,130 0 0
Foxley, G.	2,100 0 0
Lathey Bros.	2,000 0 0
Garrett, J., and Son (accepted)	1,840 0 0

**CHELSEA.**—For erecting laundry centre, and removing and refixing infants' covered playground, at Westville School:—

Yerbury, R. A., and Sons	£1,154 0 0
Christie, J.	1,138 11 0
Gough, F., and Co.	1,074 0 0
Charteris, D.	1,058 0 0
Chichen, F. T.	1,042 7 8
Lathey Bros.	1,012 0 0
Neal, G.	960 0 0
Lyford, G.	933 0 0
Garrett, J., and Son	886 0 0
Nicholson, T.	864 0 0

\* Recommended for acceptance.

**CHELMSFORD.**—For small villa on the Hamlet-road.

Mr. R. Mayhew, Chelmsford, architect:—			
Chant and Son	£139 0 0		
Saltmarsh, G.	419 0 0		
Fincham, W.	417 10 0		
Saunders, W.	393 0 0		
Gowers, J. (accepted)	389 0 0		

All of Chelmsford.

**EAST HAM.**—For alterations, additions, and fittings at the Earl of Wakefield p.h., Katherine-road, East Ham, for Mr. J. T. Jones's executors. Mr. Fred. A. Ashton, 3, Crooked-lane, E.C., architect:—

	A.	B.	C.
Hearle and Farrow	£2,380	£779	£3,159
Cocks, J. and H.	2,105	680	2,785
Wall and Co.	2,092	651	2,743
Shurmer, W.	2,045	686	2,731
Bentley, J.	2,118	602	2,720
Watson, W.	2,020	680	2,700
A.—Building.			
B.—Fittings.			
C.—Total.			

**EAST LAMBETH.**—For erecting laundry centre, and executing sundry works to site, at Credon-road School:—

Dowds, W.	£1,091 0 0
Triggs, E.	1,091 0 0
Goad, W. V.	1,080 0 0
Castle, W. and H.	1,075 3 0
Akers, W., and Co.	1,035 0 0
Marsland, J.	1,014 0 0
Holliday and Greenwood	1,012 0 0
Otway, J.	1,011 0 0
Garrett, J., and Son	996 0 0
Maxwell Bros., Ltd.	842 0 0
Peacock Bros.*	818 0 0

\* Recommended for acceptance.

**EDINBURGH.**—For the reconstruction of the Albert Hotel, Hanover-street, for the Union Club:—  
Slater, J., Albert-st., Edinburgh (accepted) ... £4,500

**EDINBURGH.**—For erecting part of the new chimney at the Royal Infirmary. Messrs. Sydney Mitchell and Wilson, of Edinburgh, architects:—  
Bruce, Edinburgh (accepted) ... £160 0 0

**FINCHLEY.**—For enlargement, Hargrave Park school, for 144 boys, 144 girls, 144 infants (total 432), including halls, cloak-rooms, lavatories, teachers' room, stock-rooms, and covered playgrounds for all departments; additional w.c.s for boys and girls; art-room over the hall; schoolkeeper's house and cookery centre under; and drainage scheme:—

Green, T. L.	£18,520 0 0
Yerbury, R. A., and Sons	18,042 0 0
Maskin, C.	17,269 0 0
Killby and Gayford	17,180 0 0
Wallis, G. E., and Sons	16,980 0 0
Dabbs, W. M.	16,658 0 0
Patrick, J. and M.	16,544 0 0
Dove Bros.	16,520 0 0
Shurmer, W.	16,470 0 0
Lawrance, E., and Sons	16,382 0 0
Roberts, L. H. and R.	16,334 0 0
Cox, C.	16,263 0 0
Grover, J. and Son	16,237 0 0
Treasure and Son	16,121 0 0
Shillito, J., and Son*	15,945 0 0

\* Recommended for acceptance.

**FINCHLEY.**—For providing and fixing low-pressure hot-water apparatus for enlargement, extending apparatus to main building, and rearranging boiler for infants' department at Winchester-street School:—

Cannon, W. G., and Sons	£250 0 0
Clarke, J. F., and Sons	520 0 0
Jones and Attwood	508 0 0
Ellis, J. C. and J. S., Ltd.	479 10 0
Purell and Nobbs	393 0 0
Fraser, J., and Son	389 0 0
Defries, J., and Sons, Ltd.*	309 0 0

\* Accepted.

**FINCHLEY.**—For providing and fixing independent boiler, and hot-water radiators, and connecting up hot-water and gas radiators, thus forming small apparatus for auxiliary warming at Chequer-alley School:—

Berry, Z. D., and Sons	£404 0 0
Cannon, W. G., and Sons	388 0 0
Fox, W. J.	317 0 0
Matthews and Yates, Ltd.	276 0 0
Clarke, J. F., and Sons	201 0 0
Defries, J., and Sons, Ltd.*	185 0 0

\* Accepted.

**GREENWICH.**—For new school, Conway-road, for 414 boys, 414 girls, 414 infants, total 1,242, with schoolkeeper's house and manual training centre:—

Lathey Bros.	£24,973 0 0
Nightingale, B. E.	24,800 0 0
Hart Bros.	24,536 0 0
Pattinson, W., and Sons	24,010 0 0
Roberts, L. H., and R.	23,500 0 0
Dabbs, W. M.	23,292 0 0
Patrick, J. and M.	23,137 0 0
Longley, J., and Co.	23,098 0 0
Kirk and Randall	22,643 0 0
Lawrance, E., and Sons	22,542 0 0
Shillito, J., and Son	22,352 0 0
Wallis, G. E., and Sons	21,967 0 0
Holliday and Greenwood*	21,577 0 0

\* Recommended for acceptance.

**GREENWICH.**—For providing higher standard rooms on arches, with covered playgrounds for boys under, at the Plumstead-road school:—

Johnson and Co.	£2,968 0 9
Atherton and Dolman	2,852 0 0
Nightingale, B. E.	2,819 0 0
Proctor, E.	2,819 0 0
Smith, J., and Sons	2,791 0 0
Bulled, E. P., and Co.	2,754 0 0
Staines and Son	2,732 0 0
Mid Kent Building and Contracting Works (Limited)	2,720 6 4
Patrick, J. and M.	2,656 0 0
Kirk and Randall	2,613 0 0
Bowyer, J. and Co.	2,609 0 0
Longley, J. and Co.*	2,518 0 0

\* Recommended for acceptance.



## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2147.

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## THE PROVINCIAL PRACTITIONER.

THE local practitioner often finds himself in an attitude of hostility towards the London expert. Many circumstances conduce to this position. However able or experienced he may be, the provincial architect cannot escape the demands of competition. The old saying that a "prophet hath no honour in his own country" comes home with irresistible force whenever any large building is contemplated. The promoter or the committee think they may obtain something better from an outsider, particularly if he has designed and erected buildings of a similar class. We will not stop to inquire the reason for this opinion, or whether it has any justifiable foundation. In many cases we fear the idea is not borne out by facts. A hazy notion prevails that the man who has done a good thing in one place can do so in another; that there is a knack in supplying the best design in all circumstances. If it is a town-hall that is contemplated, the corporation invariably end in proposing a competition; no one in the town is supposed to be equal to the task of designing it, although the borough surveyor may have spent months in preparing a set of plans and estimates at the request of the committee. The successful Mr. Jones, of London, who has erected such a building somewhere, is spoken of; but as a matter of fact, Mr. Jones may be anything but a master of the problem. What he may have done in Leeds or Newcastle successfully is no guarantee that he could do the same thing well in a South of England town. Competition is decided upon—an almost ironical and provoking way of bringing together irreconcilable ideas and persons. The Southerner is brought to the North, and finds all his predispositions dashed to the ground, his notions of style and arrangement ridiculed. The specialist finds also his mode of construction or type of plan equally undervalued by a committee who have an open mind for all systems. The "Queen Anne" expert discovers his studies of quaintness and grotesque detail thrown away in a place where the most uncompromising Classicism exists; and so, also, we often see that an architect from the South specifies a soft limestone for a building in a manufacturing town, where the atmosphere would soon destroy it. These and other conflicting accidents of inviting men to compete from all parts for a local building are unsatisfactory at the best. Perhaps it is worse to employ a London assessor, unassisted by any local architect of repute, who can only fairly judge of the provincial work. Anyhow, it is very exasperating to Mr. Simpkins, the residential practitioner, who prepared designs on his own responsibility, and has given the building committee valuable information, looking forward to the commission himself as a reward for his trouble, that he is thrown aside and his information made use of by the committee, who now invite an open contest. What are his chances?

The London practitioner affects a certain *hauteur* which is often displeasing, if not irritating, to the provincial, however much the latter may be his superior in practical attainments. That there is some reason for the imagined superiority of the metropolitan cannot be disputed; he is supposed to practise amongst the *élite* of the profession, to be in touch with the centres of professional life and work, to be resident in the capital. Not that he has done anything to distinguish himself in London; he may have carried out

nothing but a vestry hall or Metropolitan asylum. When he luckily obtains the first prize for a building in a certain town, he has little to trouble himself about. The building is entrusted to a local contractor or clerk of works, who is employed to superintend the work, and who takes all the responsibility and labour, measures up the work at intervals, makes all the necessary detail drawings, selects the materials, and does everything except grant the certificates; while the successful competitor runs down once a month or fortnight, and draws his commission for casting his eye over the work. Of course, he gives any instructions he has to impart to the clerk of works, explains how he wants this or that done, the real difficulty of which he leaves to his local coadjutor to carry out as he thinks best, writes out the certificates, and signs any orders for extras. We have known of important churches, public offices, and provincial hotels being practically carried out from the direction, and under the superintendence, of clerks of works, who have supplied the necessary details, negotiated the business with tradesmen, and without receiving more than half-a-dozen visits from the London architect. We do not think for a moment that there is anything wrong or unusual about this when promoters accept an architect's design and are willing to pay him for his skill or experience. They know, or ought to know, whether it is possible to obtain the same talent in the locality. Nor can they expect an architect to visit a work two hundred miles away as often as it should be, or as it might be, visited by a local practitioner. We hardly blame the profession for a state of things which, however much to be regretted, cannot be avoided. The public prefer to have a London architect's design, and are willing to pay for it on the best terms they can.

The provincial practitioner very naturally rebukes this mistrust in his capabilities. He knows the site better than a stranger, is familiar with the local materials and labour, is an adept at measuring up work, and can give more of his time to supervision and practical details. His art may not be of the highest type: generally he betrays provincialism of style; but his design is at least practicable, which is not always the case with the outsider's, and is more likely to be carried out in its integrity at a less cost. But these are virtues which are not appreciated till they force themselves on the mind after the work is completed. It is seen too late that mistakes have been made in the building. Certain arrangements which only local custom and experience have found necessary are wanting; the attractive and highly ornamental elevations which won the admiration of the public have now dwindled down to one façade, which disappoints, and that has been "cut down" so much that only a phantom of its former representation remains; the other sides of the building are of the plainest and barest description. Not only has the ornamentation been stinted, but the material has been reduced in cost by the substitution of a poor stone for the one intended to be used. We are drawing no exaggerated picture of buildings erected from designs of London architects which have to be curtailed of their expensive features. Most of our large towns will furnish examples of emasculated work in which the contractor has had a free hand, while the hand of the architect is scarcely seen. To the artist's vision in the competition perspective, the building bears the faintest resemblance.

Unfortunately, the dodging, dishonest contractor has a particular liking for work which is not under provincial superintendence. He has a better opportunity of running up his walls with "shuffs" and bats in inferior mortar, of scamping his timbering and wood-work, and cutting down details, than if a local architect was employed. Besides, he

may never have again to do work for the same architect, and knows that it is better to keep in favour with the local men than with strangers. The usual competition condition that the successful author is to be employed to carry out the work is not always given, or accepted, in the true spirit; the committee inserts it as one way of reducing the premium to be paid, the competitor regards it as a mere bait, as he knows that the actual superintendence will be entrusted to the clerk of works, who will relieve him of any anxiety, and will furnish him with a loophole of escape, if the design, which is under-estimated, does not come out to the satisfaction of his employers.

The employment of London architects for provincial work has no doubt another disadvantage: it rather favours the centralising tendency which places the art under the ægis of the few and favoured. London assessors and arbitrators and referees make it harder for the provincial to get that standing in the profession he desires. He not only sees his more important buildings given to London men, but has to bear the indignity of finding a president or ex-president of the R.I.B.A. recommended as arbitrator or referee in a local contract dispute, or a London man named in preference to himself in a limited competition. All this is very galling, and in some circumstances unfair. Then it will be admitted that when provincial men are supplanted by Londoners local interests suffer in consequence. It is only by the assertion of provincial employment that local manufactures, materials, and labour obtain recognition. These are matters which deserve attention. The London practitioner knows nothing, and cares less very often, about any special material or mode of construction which prevails in the little town of Bolton-le-Sands, although the cost of the particular building may depend largely on the circumstance. London and provincial practice differ much in other points. If we take the matter of training, we shall find that the youth in the London office works more in a groove than his brother student in a country town; more routine is learned about a certain class of buildings; he has more facilities for drawing and details on paper, but, on the whole, his training is essentially that of the mere office. The provincial youth has a larger field open to him: he visits buildings in progress oftener; he takes some interest in the builder's workshop, to which he has more frequent access; he accompanies his principal occasionally, and assists him in preparing quantities, writing specifications, making surveys for a variety of purposes. As to questions of practice and contract work, the country practitioner must be acknowledged to have had a more varied experience, for his very training has given him more frequent opportunities. Who will deny to him superior attainments in the surveyor's branch of the profession? In estimating, quantities, measuring work, valuations, and dilapidations he is unquestionably ahead of his London rival. He is probably a better business man, for he has no doubt had something to do with local authorities. What he lacks is in what may be called the disciplinary part of his profession, in the advantages of architectural study, which London and the larger towns only can give. The artistic impulses and instincts, even if strong in him, have been dwarfed or cramped by inadequate facilities for seeing good models; he has seen only details which are imperfect, and his art-perception has been accordingly stunted. When he comes to London he discovers that his notions of what is good and bad in design are wanting, and he quickly rejects his provincial ideas for others which are more up-to-date. Prejudice in design grows apace in a provincial town. Without aids to study by schools or good provincial examples and societies, the young practitioner imbibes a narrow spirit and cramped



style, which his London *confrère* avoids. This narrowness is noticed in other matters. We find the provincial less disposed than his rival to quietly accept defeat. In competitions, we know, he is particularly combative, self-opiniated about the merits of his design, and takes disappointment with bad grace, and he wonders sometimes how complacently the Londoner submits, how quickly he recovers his wonted composure. But local feeling naturally runs high in architecture as in politics; it always will be so. It will be admitted the provincial has more sincerity than his distant competitor; he enters more sensibly and closely into the problems that come before him, and it will be a misfortune for our national architecture if, through want of discipline and educational facilities, the provincial standard is not maintained. Many of our larger towns have shown that they possess men capable of making a mark in their profession when opportunity occurs. They, at least, look for a fair tribunal, which cannot be secured when only one assessor, and he generally a London architect, is selected.

### ONE-SIDED CONTRACTS.

**R**ESPONSIBLE and well-informed builders naturally object to sign contracts of an unreasonable kind. Nothing, on the other hand, will deter the evasive and dishonestly-inclined contractor. He does not trouble about documents of any kind; he is content to sign the most rigidly-framed contract, because he knows very well that he means to wriggle out of it at all costs. No clause will hold him. It is this distinction between the contractor who intends to be honest and to carry out his covenants and the man who means to evade his responsibilities that has to be borne in mind. To the honest man, an unreasonable and one-sided set of building conditions is naturally repugnant and resented; while in the case of the evasive builder, no advantage is gained by the stringency of the conditions, but they rather, by their over-drawn demands, defeat their intention. Several clauses in ordinary conditions of building contracts are open to the objections of builders. One of the stereotyped phrases in them runs that certain work is to be done "in the best manner." Now, this expression may mean in various manners, according to the standard demanded. The tradesman may have one idea of "best," the builder another, and the architect a third. The contractor may reasonably think he has executed the brickwork in the best manner compatible for the particular purpose; but the employer or his architect may consider it in a different light, as being not the best. Now the question arises, Which is the right view? Is there any standard of excellence by which the work is to be tested? A large number of disputes turn on this point in building. Mr. A. A. Hudson—one of the three members of the Tribunal of Appeal under the London Building Act—said, the other day, at the Surveyors' Institution, in a paper we reported, that the phrase in question was too vague, and we must agree with him. Generally, as our readers know, the work is to be done to "the satisfaction of the architect," whose decision is to be final; but if he is exacting, the builder refuses to comply with his demands. As the architect is biassed to some extent in favour of his client, he is likely to ask too much. But the Courts have decided that if there is an absence of fraud or dishonesty, the architect's decision is to be final. "The effect of such a condition, that is, of the satisfaction of a third party—the architect or engineer in fact—is," as pointed out by Mr. Hudson, "that the standard of excellence is the mind of the architect or engineer, and it does not affect that standard, even if other descriptions are added, such as 'best' or 'second best.'" Under ordinary

contracts this condition works fairly well; but there are instances where it does not. The builder takes exception to the architect's judgment if he does not get his certificate. The word "best" leads to endless disputes if standing alone; but in addition to the "satisfaction of the architect," it may be useful. But the latter term is quite as disputable. Many builders do not like to commit themselves to the condition that they are to do work to the "satisfaction of the architect"; but only to his reasonable satisfaction. But whichever way we consider the question—whether the standard of excellence is described by the term "best," or the "satisfaction" of the employer, or to the "satisfaction of the architect," the same principle is involved—the mutual understanding of the parties as to what is good or satisfactory, about which there may be endless disputes. We can imagine a building in which certain things are not executed with the skill or care the architect required. Certain woodwork may not be of the best according to specification, though the work as a whole may be reasonably satisfactory; or there may be an inferior class of fastenings or furniture on certain windows and doors. Would it be reasonable to withhold a certificate for these defects? Or again, would it be reasonable to refuse to pass a piece of framing because the panelling is not exactly according to the drawing, or the mouldings are different? There are certain limitations within which such departures from the specification or drawings may go. A builder may accept the architect's decision as final in some things, but not in others, and it is obviously very difficult to make architect and builder think exactly alike.

Other conditions, more or less depending on approval, are those regarding payment. Few builders agree that because the architect does not approve of the work, that in consequence they are not to be paid; or that the architect, for some alleged default, is to carry out the work at the builder's expense. The rejection of inferior materials is another condition which often leads to disagreement. Who is to be judge of quality in stone or timber for example? Sometimes the architect may require a certain stone which cannot be obtained; or a specified kind of timber, that is really not better than the brand supplied. In these and other cases, the arbitration clause is the only reasonable means the builder has of obtaining justice; and we cannot be surprised if builders are anxious to obtain a clause, the wording of which is satisfactory. The usual contract generally lays down the condition that the builder is to be paid only on the certificate of the architect. Builders naturally enough object to this clause, and the Association which represents their interests supports them in this contention. Mr. Hudson suggests that the quantity surveyor is a proper person to measure and value for advances and certify the amounts due, and that he should be jointly employed by the employer and builder and be paid half by one and half by the other. The profession may have something to say upon this suggestion; but we take it that a large number of architects who conscientiously object to have anything to do with the details of quantities and prices, will acquiesce in the proposition, if only because it will relieve them of any responsibility to their clients for mistakes in quantities and for advances to the builder.

### COUNTY LUNATIC ASYLUMS.—XL.

By GEORGE H. BIBBY, F.R.I.B.A.

DISTRICT ASYLUMS AT HOME AND ABROAD.

**T**HE whole of the buildings forming the asylum at Halle, of which I gave a block-plan on Fig. 62 in my last paper, are surrounded by pleasure grounds; the paths in these are partly

paved and partly gravelled, and at the rear of the last row of houses there is an area of rather more than half an acre of land, which is utilised for the employment of the patients upon garden work.

All the buildings are erected with ornamental bricks, and in their application the plainest forms of the Gothic style have been adopted. The main buildings, with their one-story wings on either side (see Fig. 63), are constructed of bricks of a yellowish-brown hue, enlivened by courses of dark-coloured bricks. Up to the plinths the buildings are, for the most part, constructed in stonework, but portions are faced with red brick. The roofing is slated upon asphalted felt, the pitch being about 1 in 4, the roofs of the main buildings and the chapel being somewhat steeper. The staircases throughout are of granite.

The buildings are inclosed on three sides by a brick wall about 7 ft. in height, but the frontage to the street is separated therefrom by wrought-iron fencing, sunk into stone copings.

This asylum, which was erected in the year 1891, was prepared to receive 110 mental sufferers divided into four classes—that is to say, 11 first-class patients, 6 second-class, 73 third-class, and 20 patients suffering from nervous forms of mental disease; and the cost is stated to have been about 665,000 marks.

The main building in the centre (Fig. 63) contains in the basement, 9 ft. in height, the rooms of the porter, the messroom of the physicians of the institution, the remaining area being occupied by mechanics' shops, engine and dynamo-rooms, heating chambers, air channels, and connecting tunnels, &c.

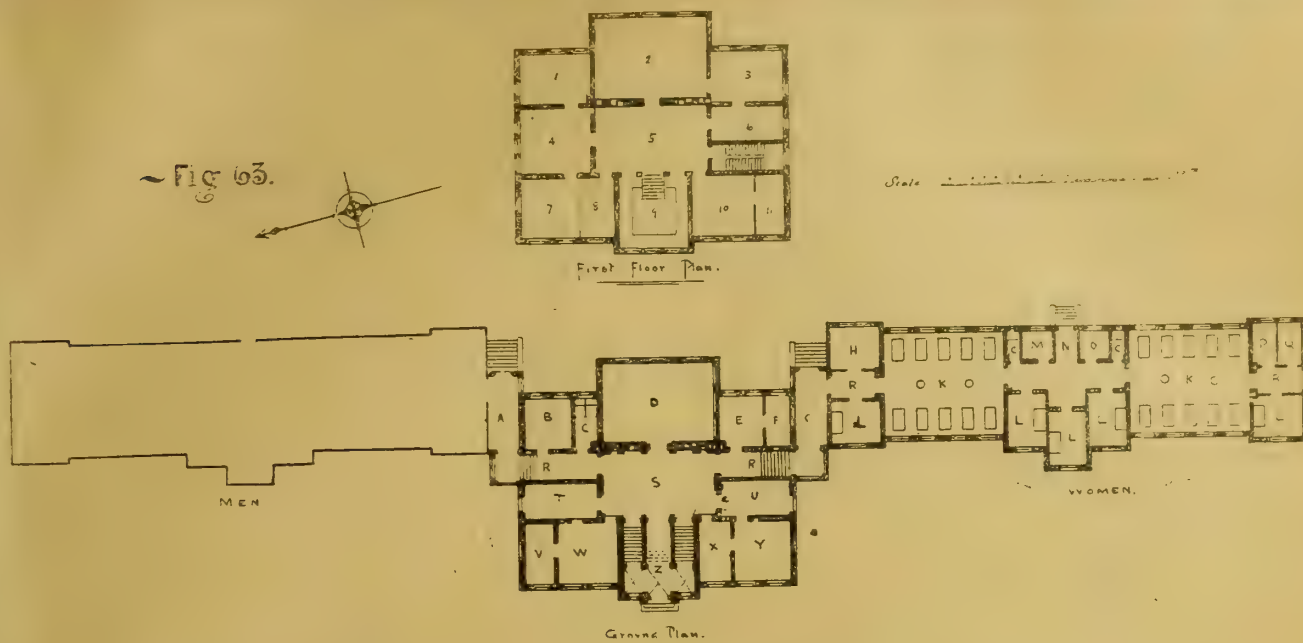
The ground-floor rooms above these (see Fig. 63) are about 14 ft. in height, and contain the hall, at S, and principal entrance at Z, which receives light from all four sides, and can be heated. On the right-hand side of the entrance is an ante-room at X; two call-rooms for outdoor patients are provided at U and Y, the sexes being separated.

With regard to out-door patients in mental diseases, it may here be remarked that the German asylum authorities appear to be somewhat in advance of those in this country. Sir Andrew Clark, Dr. Stephen Mackenzie, Dr. Quain, and Dr. Batty Tuke have all expressed themselves in favour of the formation of out-door departments in connection with hospitals for the insane and upon various grounds, it being stated that it would be pre-eminently desirable to have an opportunity of bringing more frequently before medical men those earlier aspects of disordered states of mind which might or might not result in insanity. Out-patients would include many persons not looked after or understood by their friends, and who might, under well-managed out-door guidance, obtain much benefit. And further, such an out-door department might often be of use to patients who, though discharged, are occasionally liable to exhibit incipient signs of a return of their malady.

The London County Council has, as I have already pointed out, the custody of a larger number of insane persons than any other authority in the world, and so far back as 1890 appointed a committee to report as to the advisability of forming a hospital for the insane, and this committee stated: "An element of great importance, in determining the question of site, is whether it is desirable to establish in connection with the hospital an out-patient department. The committee are not prepared to recommend that this should be done in the first instance, or until a certain amount of practical experience has been gained in the management of the proposed institution, but are quite clear that it should be kept in mind as an eventual development, and that it should be brought into operation at the earliest possible time. The evidence is complete with regard to the existence of large classes of cases in which the patients could not be called insane, and in which they could not be subjected to any legal restraint; but in which their friends, and sometimes even themselves, are perfectly conscious of eccentricities or of deviations from a healthy standard of thought, which, if taken in time, might be cured before more serious symptoms or conditions had displayed themselves." Such a department, upon a moderate scale, has been in operation in connection with the new town dispensary of Edinburgh, under the direction of Dr. Batty Tuke; but I am not aware of any other institution in this country where out-patients have been treated for mental diseases; but in the German asylum at Halle the out-patients are provided with rooms specially placed for the purpose in the entrance



Fig 63.



block, and near to the physician's rooms at EF (Fig. 63).

On the ground plan, shown in Fig. 63 at T, the reception-room is arranged so as to be also used as a waiting-room for the inspector, whose office is at W, the treasury being at V, and the lecture-room at D. Above this on the first floor (2 in Fig. 63) is another lecture-room to accommodate 72 auditors, fitted with an apparatus for throwing illustrations upon a screen.

On the first floor is also an ante-room for the director at 3 (Fig. 63), and at 1, 4, 7 are rooms for the chemical, microscopical, and other scientific investigations and for various collections. The library is at 8, while the assistant medical officer of the asylum has 10 and 11 (see Fig. 63) as his private quarters. The smaller stairs shown is of iron, and merely leads to store and box rooms in the roof.

The wings on each side are of one story only, and contain, each, two day dormitories at KK for 10 patients, and five single rooms at LLLLL, the accommodation in each wing, therefore, being for 25 patients. The two large rooms are connected by a corridor, lighted by a glass-covered lantern-light. The wards are provided with bath-rooms at MO, closets at CC, also wardrobe, scullery, and lavatory for patients, &c.

Only small portions of each wing are under-celled; the remaining parts have the ground floor raised about one yard above a paved area, thus allowing free passage of air below the floors.

The flooring of the single and the large rooms is done in oak, the bath-rooms, closets, and sculleries being paved with earthenware; the remainder in pine, and the walls are painted in oil-colour.

The windows are not barred or fenced off, but are made with an arrangement that precludes any easy opportunities of escape; this is shown on Fig. 64. Here it will be observed that if the side lights be made only moderately narrow, that when these are opened, less than half of the width of the lights would become available as a means for the escape of patients; while, at the same time, the views from the windows would be less prison-like than by other means of securing the safety of the patients. The medical officer of the Halle Asylum, Professor Hitzig, very strongly urges that all windows, while providing proper security, shall be so arranged that the patients may not imagine themselves to be in a penitentiary, and thereby have their prospects of recovery frustrated. He also points out the great advantage of keeping most of the patients upon the ground floor, especially those who may be of suicidal tendencies.

All new patients, unless noisy or dangerous, are put into the large room of the two front wings, shown on Fig. 63, or into single rooms if only moderately troublesome in these respects. The worst cases are taken into one of the buildings at the rear, which are isolated for the purpose. These two wings also serve at the same time as a training-school for the attendants of the asylum, no person being there employed

who has been formerly engaged in asylums or hospitals.

At the rear of the main building and its two wings are two villas for patients, between which is placed a third detached building containing the kitchen, sculleries, and washhouse, the latter (as in English asylums) with a foul wash-room, and drying-horses in heated closets.

The detached villas have basement, ground and first floors, with a few rooms in the roof space; the ground floor contains a large room 37ft. by 19ft., divided by sliding doors into two equal parts, one being used as a day-room, and the other as a dining-room for 21 patients. Around

Fig 64.



this room are grouped a number of bedrooms with southern or eastern aspects, and with accommodation for from one to six patients each.

The two isolation houses are yet further from the front buildings, and are each arranged for five beds for the very noisy and raving. The accommodation is of a simple nature, the bedrooms, bath-room, and observation-room all leading directly into a large day-room.

Between the isolation houses is a detached building for boilers, engines, &c., and beyond this a building combining the various purposes of a mortuary and post-mortem room, which is connected with the asylum chapel, the whole arrangement being shown in Fig. 62 in my last paper.

Asylums of more or less importance exist in considerable numbers in Germany. Some two or three years since the London County Council had occasion to obtain information respecting

certain asylum details, and applied to the authorities in Austro-Hungary, Belgium, Denmark, France, Germany, Holland, Italy, Norway, Portugal, Russia, Spain, Sweden, Switzerland, and the United States of America. The German asylum authorities sent no less than about 40 replies relating to as many German asylums. Numerous replies were sent from other countries; but it would appear that the subject of lunatic asylum work, upon the whole, is better understood in Germany and the British possessions than elsewhere.

The system, which has been observed at Halle, of placing noisy and violent patients in detached buildings, is by no means a new one in Germany, where asylums in many respects appear for a considerable period to have approached nearer in their construction to those in England than to those erected in France.

German asylums erected about the year 1845 were frequently arranged in one or several central buildings of two or three stories in height; the common rooms, the offices, chapel, kitchen, wash-houses, store-rooms of the officials were all together. From these one or two-storied side wings were extended, either in direct communication or detached. In these were placed the different divisions of patients, and as a complement to the system were small single-storied buildings (as far as practicable removed from the centre), which contained the apartments for unruly patients. It was not unusual with asylums in those times for each division of the institution to have its own garden and pleasure-courts for its inmates. The French asylums, on the contrary, were then constructed upon quite a different principle, and this was particularly noticeable in those designed upon Esquirol's plans, which consisted of a series of square houses, widely separated, of merely a ground floor containing a number of single rooms (possibly at that time constructed as mere cells), a common day-room, work-room, &c., with a colonnade around, and, inclosed in the centre, a plot of grass. Several rows of such single-storied squares were connected by those colonnades, including the storehouses, work-room, chapel, bath-houses, and other portions. This mass of distinct buildings, which sometimes occupied an immense area, was not only more costly to erect, but rendered the oversight more difficult, and afforded fewer facilities for visiting the more distant parts of the institution or for superintendence; but in the construction of later asylums in France, these modes of designing asylums appear to have been considerably deviated from.

(To be continued.)

#### THE POSITION OF PROVINCIAL AUCTIONEERS.

AT the monthly meeting of the Auctioneers' Institute of the United Kingdom, held last night at 63, Chancery-lane, Mr. Frank Everill, of Worcester, president for the year, in the chair, a paper was read by Mr. John Hepper, of Leeds,



on "Provincial Auctioneers: their Position, Practice, and Prospects."

The author remarked that forty or fifty years ago it was a common thing for provincial auctioneers to have the conduct of furnishing, undertaking, agency, farming, or other businesses, which assisted them to an income which the auction department supplemented. In many parts of the country this combination still existed. Few auctioneers then possessed really good rooms, and he did not remember any in Yorkshire which, forty years ago, had been built for the purpose. Forty years ago provincial auctioneers were seldom engaged to value, or advise upon the sale of real estate, or to take any part in arbitrations, land surveys having the work all to themselves, and the advertisements and particulars being prepared by the solicitors or their clerks. In those days there was very little professional literature to assist a thinking auctioneer, and he had to work out methods of valuing and schemes of business for himself. What was the present position of the provincial auctioneer? Socially, much higher. The business position had also been altered in towns and districts affording sufficient employment for able men. Now the principal auctioneers in Leeds prepared estate advertisements and particulars of sale, suggested special conditions, valued for reserve prices most of the property they offered, and valued largely for transfers and mortgages, besides acting as umpires, arbitrators, and witnesses in arbitrations, duties which in 1851 they rarely ever discharged. When railway facilities were not so numerous, it was a common thing for those auctioneers who could command suitable promises to receive and sell consignments of pictures and all kinds of art property, as well as stocks of a more utilitarian character, not only of English but also of Continental and Oriental production. The more travelled habits of the people, new methods of distribution arising out of the competition of producers, merchants, and dealers, the introduction of local spring and winter exhibitions of pictures by the municipalities and other bodies, and the growth of the "stores" system of trading, had greatly diminished this class of auction business. Formerly, under the old bankruptcy laws, trade stocks and plant were disposed of chiefly by the auctioneers, but now they were to a large extent dealt with by accountants acting as trustees, who sold all they could by tender or otherwise. But, on the other hand, branches of business which had been regarded as incidents or accessories were fostered, and in them new experience was gained, with the result that now the business of a successful firm was either more varied and in the hands of two or more partners, or had become so special that the principals were looked upon as experts in their particular lines, and their business extended far beyond their own town and neighbourhood. There were indications of a large extension of business in the real estate market, arising from the altering conditions of society, which would probably lead to the breaking-up of large estates, and the division of smaller ones into holdings which men of very moderate means might purchase. Properties would probably not remain in the hands of families for several succeeding generations so frequently as in the past, and consequently there would be more dealings with them, and a larger aggregate of transactions yearly than they had been accustomed to. The lessening of the costs or of the delays and difficulties of transfer would continually engage the attention of Parliament until some feasible scheme was arrived at which would give greater freedom of dealing with land than was found under the present system. The prospects of auctioneers were satisfactory, and the realisation of their legitimate ambition rested with themselves. But, to further this realisation, what were their needs? In the first place, organisation and affiliation to a central body—the Auctioneers' Institute. They needed some better method of admitting men to the responsible position of an auctioneer than the present ridiculous system. A practical training should form the basis of admission to the rostrum; but if that could not be attained, a system might be established of graduated licenses. Auctioneers needed a method by which their ranks should not be liable to be recruited by those who possessed neither knowledge, manners, character, nor cash, but who might borrow or have subscribed £10, in return for which the Inland Revenue authorities would hand him a license bearing the Royal Arms, dub him auctioneer and valuer, and turn him loose upon

society to make probate valuations, conduct mock auctions, or do any other work which he could obtain or manufacture. One step towards the end in view was to make the Council thoroughly representative, not by self-election, but by the direct selection and election of members themselves, so that each member of the Council was directly accountable to the whole Institute, and in proportion to his usefulness would be the amount of confidence and support he received.

Mr. Catling, of Cambridge, said there was too much unfair competition amongst auctioneers. Formerly they got 2½ per cent., which was not at all excessive; but now they had to put up with 1½ per cent.

Mr. Hamilton, of Leeds, Mr. Jamieson, of Putney, Mr. Pennington, of Richmond, Mr. Johnson, of London, Mr. W. R. Peck (Hampton and Sons), Mr. E. Dobson, of Bradford, and Mr. A. G. Dille, of Huntingdon, also addressed the meeting briefly.

On the motion of Mr. J. F. Field (London), seconded by Mr. J. Stower (Farebrother, Ellis, and Co.), a vote of thanks was passed to Mr. Hepper for his address.

## CONCRETE CONSTRUCTION.\*

(Concluded from page 274.)

IN calculating the strength necessary for a floor with all its edges fixed, it must be remembered that a square slab is 100 per cent. stronger than a beam with only two opposite edges fixed. With small rods, also in floors, they can be laid in both directions, which is a decided advantage; but as so often happens, practice and theory do not quite fit, especially as the cheapest contractor generally gets the work to carry out, and "hurry up" is the order of the day. It is obvious that with wide spans and small rods it would be unsafe to withdraw the centring before the concrete is quite hard and dry. It is better, therefore (as in so many other cases), to compromise matters and use joists, or bars on edge, that have a considerable carrying power, but to use these as small as possible in order to get the most satisfactory results. These bars, when threaded with twisted, square ½ in. rods, give a very strong floor. We cannot always stand over our workmen, so cannot always guarantee perfect adhesion for this reason, and to obviate the slip between iron and concrete I am using ½ in. square bars twisted, which, like the screw, cannot be pulled out. The I joists or T irons one way, and the twisted bars the other, make a strong and serviceable floor, and I have made some floors 40 ft. long and 28 ft. span and 9 in. thick on this principle without any girders whatever under the floor. The variety of local materials, the quality of the cement, and the incompetence and indifference of workpeople, necessitate a great margin for safety. We generally recommend 6 as the factor. You will no doubt expect me, after giving you so much dry detail, to give you some simple formula for calculating the strength of these floors. The simplest one, and the one that approaches the nearest to the actual results, is as follows:—Multiply 12 in., which represents a foot of the floor, by the square of the depth in inches, and the product divided by the square of the span in feet will give you the safe load per supl. foot in cwt. Take, as an example, a floor with a span of 10 ft., and 6 in. thick. Then,  $\frac{12 \text{ in.} \times 6^2}{10 \times 10} = 4.32 \text{ cwt. per supl. foot safe load.}$  Take another 20 ft. span by 8 in. thick. Then  $\frac{12 \times 8^2}{20 \times 20} = \frac{768}{400} = 1.92 \text{ cwt. per supl. foot safe load.}$  This formula is for best quality floors, and with 1-60th sectional area in steel or iron. A floor 14 ft. square and 6 in. thick, 4 to 1, supported around the edges, was actually made and tested by Col. Seddon, and gave way under a distributed load of 10 tons. Had this floor been made as I suggested, it would have carried safely over 20 tons, and would not have broken down under 135 tons. We learn by our failures, but in 23 years I have rarely had an opportunity of seeing floors broken down. Some years ago, we were constructing four very large floors, one above another, to carry very light loads, 1,000 yards in each floor, when an accident was reported. It turned out that

some large tanks were to be erected at one end of the building, and the engineer had bribed our man to remove his centring too soon, the floor had collapsed, and the consequent thrust had sheared the bolts at the base of the columns. In consequence of this, the architect was very nervous about their strength, and tested them with gravel. They were very light; the girders were placed 11 ft. apart, and there were no cross-girders or ties of any sort, and the concrete was only 4 ½ in. thick at the crown of the arch, and 11 in. at the haunch. Very many of the bays were weighted, and one cracked at the centre the whole length with 2 cwt. per superficial foot. The few other failures I have had have been where the floors have had only the rough concrete laid, and open to winter's storms and snows, after the centring has been removed. These saturated and very much weakened the concrete. I know very well that solid concrete floors should be laid on walls when they are at the height to receive them, and that the walls should then be built upon them, in order to get the greatest possible strength, and if we were allowed to put the finishing coat on, which is also waterproof, I see no objection to this practice, except that the architects fear that damage may be done to the work by falling bricks, &c.; but if, as is the general practice, only the rough concrete is allowed to be put down, great risk is run, especially in the winter time. If possible, the scaffolding, or centring as we will call it, should be allowed to remain 28 days. I do not approve of the very common method of slinging this centring from the iron girders, as the ceilings are invariably out of level, and a thick coat of plaster is necessary, which is very objectionable. It is best to employ a skimming of Portland cement and washed puglime (as it is the most adhesive) where the colour is not important, and a thin skimming of Keene's cement for the best finish. Dovetail blocks for fixing floors to are a source of weakness as well as expense, and flooring-boards may just as well be nailed to loose flat fillets laid on the top of the concrete, for they cannot shift. We are sometimes very awkwardly situated about centring, no scaffolding being allowed for more than 24 hours. I have had to cast cantilever girders with very wide flanges and keyed at the centre, and once at Edinburgh University I used 2 in. of fibrous plaster on a temporary centre, imbedding half bricks as arches on the soft stuff, and on this rammed the concrete, thus leaving a finished arched ceiling. Recently I have erected in Mr. Barker's new premises, Westgate-road, a winding staircase in elliptical well. I formed the centring for the soffit roughly in wood, and on this laid a coating of four of sand to one of plaster to the true lines, and on this formed the staircase, the result being a very true and perfect soffit.

Stairs are now frequently made of concrete—not in single steps, but in one mass. Rods of iron are laid in the steps, and flat bars or wire ropes laid in the soffit. These are fastened or threaded through similar bars or joists in the landing, the result being a staircase of extraordinary strength, and one that will not utterly collapse except in a very severe fire. Chases are cut in the walls to receive the sides of steps. The durability of these steps is remarkable; but, unfortunately, when made of the hardest material they are very slippery, in time getting as smooth as glass. There are many ways of getting over this difficulty, the simplest plan being the use of limestone instead of granite for the face and running a grooved roller the length of the step, ribbing it for about 6 in. of the tread. Treads can be formed with Hawksley's wood blocks and various metals, or Doulton silicon treads. In one instance—viz., the escape staircase of the Tynce Theatre—I used teak blocks on edge fixed in the concrete. It was very successful, but a few of the blocks are loose; they are 1 ½ in. square and only 1 in. in depth. Another time I will have them 1 ½ in. deep. Great care has to be exercised in forming the reverse of the stair in wood, so as to have the mitres of the nosings, stringcourses, and well corners true. An example of an elliptical stair—a most difficult piece of joinerwork—may be seen at the Imperial Buildings, Westgate-road, and one built with marble and concrete at the Station Hotel. I do not think concrete steps are much cheaper than stone in this district, but I cannot understand why concrete landings are not oftener specified. They are very much cheaper, are ten times as strong as stone, and the larger they are the cheaper in proportion. I don't think I am exaggerated at all when I say that concrete staircases are ten times as strong as stone. Test con-

\* A lecture delivered by Mr. PHILIP HOBBS (Managing Director of W. B. Wilkinson and Co., Ltd.) at a meeting of the Northern Architectural Association in the Art Gallery, Newcastle-on-Tyne, Feb. 12, 1896.



REPORT OF TRANSVERSE TESTS OF BEAMS COMPOSED OF CONCRETE AND STEEL BARS COMBINED. (Received from Messrs. W. B. Wilkinson and Co. Ltd., Newcastle-on-Tyne, Feb. 3, 1896. Each beam was supported at the ends 5ft. apart, and the load was applied in the centre).

No. of Test.	Overall breadth (inches).	Overall depth (inches).	Steel bars.	Deflection in inches at the centre with a load as follows in tons.										Breaking load tons.	Remarks.
				1½	2	2½	3	3½	4	5	6	7	8		
1	6	6	Five bars, ½in. square, twisted	·015	·031	·062	—	—	—	—	—	—	—	2·75	Web sheared diagonally towards one end.
2	6	6	Ditto	·013	·062	·093	—	—	—	—	—	—	—	2·85	Web sheared nearly straight.
3	4	6	One beam, ¾in. by 1½in. by 4lb. per ft.	·032	·063	·09	·125	·156	—	—	—	—	—	4·0	Concrete cracked on bottom edge. Steel beam oiled.
4	4	6	Ditto	—	·032	·062	·09	·125	·187	—	—	—	—	4·5	Concrete cracked on bottom edge. Steel beam oiled.
5	4	6	Ditto	·031	·063	·09	·156	·19	—	—	—	—	—	3·85	Concrete cracked on bottom edge; split by shearing and partly by compression on top edge.
6	4	6	Ditto	·031	·063	·09	·125	·16	—	—	—	—	—	4·0	Concrete cracked on bottom edge.
7	4	6	Ditto	·031	·063	·09	·12	·15	—	—	—	—	—	4·0	Ditto Ditto.
8	4	6	One bar, 1½in. by 1½in. by ¾in.	·031	·125	·18	—	—	—	—	—	—	—	2·9	Concrete cracked on bottom edge and also sheared.
9	6	8	One beam, 4in. by 1½in. by 8lb. per ft.	—	·031	—	·062	—	—	·093	·125	·187	·25	8·5	Concrete cracked on bottom edge.

NOTE.—In Nos. 3, 4, 5, 6, 7, 8 the steel beams were below the neutral axis. In No. 9 the beam was in the centre of concrete. The breaking load of the steel beam by itself in Nos. 3, 4, 5, 6, 7 was 2 tons in the centre; in No. 9 it was 3·6 tons in the centre.

crete with stone, the concrete is always the stronger; and when tied judiciously with iron and laid in one homogeneous mass—to say nothing of the adhesion to the wall and the perfect fit—it must be many times more substantial than single steps of stone hanging from the wall. Nevertheless, architects have so little faith in concrete that they insist on the concrete being much thicker in the soffit than with the material they are more familiar with.

I do not recommend concrete for roofs. It is too heavy a material, is liable to contract, and, unless covered with something to prevent the extremes of temperature and wet and dry weather affecting it, is apt to prove anything but watertight. With 6in. of earth, or covered with water, or a layer of asphalt, it will last for ever. Concrete is, however, a very convenient material and very strong for a flat roof, and the necessary falls

TABLE SHOWING THE THICKNESS OF CONCRETE NECESSARY FOR FLOORS made with machine-crushed firebrick and scoria, and mixed 4 to 1 of Portland cement, all but the top inch, which must be 2 to 1, and 1/10 the sectional area of iron on steel in the lower half of the concrete, 2/3 of it being in the direction of the shortest bearing, and 1/3 the breaking weight in addition to weight of floor.)

Safe distributed load in cwt. per superficial foot of floor, giving a factor of safety of 6.

Span in feet...	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
4in. ....	12·0	9·6	5·2	3·9	3·0	2·3	1·9	1·5	1·33	1·1	—	—	—	—	—	—	—
5in. ....	18·8	12·0	8·3	6·1	4·6	3·7	3·0	2·3	2·0	1·8	1·5	1·3	1·1	—	—	—	—
6in. ....	27·0	17·2	12·0	8·8	6·7	5·2	4·3	3·5	3·0	2·5	2·2	1·9	1·7	1·5	1·3	1·1	1·0
7in. ....	36·7	23·5	17·3	12·0	9·2	7·2	5·8	4·8	4·0	3·4	3·0	2·6	2·2	2·0	1·8	1·6	1·4
8in. ....	48·0	30·1	21·3	15·6	12·0	9·4	7·6	6·3	5·2	4·5	3·9	3·4	3·0	2·6	2·3	2·1	1·9
9in. ....	60·7	38·8	27·0	19·8	15·1	12·0	9·2	8·0	6·7	5·7	4·9	4·3	3·7	3·3	3·0	2·6	2·4

and gutters can readily be formed in it. Care should be taken to provide for a slight movement through expansion and contraction, and very fine cement should be used, so as to avoid as much as possible the minute cracks caused by the slaking of the coarse particles of free lime or calcium oxide into the more bulky hydrate of lime.

Domes can be made of any size in concrete. My usual plan is to cut wooden ribs to the sweep required, lath them, and coat with plaster and sand. On this lay the concrete, interlacing it with small iron rods, vertically and horizontally. A panelled or groined roof can easily be formed in this way.

Concrete is now largely used for floors and walls of reservoirs and baths, and if care is exercised in the construction, there is no fear of their not being watertight. Small iron rods should be used in the rough concrete at the bottom and the backs of walls, and wire rope for strengthening the angles. The walls and floors should then be carefully lined with a rich cement previous to the tiling. Twice last year I was consulted about two swimming-baths leaking where the sides and bottom were lined with glazed bricks, and in each case I found the bricks had been set with cement mixed with a very large proportion of sand, and laid on to and against very poor concrete, which, although of great thickness, was a perfect filter.

Very few bridges have been made in concrete in this country, engineers and surveyors not having sufficient confidence in the material; but I should have no hesitation in undertaking 30ft. spans, with flat ceilings, over a double line of rails, a design for which I have on the table. I mentioned just now some flat ceiling, 40ft. long by 28ft. wide, and 9in. thick, without any girders underneath, but interlaced with 4in. joists and ¾in. rods. They are, of course, perfectly safe now that they are hard; but I must confess I was nervous about the first when the centring was removed after being up a month. The work was done in winter time; had no finished surface, and was exposed to snow, rain, and frost. I gave the centring 2in. rise in the middle, and when it

was removed the ceiling came down 1½in. The roof was then put on, and the effect of the joists wedging the plates under the queen posts brought it down another ¾in., so it was a perfectly level ceiling when finished—a satisfactory result when you think its weight was quite 50 tons. Before it got hard the vibration was considerable, so in the remaining ceilings I put two stiff joists in the 40ft. length, dividing it into three bays, which answered admirably.

All girders should be clothed in concrete, as this not only protects them from fire, but materially strengthens them. I have had some small beams tested by Professor Weighton at the Physical Science College. They were made with concrete 3 to 1, surrounding steel joists, and were all loaded in the centre, with bearings 5ft. apart. The steel in each case was one-twentieth the sectional area of the concrete. One 8in. deep by

6in. wide, with a steel joist 4in. by 1½in., I section, and weighing about 8lb. to the foot, placed in the centre of the beam, broke with 160cwt., the deflection being ¾in., which is equal to 320cwt. distributed load, and as a floor supported on four sides is twice as strong as a beam supported only at the ends, it follows that it would take 320 tons, or 12tons 16cwt. per superficial foot, to break down a floor 5ft. square with the same proportion of iron. Take one-sixth of this as the safe load, and it equals over 2 tons per superficial foot. A floor with the same quantity of steel and with 20ft. span would carry a safe load of 2½cwt. per superficial foot. Indeed, it would carry much more, as the steel would be placed in a much better position. Beams 6in. deep and 4in. wide, with 3in. x 1½in. joists, with lower flange ¾in. from bottom of beam instead of in the centre, and coated with oil to prevent adhesion, broke with 80cwt. on centre. And beams of the same size, and with the same size and position of joist, but with the web bulged to prevent any slipping, broke with exactly the same weight. I must say I expected a considerable difference; but in all these narrow beams a shearing of the concrete occurred just at the upper edge of the steel joists. These 6in. x 4in. beams were all two years old, and had been exposed to the extremes of temperature to see if any damage would be done to the concrete by the expansion and contraction of the joists. As far as one could tell, no movement of any sort had taken place. (The coefficient of strength of these small beams is 50 as compared with 39 for the larger beam, due to the more advantageous position of the steel joist.) It is rather a costly proceeding clothing large girders with 2in. of concrete outside the flanges on account of the cost of boxing; so the practice is to fill up the space from the under side of the floor to the bottom flange of the girder, leaving the under side of the flange exposed. To lessen the depth taken up by the girder and floor, angle-irons are often riveted to the web of the girder for the floors to rest on, leaving from 2in. to 3in. of concrete on

the top of the girder. I beg to acknowledge having made very considerable extracts from Mr. Sutcliffe's book on "Concrete," feeling on safe ground when his theory fitted with my own practical knowledge.

#### ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Architectural Association was held on Friday evening, the President, Mr. W. D. Caröe, F.S.A., in the chair.

#### THE MODERN STENCIL AND ITS APPLICATION TO INTERIOR DECORATION.

A paper on the subject of stencilling, illustrated by numerous examples of work executed by the author, was read by Mr. ARTHUR SILVER. The lecturer laid stress on the point that while the stencil-plate is a mere implement, the brush of the worker is aided by brain-power, unconsciously exercised possibly, but with results unmistakable; in this, one has a factor which tapestry, printed fabric, mosaic, and dozens of other more or less costly alternatives can never offer. For stencilling is, Mr. Silver continued, in its essence the work of the hand, guided and assisted by artificial help; yet always directly under the control of the worker. Hence the variety of colour, which the Japanese teach us is the most vital quality of stencilling, places stencil at the very head of all semi-mechanical methods. The old and erroneous idea was that hand-work, especially in repeated ornament, should try to achieve the dull accuracy of the machine; so in the old stencil flat equal colour was a *sine quâ non*; the newer and better idea is surely to impart to mechanical work all possible accident of individual expression. In the stencil-plate you have a method of repeating form, which, if you wish it, can be repeated with a regularity as precise as in printing or weaving. But while the printing-block, the engraved roller, or the spool of yarn can never vary its pre-arranged colour, stencilling is capable of immense variety. Here the great difference is seen, and the possibilities of stencilling open out. My own experience may be worth mentioning, but I beg to be absolved from any egoism in the matter. Mr. Aldham Heaton, Mr. Graham Rice, Mr. Ingram Taylor, Mr. Francis Heron, Mr. Gwatkin, and other designers, professional and amateur, have each in their own way done very charming things. I do not put my ideas before you as the only methods, nor claim that they are most novel or the best that can be done. I am anxious to learn, and I trust to-night to be enriched by the experience of others. Each worker must be influenced by his predecessors; yet if his art and heart are in the attempts, fresh and probably interesting modifications result. For instance, I may claim to have adhered to the legitimate principle of stencilling, and to have developed it as a distinct factor in the pattern. I have tried to make the construction decorative, as well as to decorate the construction. Practically speaking, a stencil is a cut-out pattern which may be reproduced *ad infinitum* by the application of colour brushed over its surface. To deal in methodical order with practical details, I will refer to the necessary construction of the design, the method of cutting, the materials useful for that purpose, the vehicles for preserving the stencil, the method of securing accuracy in the superposition of the plates which is called "registering," the process of colouring, and the different vehicles useful. I will then refer to the



fabrics which are effective for our purpose, and discuss their different virtues and qualities, and then conclude with reference to the ethical phase of design, the scope of colouring, and a general view of possibilities. We have assumed that the design is planned. The best way is to sketch the idea roughly in charcoal, then tint it broadly in colours to correspond with the separate plates required, and finally with a brush of pure white pigment correct the contours of your drawing, and put in the "ties." These "ties" are the spirit and essence of the stencil, and so far from being a galling restriction on your fancy, they must be considered as most helpful. It is by no means essential that they are all, or even any, left in the ground colour of your fabric. Again, you may quite disabuse your minds of the old idea that ties must be of the same strength and thickness. The strength of the ties must be in accordance with the area they have to support, and should vary according to the accentuation or expression to be insisted upon. You can realise at once the absurdity of uniform outline if you endeavoured to treat the finer inner petals of, say, the double poppy to the same strength of "tie" as would be required to emphasise the broader and outer ones. Of course, there is a limit here as in all else, and your limitation is governed by the area, cut and uncut, which your ties have to support. Again, in dealing with your ties, you must always arrange that they are connected with each other or their boundary, which is only another form of "tie"; otherwise you have a loose and flabby implement. The ties possess, in fact, most important values: they are a constant restraint, which prevent you from lapsing into too realistic details. It is not necessary that the ties should show up in the ground colour of your fabric. By the use of a mask you may tint any portion of the surface of your fabric to suit the colours which may be laid upon it ultimately. Thus the ties may occupy their position in relative colour which corresponds to their relative plane. So even ties may show a graduated effect of colour. Having now planned the design, the next step is to trace it carefully and transfer it to the material in which you select to cut it. If you employ paper for your plate, after the pattern is cut, it should be coated with a preservative, such as knotting, or turps combined with knotting, or some other vehicle, such as gold size and boiled oil. These possess the quality of rendering it waterproof and toughening it. Let us assume that we have a design requiring two plates to carry it out, and that these plates are large, say 6ft. by 3ft., and that one, the background of the design, is of small foliage where the ties naturally only inclose small areas. The other plate has bold and more important features with larger areas cut out. This latter plate will contract, or buckle, thus interfering, to some extent, with the exact registering of the design. You cannot help this, so you must manipulate all the more carefully. The Japanese have a way out of this difficulty. They cut many stencils at a time. Each plate is composed of two sheets, the upper and the lower, but between them they insert silk threads for the purpose of serving as ties, and to strengthen the plate generally. These threads are practically not existent, because the action of the brush moves the threads aside, and, therefore, the colour gets underneath. Although I am not prepared to accept this principle of construction in its entirety for the modern requirements of English decoration, in which very much larger dimensions are necessary, still they might be used for occasional purposes. Such, for instance, when an unbroken outline to a circle is required, like the letter O, which might well be cut in an unbroken ellipse and the central mask supported by threads. As for the material for the stencil plates, I have not yet discovered the ideally perfect substance; at present the best appears to me to be the stoutest cartoon-paper procurable, but it has its defects. The ideally perfect material should be easy to cut, so that it opposes no obstacle to the full expression of feeling of the design—that is to say its drawing. At the same time, whether cut in small or large area, the plate itself should lie flat by its own weight. The most promising fabric I have seen for this purpose is one prepared at Mr. Alexander Rottmann's factory in Tokio; it is extremely tough, made probably of waste silk; it appears afterwards to have been soaked in fish-oil; I have great hopes of this material. Both cartoon-paper and this fabric of Mr. Rottmann's may be cut on glass with the ordinary penknife. As to the durability of cartoon-paper, much depends upon the worker. An impulsive stenciller will break in fine frenzy

the ties in a very few repeats, or even by merely handling the plate. On the other hand, a careful worker can execute a hundred yards, and the stencil will not be depreciated. I have occasionally experimented with sheet-zinc, but with this you lose all "quality" in the design. The subtlety is gone, and a hard mechanism of a metal outline replaces the flexible expression of the brush or pencil. The method of cutting zinc and other thin metal is that first you go over the outline by means of a graver, then a hole is punched near the boundary of the form; the broken edge is then nipped firmly by the pliers, and the mass is torn away, the tear taking the direction of the graved lines; after this, the edges must be filed. Small work with very fine detail is best executed on very thin sheet-copper or brass. This must be coated with a resist, the design traced with a sharp metal point, and then the plate is subjected to an acid bath. The acid bites through the unprotected lines, the detached pieces fall away, and the result is as I have shown it to you. This method is not practicable for large designs requiring thicker sheets of metal, because by the time the acid has bitten through the plate it has also bitten sideways and destroyed your ties, if not your drawing. Besides, you can hardly control an acid bath 6ft. by 3ft. Next, as to the actual stencilling. For a single plate you can do pretty much as you please. You can work one equal colour over the whole surface, or a dozen. But if the plate is a unit of a repeated design, the question of registering becomes of paramount importance. Indeed, this obstacle has probably prevented stencilling being exploited for many years past. For this repeat is not only a question of the same forms reappearing at equal intervals, but also of joining the edges of the separate units correctly, so that any subtleties of line or form may be accurately united. To accomplish this, a terminal portion of each succeeding stencil is cut out in the preceding one. These terminals, or, as we call them, "keys," are lightly painted in with the first stencil plate; the succeeding plate has to reveal these "keys," and when it is accurately fitted, it is a proof that you may proceed with safety. In wall-papers, opaque colours minimise this difficulty of fitting the pattern. Any portion of one shade will match the similar shade in another piece; but for stencilling with its individual broken colour the shades are only approximate, and a straight joint would make the difference very evident. Now let us consider the fabrics suited for stencil decoration. You can stencil anything, from a cork carpet to tissue-paper, from the finest woven silk to the coarsest sacking, from a sheet of glass to rough-casting used for exterior work; but the pigments must be adapted to the material. These vary from water-colour to encaustic (that is, melted wax), from soft pastel to stiff distemper, or oils. The fabrics I have tried are legion. All the examples shown are worked in stains or dyes; consequently they are all washable, and, as far as my experience has gone, quite permanent. Here, again, in fairness to myself and my coadjutor, I am not prepared to give in detail the final result of elaborate and costly experiments. I have altogether discarded distemper for woven fabrics, although this does not prohibit its use for paper. Distemper and cloth are foreign bodies which do not amalgamate. Neither do I like opaque colour in oils where the decoration is near the eye or liable to be rubbed, unless the colour is thoroughly beaten into the cloth. Water-colour and distemper have both of them fine qualities, but for work which is to be thoroughly useful, I give the precedence to oils and stains. For in these latter, graduated washes come naturally. We shall agree that the chief artistic value of stencil lies in its graduated washes of colour, therefore I will say no more of opaque colours, for it is quite clear that they are not more difficult to work, and can be substituted if required. I do not say they are incapable of artistic treatment, but with them you approach the mechanical effect already obtained in wall-papers and the like. Next as to the method of working. Given a good stencil-plate, it all depends on the workman. The same tools are used, but with varying ingenuity. Let us take a design which employs two plates and a mask. It is immaterial whether you start stencilling the background or foreground. Let us take the background. In this you will not wish the ties to tell out with the same emphasis as in the scroll, the more important feature; therefore you lay upon your fabric the mask which shuts out the scroll, thus masking that portion. You then proceed to stain the

whole of the exposed fabric with a wash of colour; this leaves the scroll already in a higher key. That being done, the mask is removed and you substitute for it the stencil-plate which supplies the small foliage. Next you proceed to the scroll itself, and the design is complete. For three or more plates you work in a similar way. You use the ordinary brush made for the purpose. It is held vertically, and the colour is patted or brushed over the plate so that the pigment is driven into the fabric more or less energetically according to its texture. But the whole art lies in the quantity of colour taken up by the brush, and the way it is applied. This is the really important factor. Yet it is one that can hardly be taught—each must learn it by his own failures. Let me specially impress upon you the value of making mistakes. You need not necessarily start with that intention. From disaster you learn what no theory can teach; indeed, the very failure to obtain the effect you aimed at often enough supplies an idea for another effect that may be supremely well adapted for another motive. Success is based invariably on the number of obstacles encountered and overcome; so failures are the stepping-stones to achievements. When your brush is properly loaded you begin on that part of your form which needs the greatest emphasis, and work with the same brush, which each minute becomes dryer towards the lighter portion of the form. This gives the gradation of colour. It is the instinctive touch of the worker that accomplishes it; he himself cannot tell you how. It is curious to observe the peculiarities of temperament even in the ordinary process of stencilling, and the different effects obtained when precisely the same colours are used by different workers. But to return to the working of colours. Take, for example, the design, the tulip frieze. You will observe that the loaded brush is employed at the deepest portions, and when the brush is more or less dry you work it towards the portions of the form where the lighter tints are needed, and so on. For dark fabric, you have obviously to produce your design in lighter colours, and consequently must use opaque pigment. This means hard manual labour, because you must drive an opaque colour into the fabric bodily to insure permanent results. It is best to take a practically white pigment first and beat it into the whole pattern. This serves as a basis for your stains. Of course, this method means a double process, and is another objection to the use of body colour; besides, every fresh stencilling clogs up the finer interstices of the stencil-plate. If you require a dark ground, it is not essential to use a dark fabric where the yarns are dyed before the cloth is woven, for you can obtain your dark ground effects by masking out the design and staining your ground first to the required shade. Then you proceed as already explained. Another method, which is at present the subject of experiment with me, is to discharge the dark colour by chemical means and proceed as before; but as yet I am not satisfied sufficiently with my results to show any specimens. In using silk of a fine texture with a corded and "gros" surface, you can obtain some most charming effects. A piece of good silk is really a most sumptuous material to work upon when you have thoroughly mastered the use of your brush. It imparts richness and luminosity to the pigment; in the absolute subtlety of its possible gradation you can obtain the quality and softness of colour in a flower with the brilliancy of a jewel. For a lady's boudoir, or for even a Court dress, I think it would be difficult to beat. As you will now see for yourselves, the method of stencilling can be as simple as anything could well be, and there is little to say about it. But you may ask what I claim for stencilling as contrasted with other established processes. Of course, we shall be told that if you cannot employ first-rate mosaic fresco, or tapestry, it is wiser to avoid any substitute. Some of my results may be denounced as imitations of tapestry or of some other material. But there are imitations which are designed to deceive, and others too transparent to deceive anyone. Mr. Hamerton has said of painted tapestry that it was the only imitation which not merely rivalled, but which surpassed, its original, and some of the stencilling which I show you here is so closely allied to tapestry painting in its essence (that is, dyeing the thread after it has been woven, instead of before) that I hope you will admit that his words may be held to apply to some extent to the stencilling under discussion. The great merit of



the stencilling is that, while it may yield effects in fair rivalry with infinitely more costly methods, it does not conceal its own lowly origin. If you observe the limitations which it imposes, it repays you a thousandfold. Obliterate the ties, and endeavour to blot out its imperfections by added handwork, and you produce at best a dull, lifeless imitation of true painted decoration. But if you never lose sight of the fact that the stencil-plate is a mere implement, but that each touch of the brush of the worker is influenced by brain-power, then you will see that the mechanic within these limits is raised to an artist, and impresses a personality in every touch which no artisan at a printing-machine or loom, or setting the tesserae of mosaic, can in any way approach. Therefore I am not offering this stencil-painting in competition with wall-paper, nor with tapestries ancient or modern, nor with mosaics or frescoes. To architects it is needless to point out the advantage of selecting a surface decoration that can be applied as easily as a wall-paper—one that can be fixed in such a manner that it can be removed and re-applied elsewhere, in event of the householder shifting his domicile, and stand a thorough cleaning again and again. More important still is the fact that the fabric can be stencilled in lengths, so that not an inch of waste occurs, and, chief of all, it can be treated in the colour and character that suits the lighting of any particular room. Can anyone point out any method of decoration which has so many advantages? Can anyone point out any process which offers such unlimited colour possibilities? and, again, can anyone point out any decoration which can employ original design with so limited a cost? Every machine-manufactured decorative fabric must be prepared in hundreds of yards. Hence it must be planned to meet the average requirements. Here with a little stout paper and a few hours of skilled labour, you can produce a practical implement to carry out any given scheme. Now, what strikes an average to suit many different rooms, must needs fail to be the ideal for any single one. In further evidence of its flexibility in adapting itself to the particular place it has to occupy, it may be pointed out that stencilling necessitates no abrupt stopping of flowing lines. For in a frieze broken by a chimney breast a scroll need not be made to bend round a corner and so arrest a subtle movement. The pattern in every break, every recess, every start from skirting to ceiling, may be so arranged, and that simply, that the origin and birth of the line is evident, and carries on the fulfilment of its purpose quietly, restfully, and naturally to its termination. Further, it is by no means preposterous, or an over-costly method, to arrange a scheme for an entire frieze, in which no repetition of the same forms should occur. One may suggest for this purpose a flight of birds, with the exquisite subtlety of line and power expressed in their sweeping movements, to which may be added cloud forms, tree tops, &c. Even for an entire room there is no necessity for a repetition of any single forms, or forms combined within the limit of a repeat. Naturally, for such a purpose many plates would be required, and these would be worked together as a whole, with due regard to composition and proportion. You can also modify patterns already cut to an unlimited extent. One can frequently introduce in these certain forms suggested by special requirements. For instance, you can mask a portion, and insert a shield or monogram. The easy manner in which lettering can be worked into an existing design offers advantages to semi-public apartments. So far as design is concerned, there is practically no limit to the freedom with which it can be rendered by stencils. It may be suggested that stencilling may be admirable and suitable for friezes and such like purposes. But that the very quality of which I boast—namely, the broken colour—would be an actual impediment for fillings which have to be joined in straight and vertical lines. This difficulty we have overcome by placing two breadths of fabric side by side, working the same colour brush over the two salvages, therefore when breadths Nos. 1 and 2 are stencilled, breadth No. 3 is placed by the side of No. 2, and so on until the whole quantity is complete. I have recently had occasion to test this method. The design the "Benevenuto" was prepared to a large billiard-room and applied with entire success. There are few difficulties in this direction that cannot be overcome with a little determination and patience. Assuming the method just named to have been a failure, other resources were open. The case would then stand thus—viz., you have

to create a design for a wall filling, which shall join and yet not show the join. It follows, therefore, that if you are prohibited from working on the temporarily arranged joint with broken colour, you must plan your design so that you can cut in a straight line through the ground colour. In symmetrical designs this is a very simple matter, but in an all-over or powdered design a little more ingenuity is required. In the Tulip Garden filling, it will be difficult to trace a straight line which would allow the scissors to do its duty without cutting through some colour—for all that it is there—as a straightedge held against it will prove. Inasmuch as design plays so important a part in interior decoration, I may not be out of place in making a few remarks on the ethics of that portion of our subject. Somebody has said that a plain sheet of white paper is more beautiful than any pattern or painting ever worked on it. If such a statement is true—it is only so in the sense that silence is golden is true. Would knowledge have advanced if all practised golden silence? If we had all adopted the cult of the white paper, where had art come in? To be satisfied with nothing is the pride of those who cannot obtain anything. Therefore, as we are not satisfied with bare walls, we must have design. If we have design we must endeavour to realise the purpose to which the particular design is applied. The first is to grasp and adhere to the fact that walls are perpendicular and that the surfaces are flat. Also let it be continually borne in mind that, almost without exception, a room has its definite purpose. It also contains, as a rule, doors, a fireplace, windows, and recesses. The wall spaces are broken up by the fittings, furniture, hangings, and pictures. Therefore the continuity of the design is certain to be interfered with in the ordinary course of things. These conditions are emphatic and must be accepted and likewise turned to advantage. Let us briefly consider the various purposes of the various rooms. A sensitive worker is necessarily influenced by different emotions in sympathy with the character of the rooms for which the design is being prepared. It is only by realising acutely what these are, that a fit and proper result can be achieved. The dining-room should suggest breadth, solidity, and hospitality; the library, a physical repose and an inducement for study; the drawing-room should be stimulating and yet refined in detail; the boudoir should express dainty forms of facile and easy invention, and conduce to the charm of confidential exchanges; the bedroom is for slumber, therefore we do not want nightuares in the flat nor complete oblivion, but the song of the lullaby in pattern. For the nursery and its innocent occupants, fresh with the breath of life, what genius is too lofty to design for this humble purpose? He would be unworthy the name of "artist" who felt this work beneath him and ignored the opportunity for a never-ending influence in fancy, form, and colour, associated with the vastly-important fairy tale or legend. What a genius of the first rank can do with a fairy story you may all see in Sir E. Burne Jones's pictures of "The Briar Rose." The possessors of imaginative gifts who realise their ideas both for the finer and "coarser" arts for the advantage of the little ones, give to them the groundwork of an education—an education which is as important and as permanently influential as it is unconsciously received. Or for the same idea in the simplest materials, take Mr. Walter Crane's nursery wall-papers. The charming refinement and character of these designs is only equalled by the absolutely masterly skill with which practical limitations are turned to positive advantage. Not all parts of the house are so obvious in their suggestiveness, yet the staircase may symbolise an upward direction. Its walls exhibit large and unbroken spaces, revealing in its various flights rooms which have distinctive and separate uses, so the imagination may take note of such suggestions in conjunction, and thereby produce a design of stability and breadth which shall include and embrace all the others, as well as striking a keynote to the whole. Staircases need not be too archaeological. Some people treat them pre-historically with weird marble papers, or Egyptian symbols, or possibly Mediaeval allegories. The staircase should not be the place with a past, but the ladder for the future. For all these purposes the design is of the first importance. A good design really exercises an effect almost hypnotic. A designer must be a first cause for these effects. The suitability of an idea for a purpose is insistent. For instance, scullery utensils upon a grand piano

decorated with gesso are out of place, and lead to unpleasantness; but not more so than a finely-conceived decoration, gorgeous, and full of idea, carried out in mean materials for a back passage. So far I have dealt chiefly with form; we now approach colour—a still more important subject. What methods of economic production most nearly comply with the requirements of high art (so-called)? By the requirements of high art I mean a decoration which will offer you an interrupted line combined with infinite possibilities of colour. Stencilling fulfils these demands. By no other means short of hand-painting, whether in fresco or other material, can you give the worker so much scope to his fancy for varied colour. To talk of colour is practically impossible. Its nomenclature conveys nothing beyond a vague general notion. If, however, the form in design is important, surely colour has far more claims. The most joyous of designs may be saddened by colour, and yet a sombre motive may be treated with dignity in a scheme of bright red, which is supposed to be the most exhilarating. I say supposed to be exhilarating, for, after all, it is more the association of ideas than the raw colour which affects you. If we examine the rooms we live in, and the scheme of decoration appropriate to each room, one of the questions which almost naturally arises is, Why should a dining-room be always dark red? But, on the other hand, why should a drawing-room be colourless? Nor need a breakfast-room be too simple and virtuous. Gay colours seem to me as needful to begin the day as to end it. Ought we not at this time to consider very seriously the relative positions of English artists as designers and as colourists? Latterly, the pure invention of pattern which the designers of this country have evolved has attracted European attention. I firmly believe that we do "hold the field" above all nations for originality and invention in design; but as regards colour, that is another matter. I would not venture to claim our supremacy in that respect. A merchant can commission the English designer for something "new" in form and idea, and be sure he gets it: but when the stuff is made, a designer must often own to his sorrow that his scheme of colour has been greatly improved by the printer and manufacturer. Indeed, this is a matter sometimes left entirely to the buyer, the designer only supplying the outlines. This is not as it should be, and I have often wondered whether there are causes other than merely climatic reasons for this shortcoming. We have schools of design where invention of a kind is cultivated, but as for teaching pupils to emphasise the development of a finer sense of colour—there seems to be none. I am here following in the wake of my friend, Mr. Alex. Millar, who, in a lecture on carpet-designing given recently at the Society of Arts, called special attention to this deficiency in our national art training. He made a suggestion of the greatest value—that "colour," as distinct from form, should be taught as a separate subject; taught as thoroughly, and held of equal importance to form. Neither is complete without the other; but we take the one very seriously, and leave the pupil to pick up the other anyhow. Now that our designers have attracted European attention, I feel anxious that the onward march to the maintenance of our national supremacy in industrial design should not be crippled and hampered for the lack of that charming companion, colour. Form, beautiful as it may be, is but as dry bones, the mere skeleton of an idea. It must be clothed with life, and colour is to form what life is to the body. Although I have an intense objection to the French styles of modern design, I cannot but admit as colourists they are pre-eminent within their particular and somewhat restricted limits. It is only just to say that they are simply splendid in some examples, and that at the best we cannot touch them. Therefore, I would harp on this theme until the attention of those in authority is called to the crying want to complete the education of our native genius for inventing forms, which no one can deny exists. This has been brought about by artists whose names are as familiar to us—here—as household words, who have in their turn influenced practical craftsmen. One recognises thankfully the great impetus to this development given by those architects who have not only been quick to recognise these results, but to force their merits on public attention, thus exercising a power without which improvement would be slow indeed. We have now many very valuable manuals on decorative design, yet it seems strange that almost all these academical dishes are served



up without the flavour of colour. So the imaginative reader waits athirst for the writer's colour thought. Although colour has an impossible vocabulary—that is to say, only the crudest hues can be definitely put in words of a telling description, yet the imagination might be washed with the mental colour-brush. For it is evident the cost of colour printing prohibits every idea being illustrated by the writer. Fortunately, the stenciller can experiment with riotous extravagance; he, of all artists, should grapple with the great question of colour. As continual dwelling in a foreign land will accustom a stranger to think in the language of the country, so in thinking of forms we should never dis sever them from colour; and as every form takes shape in the mind, let the mental colour impregnate the idea as it grows to completion. Then the wedding bells will announce the union of the Music of Form with the Mystery of Colour, and will ring out in sweet harmonies when “the joy of fashioning in fairest seeming” is consummated.

Mr. LEWIS F. DAY, in proposing a vote of thanks to Mr. Silver, said he was practically in agreement with him, although he differed from him on one or two points. Of the two kinds of stencilling, independent and subsidiary, the lecturer had only mentioned one. Stencil was a very valuable aid in mural decorations, but they must not act as if there were no laws of right and wrong governing its use. The use of ties in stencil work was essential, and there was a danger in making the ties, that the attempt to conceal them might be so ingeniously carried out that it would be impossible to tell that the work was stencilled. The Japanese use of hair-ties was from this standpoint very objectionable, and in the instance of the use of such supports quoted by Mr. Silver, that for a letter O, the spectator, missing the ties, and knowing the process adopted, would always expect to see the central portion fall out. The knowledge of Japanese methods and work had stimulated our artists, but had tempted them to ignore some of the limitations of their art. The gradation in colour shown in modern stencil was not a new invention. The notable feature of Mr. Silver's work lay in its able design and in the application of stencilling to textile fabrics; personally, he did not like the use of oil on textiles, nor did he approve of distemper. He held that stencilling ought to be executed on the wall surface itself, and not on fabrics intended to be hung up. It was perfectly true that you could remove a textile fabric and hang it elsewhere; but no one ever did, and if the work was to remain permanently in a room it was better to stencil directly on the walls. He did not recognise the extraordinary superiority of stencilling over block printing; if a design was only to be repeated a few times it was hardly worth while to cut stencil plates, and if much of the dodging and arrangement described by the lecturer were required, it would be as well to trust entirely to handwork. At the same time he liked Mr. Silver all the better for claiming too much for his craft; but when he said that the artist could impress his personality upon stencilling, he thought he went too far. He did not think so badly as Mr. Silver did of English colour; it was immensely better than that produced in France or Germany. While Continental work showed many gradations and much delicate colour, as a whole the effect was crude and garish, and seldom rose to any great height. No French artist could vie in colour with Sir E. Burne-Jones.

Mr. GLEESON WHITE, in seconding the vote of thanks, remarked that the Japanese were the first to use stencil colours on textile fabrics, and even employed the process on the clothing of labourers. The new stencilling shown by Mr. Silver substituted hand work for ready-made papers, although all would admit that the designs of Mr. Lewis Day or Mr. Walter Crane would be very much better than those of the average stenciller. As Mr. Day had said, the attempt to get gradation in colour was not new; it was seen in the cheap work of forty or fifty years ago.

Mr. ALEXANDER ROTTMANN referred to his long sojourn in Japan, and the stencilling and cloisonné work he saw in that country. He claimed for stencilling that it could be given as much life and character as hand-painted work. In no other system of decoration could the personality and individuality of the worker be so well expressed as in the varying strength of tones given to stencilling. It was now difficult to distinguish hand-printed from block-printed wall-papers, and it was natural, therefore, that a taste for stencilling

should have revived. Indeed, it had revolutionised decorative art as applied to buildings, and had reduced the cost of hand-painted work in this country.

Mr. DAY, interposing, observed that the same effects of gradation in tone could be given to block-printed papers if the worker took the same time and pains and went to the same expense as in stencilling.

Mr. ROTTMANN rejoined that opinions differed on this point; he did not agree with Mr. Day's contention, that stencils ought to be done directly on the wall.

Mr. G. H. FELLOWES-PRYNNE observed that the freedom and gradation of tones suggested its employment for church decoration. Its use and possibilities had not yet been developed, and they welcomed such practical demonstrations of the process as that which had been given by the lecturer. The expense of varying effects in printing was enormous; but with the stencil plate it was, as Mr. Silver had shown, easy.

Mr. HAMPDEN W. PRATT confessed that he had hitherto looked on stencilling with much prejudice; but it seemed to him, as executed by Mr. Silver, to be a thoroughly frank, conventional mode of treatment. It appeared, however, to be an expensive process. He indorsed Mr. Lewis Day's views of the greater beauty of English over Continental schemes of colour; in French and German work there was an undoubted prettiness of effect; but with it a certain crudeness. The ties should not be ignored in stencilling, for these very limitations gave value to the design. He had been disappointed to hear that the best effects of variation of tone could not be attained when the work was done directly on the plastered wall surface.

Messrs. M. W. WEBB and H. D. SATCHELL having spoken, the PRESIDENT summed up the discussion, remarking that, as the value of stencilling depended entirely on the craftsman, it was absolutely handwork, and not a mere mechanical process. A great expert was apt to go a little too far. The essence of the effect depended on graduated washes, and when stencilling departed from a flat treatment it was carried beyond its proper limits. He deprecated the introduction of the human figure into stencilled designs. He thought that in the present day English designers were overworking the conventional and too familiar tree of life in their schemes of decoration. One great advantage of stencilling processes was that colour could be used tenderly or boldly, as the effect of lighting demanded. He thought English colour excelled when based on Japanese lines.

The vote of thanks was carried with acclamation.

#### BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE twenty-ninth annual general meeting of the donors and subscribers was held at the offices, 21, New Bridge-street, E.C., on Tuesday, Feb. 25th. Mr. B. E. Nightingale (the President elect) in the chair, supported by Messrs. E. Brooks (treasurer), J. Robson, C. K. Turpin, E. B. Gammon, W. Seymour, B. G. Thompson, F. S. Oldham, Octavius Newling, and other gentlemen. Mr. Charles Wall, the retiring President, was unable to attend.

The Secretary read the report, and Mr. E. Brooks (treasurer) read the balance-sheets for the past year. The report stated that the income had been well maintained, the following being the receipts—viz., £272 9s. 6d. in annual subscriptions, £300 12s. 6d. in donations, £137 10s. 0d. dividends, and a small amount of £6 6s. 5d., made up of balance from dinner account and interest on deposit at bank, making together £710 18s. 5d. There was also received the second moiety of the late Mr. T. Robinson's legacy of £250, bringing up the total for the year to £841 18s. 5d. The expenditure was £499 1s. 2d., including £380 paid in pensions and £22 10s. 0d. in grants for temporary relief. An election was held in November for two pensioners, there being three candidates; the successful applicants were Mrs. Sophia Lovett and Mrs. Helena Bishop. Special attention was drawn to the fact of Mrs. Bishop being successful on her first application, this result having been in a great measure due to the fact of her late husband having subscribed for many years to the Institution, which, according to Rule 4, Section 5, enabled her to claim 270 votes, being 10 votes for each guinea subscribed by her late husband. One of the pensioners, Mr.

Edward Leconte, died during the year, having been elected in 1886. There are now 20 pensioners on the books, the total number elected since the foundation being 42. Three children are being educated and well cared for in the Orphan Working School by means of the presentations bought by the Builders' Clerks' Benevolent Institution. The annual dinner was held at the Holborn Restaurant on April 9, Mr. Charles Wall, the president, occupying the chair, when over £300 was collected as the result of his earnest appeal. Mr. B. E. Nightingale had consented to act as president for the present year. The report concluded by acknowledging the unflinching support received from the various branches of the building trade.

The President elect, in moving the adoption of the report, said he felt it was rather bad for him to follow so good a speaker as Mr. Wall, who had preceded him in that chair; but he fully hoped that he should have the friendly help and co-operation of the committee, and that the year would prove to be a good and prosperous one for the Institution. He concluded by moving “That the report and balance sheet as read be adopted and printed, together with the list of subscribers and rules of the Institution.” Mr. F. S. Oldham seconded, and referred to the advance in the income, and to the good work done last year; also to the small sum spent in working expenses. He had no doubt that under Mr. Nightingale they would have a successful year. The motion was then put, and carried unanimously.

A vote of thanks to Mr. Wall and the other retiring officers was then proposed by Mr. Turpin and seconded by Mr. Brooks, reference being made to the eminent and successful services rendered to the Institution by Mr. Wall. He (Mr. Wall) had earned their warmest thanks, not only for the good work done by him, but for his kindness in serving them as he had so efficiently done on a very short notice. On the motion of Mr. B. G. Thompson, seconded by Mr. E. B. Gammon, the new officers were elected, including Mr. Nightingale as president, and Mr. Wall as vice-president.

#### CHIPS.

It has been arranged to take the London Water Bills on Friday, March 13. The Government scheme for dealing with the London water-supply includes the creation of a Trust, which will take over all responsibilities in connection with the supply.

In order to preserve the amenity of Holyrood Palace, the Government have purchased the Croftan-Righ lands, a kitchen-garden and cottage on an area of 14 acre abutting on the palace on the side next Milton-street. The price paid was £3,320.

Operations have been commenced at Bridlington Quay for the erection of the People's Palace and Pleasure Ground, on the Rosendale Estate, Quay-road. The tender of Mr. R. Bailey, of Bridlington Quay, was accepted on Saturday for £8,797.

The Cobden-road Board Schools, Sevenoaks, have recently been ventilated by means of Shorland's patent exhaust roof-ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The constructional classes conducted by Mr. D. Bennet Dobson at the High School, Glasgow, on Saturday visited the new Sanitary Chambers and the new Savings Bank, Glassford-street, in that city. This latter building will cost about £30,000, and entails a very large scheme of reconstruction. Mr. Muir, representing Messrs. Burnet, Son, and Campbell, the architects, conducted the students, who afterwards visited the Sanitary Chambers. The latter is being built principally for Mr. Fyfe's department, and will cost about £18,000. The style adopted has been a free and bold treatment of the Later Renaissance. Mr. Lochhead (Mr. A. B. McDonald's assistant) described the building.

At a special meeting of the Scarborough Town Council on Monday, the appointment of Mr. J. E. Everett, of Totton, Southampton, as resident engineer for the proposed marine drive and sea-wall extension works round the base of the Castle Hill, was confirmed. Mr. Everett was resident engineer for the carrying out of the Queenstown extension harbour wall, and had also been employed by the Roads and Bridges Department of New South Wales.

New board schools are about to be built in Sorobaro, Oban, N.B., at an estimated cost of £4,000, from plans by Mr. Alexander Shairp, architect, of that town.

Sir John Millais, President of the Royal Academy, has accepted the office of vice-president of the Royal Drawing Society.



## CONTENTS.

The Provincial Practitioner .....	301
One-Sided Contracts .....	302
County Lunatic Asylums.—XL .....	302
The Position of Provincial Auctioneers .....	303
Concrete Construction .....	304
Architectural Association .....	305
Builders' Clerks' Benevolent Institution .....	308
The BUILDING NEWS Directory .....	XLII.
Our Illustrations .....	309
Obituary .....	328
Building Intelligence .....	328
Competitions .....	328
Notes on Domestic Drainage.—IV .....	329
Cast-Iron in Builder's and Contractor's Work.—XVII .....	330
Royal Scottish Academy .....	331
Technical School and Library, Hyde .....	331
Architectural and Archaeological Societies .....	332
Correspondence .....	332
Intercommunication .....	332
Legal .....	332
Legal Intelligence .....	333
Water Supply and Sanitary Matters .....	333
Our Office Table .....	333
Meetings for the Ensuing Week .....	334
Trade News .....	334
Tenders .....	334

## ILLUSTRATIONS.

NEW SHIRE HALL, DURHAM.—THE PRINCE'S HALL RESTAURANT, PICCADILLY.—HOUSE AT FLAMBOROUGH.—HYDE MUNICIPAL LIBRARY AND TECHNICAL SCHOOL.—MEMORIAL CROSS, CHRIST CHURCH, EALING.—TRINITY PRESBYTERIAN CHURCH, NEWCASTLE-ON-TYNE.—CADDY FIELD SCHOOL, HALIFAX.

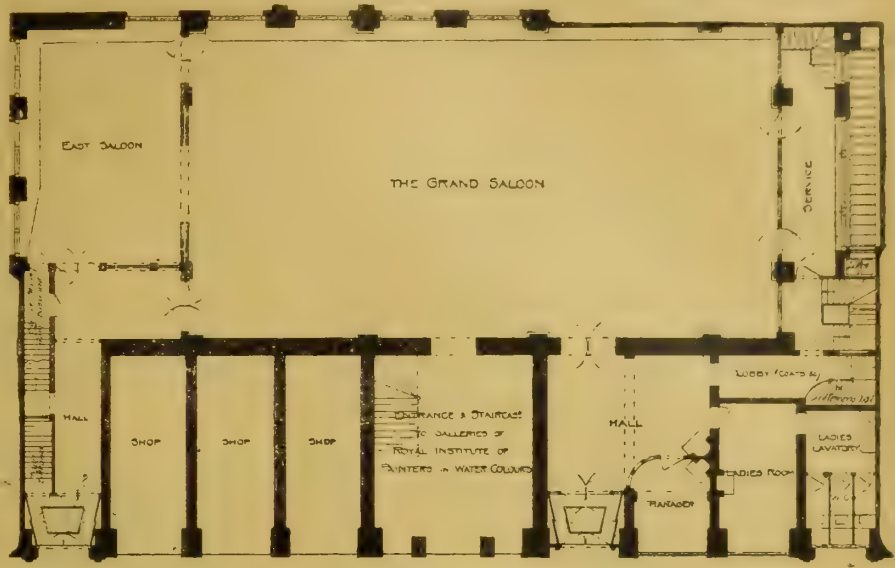
## Our Illustrations.

## NEW SHIRE HALL, DURHAM.

THIS County Council building is now in course of erection in Old Elvet, Durham, from the plans of Messrs. Barnes and Coates, of Sunderland, whose design, it will be remembered, was chosen last summer in public competition by the council, who gave preference to this, the adopted plan, it was said, on account of its agreement with the limitations of cost, which had been exceeded by others. We illustrated the geometrical drawings of the selected design in the BUILDING NEWS for August 16 last; but we have at no time expressed any opinion on the merits of the disputed points raised over the award, as the evidence was so conflicting. The conditions of the competition, at any rate, left no doubt as to the rights of the promoters, who reserved powers to themselves which architects should have declined to recognise, and by refusing to compete have rendered impossible in practice. After accepting the terms by becoming competitors, protest was futile. As to the relative architectural merits of the premiated designs, there could have been but little difference of opinion. Messrs. Barnes and Coates' plan for clever arrangement is, however, undoubtedly a good one. A description of their scheme was printed by us when we gave the drawings already referred to.

## PRINCE'S HALL, PICCADILLY.

THIS building is now undergoing considerable alteration for the purpose of converting it into a high-class restaurant, for the Prince's Hall Restaurant Company, Limited, who have acquired a lease of same. The floor of the concert-hall, which was at a level five feet below the pavement level, has been entirely taken out, and a new floor constructed at the level of the street, thus doing away with the necessity for the steps by which the concert-hall was approached. The restaurant consists of two saloons—the grand saloon, about 82ft. by 44ft., and the east saloon, about 32ft. by 22ft. The three shops in the western portion of the building are acquired for the restaurant, and here are formed the principal entrance-hall, retiring-rooms, &c., while another smaller entrance is provided at the east end of the building. Over the service lobby, at the end of the grand saloon, the musicians' gallery is placed, and the rooms over the entrances, halls, &c., are used as staff-rooms and lavatories. In the basement, under the main saloons, the whole of the walls and piers previously existing have been cleared away, the new floor being carried by stanchions and fine open kitchens and offices are thus obtained. The galleries of the Royal Institute of Painters in Water Colours over the Prince's Hall, with the approaches thereto, are not interfered with. We



## FLAMBOROUGH, NEAR SCARBOROUGH.

WE have received from Messrs. Hall, Cooper, and Davis, architects, Scarborough, the accompanying drawings of a new residence to be built at Flamborough for Miss Marsden, the contracts for which have been let, and the works commenced. The site is on the cliff top, about  $1\frac{1}{2}$  miles from the lighthouse, and commands a south aspect, with a good view of the sea and the neighbouring town of Bridlington, and is known as South Sea House, upon which at present stands a small homestead, which is to be incorporated in the new building. There will be a new carriage drive from the main coast road to the new residence, and it is proposed to plant this with clusters of trees, which will ultimately form a fine avenue of a quarter of a mile in length, with an entrance lodge at the gates. The main entrance to the house is from the west, from thence the hall is entered by a wind porch, and around the hall are grouped the drawing-room and dining-room, the whole of the kitchen arrangements being shut off to the north of these rooms, as shown on the drawings. It is to be built of West Riding rag stone walling and Whitby stone quoins and dressings, and the roofs covered with green Westmoreland slates. The contractors are:—Brick, stone, and plaster work, Mr. Abraham Moore; carpenter and joiner, Mr. Wm. Atkinson; smith and plumber, Mr. Sep. Bland; slater, Mr. J. Hardgrave; and painter, Mr. Johnson Wanless, all of Scarborough.

## TECHNICAL SCHOOL AND LIBRARY, HYDE.

(For description see p. 331.)

## PROPOSED MEMORIAL CROSS, EALING, W.

THIS proposed cross, which was designed for the Hilliard Memorial Committee by Mr. Maurice B. Adams, F.R.I.B.A., to be erected on a site in Christ Church churchyard, Ealing, is fully shown by the accompanying reduction from the line scale detail drawing. The cost is estimated at £250, the stipulated price, by Mr. Nathaniel Hitch, sculptor, and Portland stone throughout is the material intended. The total height to the top of the cross is 26ft. The lofty proportions and somewhat large scale of the fine tower and spire of St. Mary's, erected under the direction of the late Sir Gilbert Scott, at once render by comparison anything approaching a diminutive cross too insignificant, while the richness of detail exhibited by the church, adjoining which the site is so nearly located, necessitates a somewhat similar florid treatment for the cross. The plan figured by the elevation shows the several stages of the proposed structure, and the legends on the plate further elucidate the design.

## TRINITY PRESBYTERIAN CHURCH, NEWCASTLE.

The design for this building was selected in open competition by the assessor, Mr. G. Washington Browne, of Edinburgh, out of twenty-six sets of

plans submitted. The whole scheme was started at a cost of about £11,000, the foundation stone being laid on May 21st last by Sir Donald Currie, K.C.M.G., the stone for the exterior being from Kenton and Windy Nook quarries. The interior fittings will be of Oregon pine and Kawrie pine; the main roof timbers of pitch-pine, stained and varnished. The ground floor of church will be red wood-block flooring, while the aisles will be of oak. The arrangement of ground floor will be seen by reference to the accompanying plan, the upper floor being occupied by elders' vestry, ladies' room, and galleries to church and school. The contractor for the whole is Mr. G. H. Mauchlen, and the clerk of the works Mr. M. M. Dodd. The architects are Messrs. Marshall and Dick, 4, Northumberland-street, Newcastle-on-Tyne.

## CADDY FIELD SCHOOL, HALIFAX.

THIS school is now in course of erection for the Halifax School Board, from plans submitted in competition by Mr. Joseph F. Walsh. The site, the only available one in the district, has a fall of 1 in 4, and this, together with the fact that the coal and fireclay have been worked, have added greatly to the cost of the building. Accommodation is provided for 165 infants, and the plan is arranged with a view of future additions of classrooms for first and second standards on the other side of central hall, and on a higher level, to be entered from an upper playground. Externally the walls are of iron-stained local stones wallied in random courses, and internally of pointed brickwork, with glazed brick dadoes. The floors are all of wooden block. Covered playgrounds are formed under the classrooms on the lower level of playground. The total cost will be about £2,500.

## CHIPS.

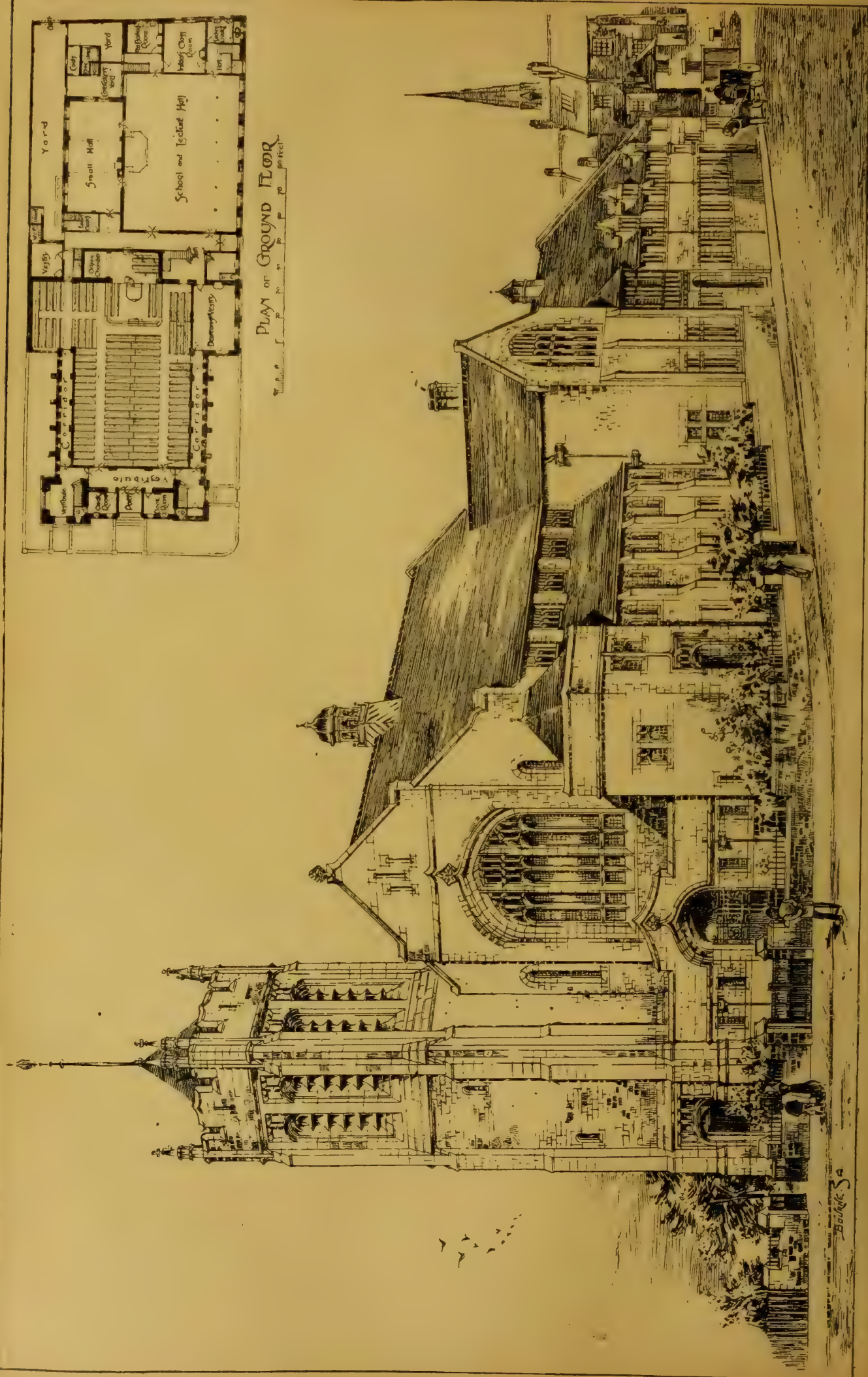
The guardians of the Chorlton Union held a special meeting on Monday to consider the Styl "cottage homes" scheme. A resolution approving of the scheme was passed by 14 votes to 7. A further amendment, limiting the cost of the proposed homes to £30,000 instead of £50,000, was defeated by 11 votes to 10. It was thereupon decided to accept the tender of Mr. C. H. Normanton to build the homes and schools for £50,310.

A stained-glass window has just been placed in Kinclaven parish church in memory of James Stewart. The subject chosen is that of the Good Samaritan. The work has been executed by Messrs. Stephen Adams and Co., Glasgow.

The excavations south of Sebastopol have led to the discovery of the Byzantine city of Cherson, the different quarters, the chief buildings, and the ruins of 30 churches having been laid bare. Moreover, the site proves to be one of a more ancient settlement, and coins and other Greco-Scythian relics are being found. The excavations are under the direction of Dr. Kosciusko.

Memorial stones were laid last week of an extension of the Y.M.C.A. premises in Borough-road, Sunderland. The enlargement will cost £5,000, and will include new reading-room 34ft. by 20ft., gymnasium 32ft. by 24ft. and 23ft. in height, and lecture-hall 50ft. by 32ft., the latter being seated for 360 persons.





TRINITY PRESBYTERIAN CHURCH, NEWCASTLE-ON-TYNE.





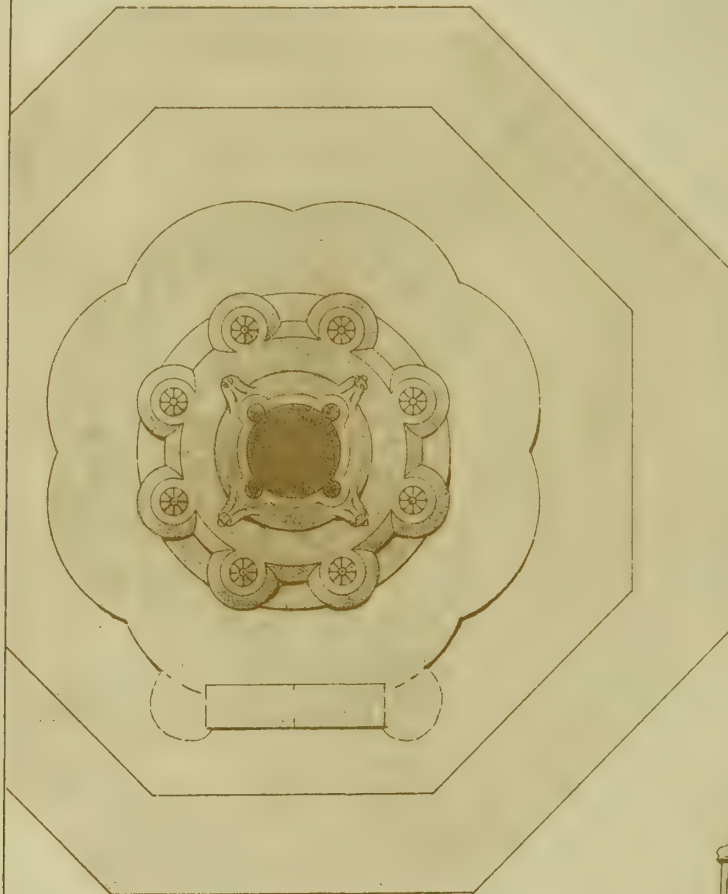


PROPOSED

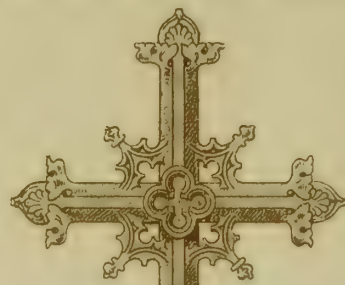
Memorial Cross  
to the late vicar the  
Rev. J. S. Billiard M.A.  
Christ Church Salting.

SUGGESTED INSCRIPTION

"I KNOW THAT MY REDEEMER LIVETH AND THAT HE SHALL STAND AT THE LATTER DAY  
UPON THE EARTH AND THOUGH AFTER MY SKIN WORMS DESTROY THIS BODY YET IN  
MY FLESH SHALL I SEE GOD" JOB 19: 25

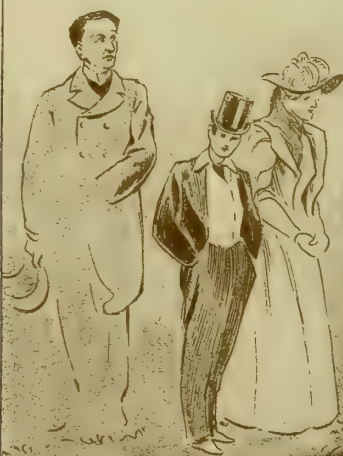


Plan: Section at base of shaft



THE FOUR EVANGELISTS  
& THEIR EMBLEMS

THE FOUR ARCHANGELS



ANGEL HOLDING  
THE 'BOOK OF LIFE'  
& ETERNAL TRUTH

ANGEL BEARING THE  
SUN - EMBLEM OF TIME &  
OF THE RESURRECTION

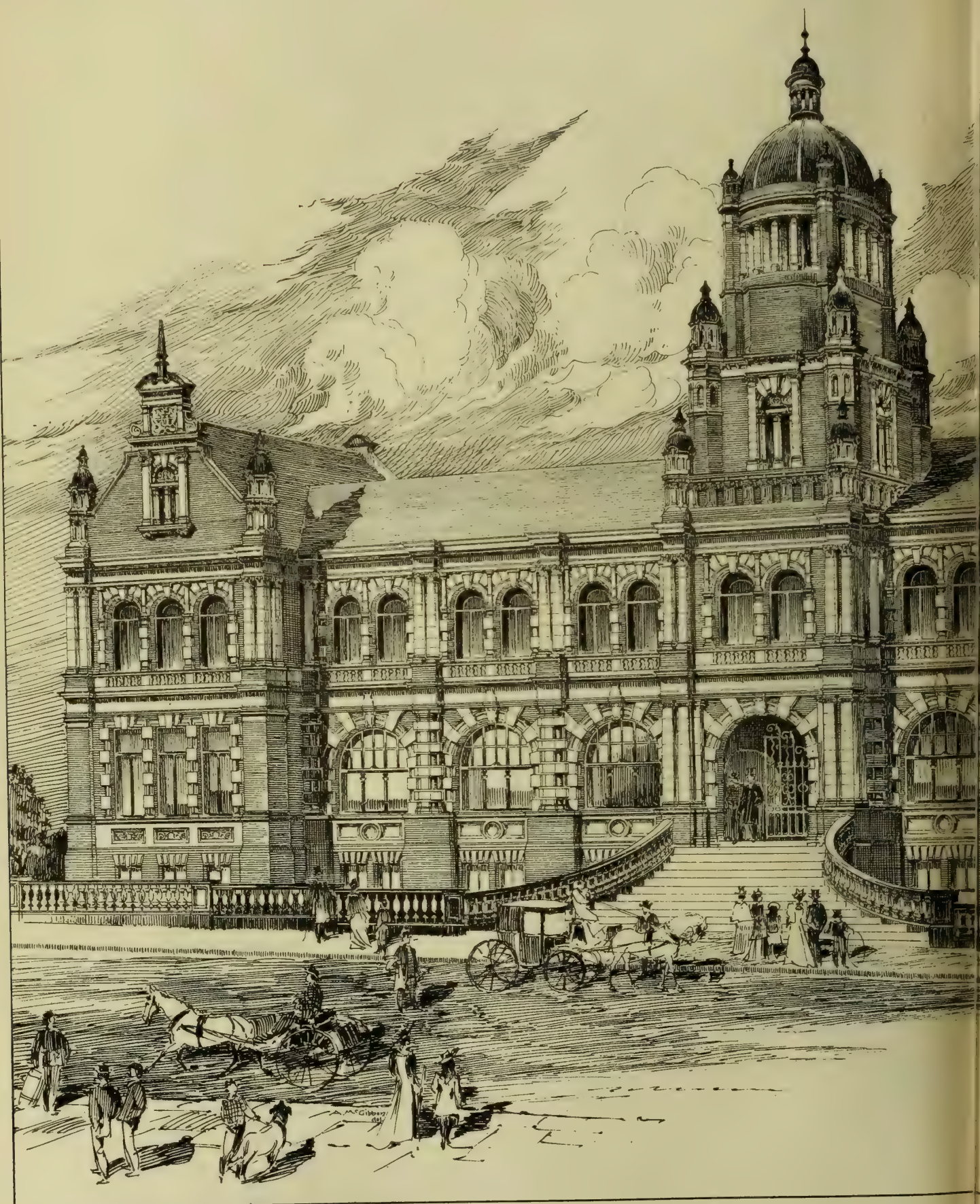








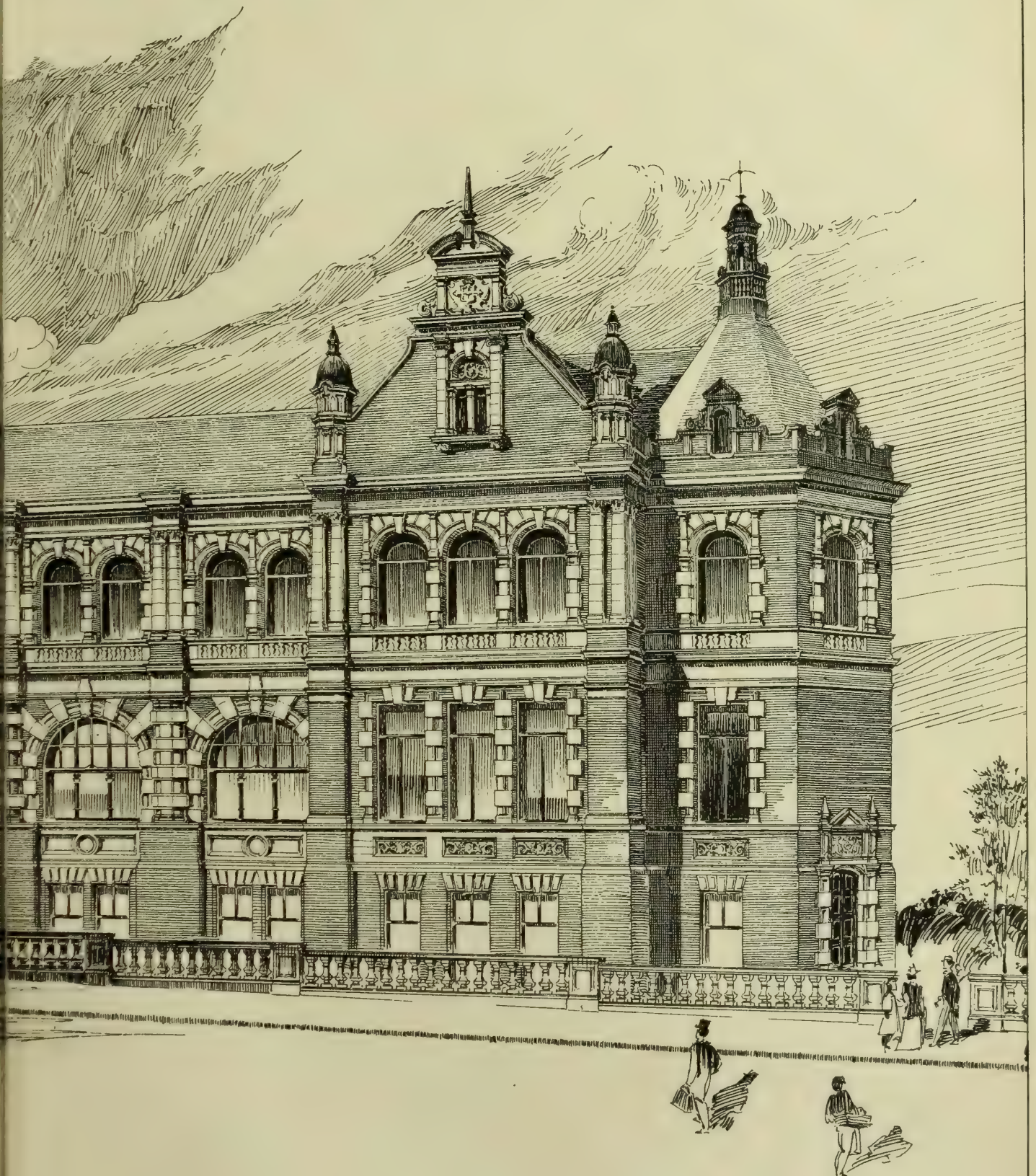
# NEW SHIRE HALL, DURHAM.





FEB. 28, 1896.

BARNES & COATES, A.A.R.I.B.A.  
Architects,  
SUNDERLAND.

















FEB. 28, 1896.



"PHOTO-TINT", by James Akerman, 6 Queen Square London W.C.

RESTAURANT, PICCADILLY,

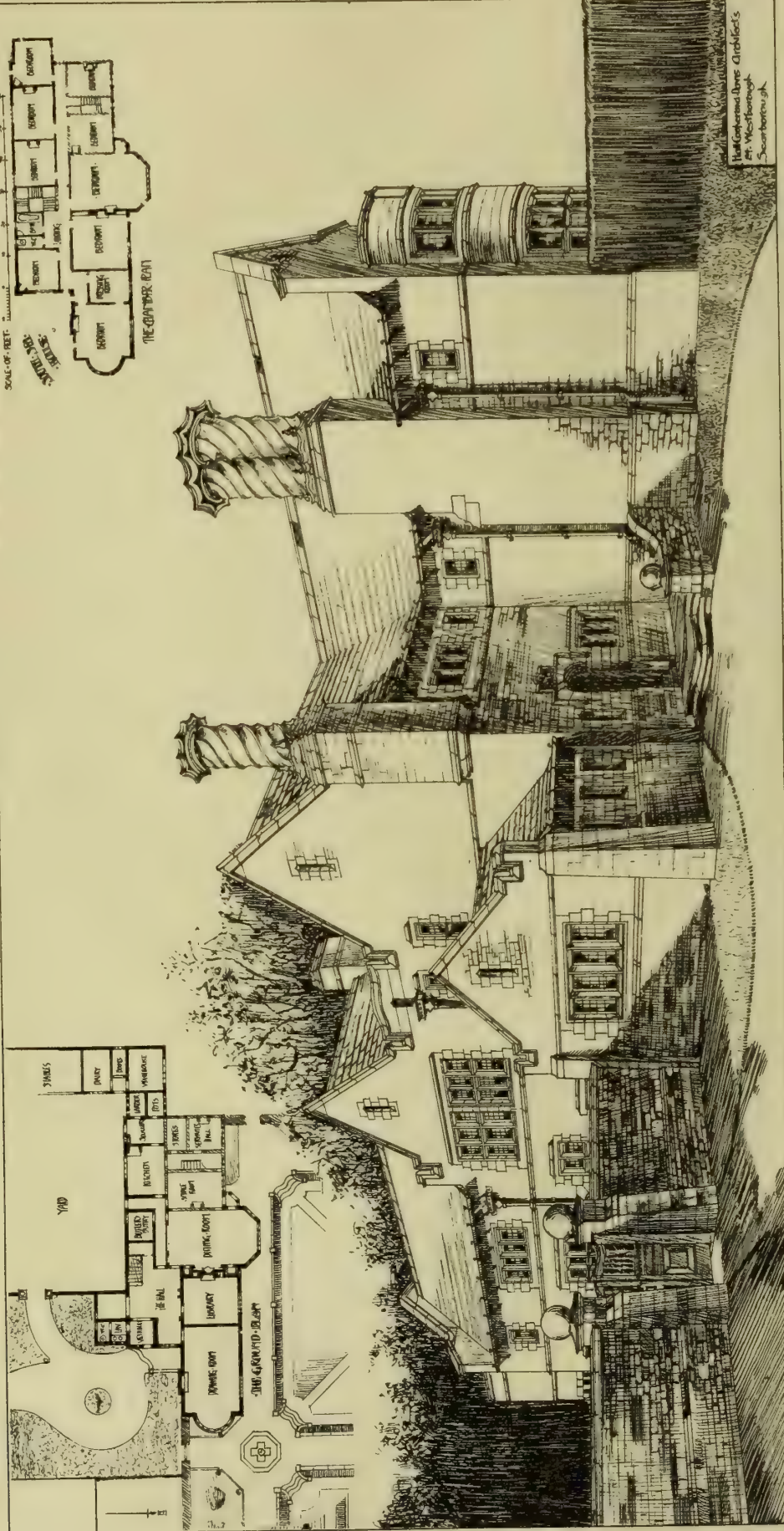










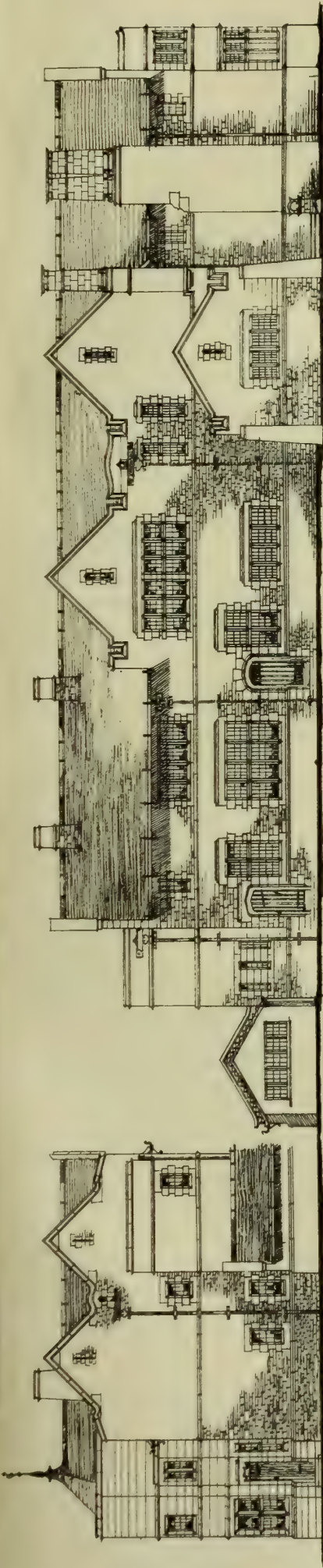


• SOUTH-WA-HOUSE-FLATBOROUGH-ENNY.  
• ROR-TYDE.  
• FLY-CLAPDEY.

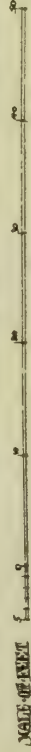




THE WEST ELEVATION



THE EAST ELEVATION



THE NORTH ELEVATION

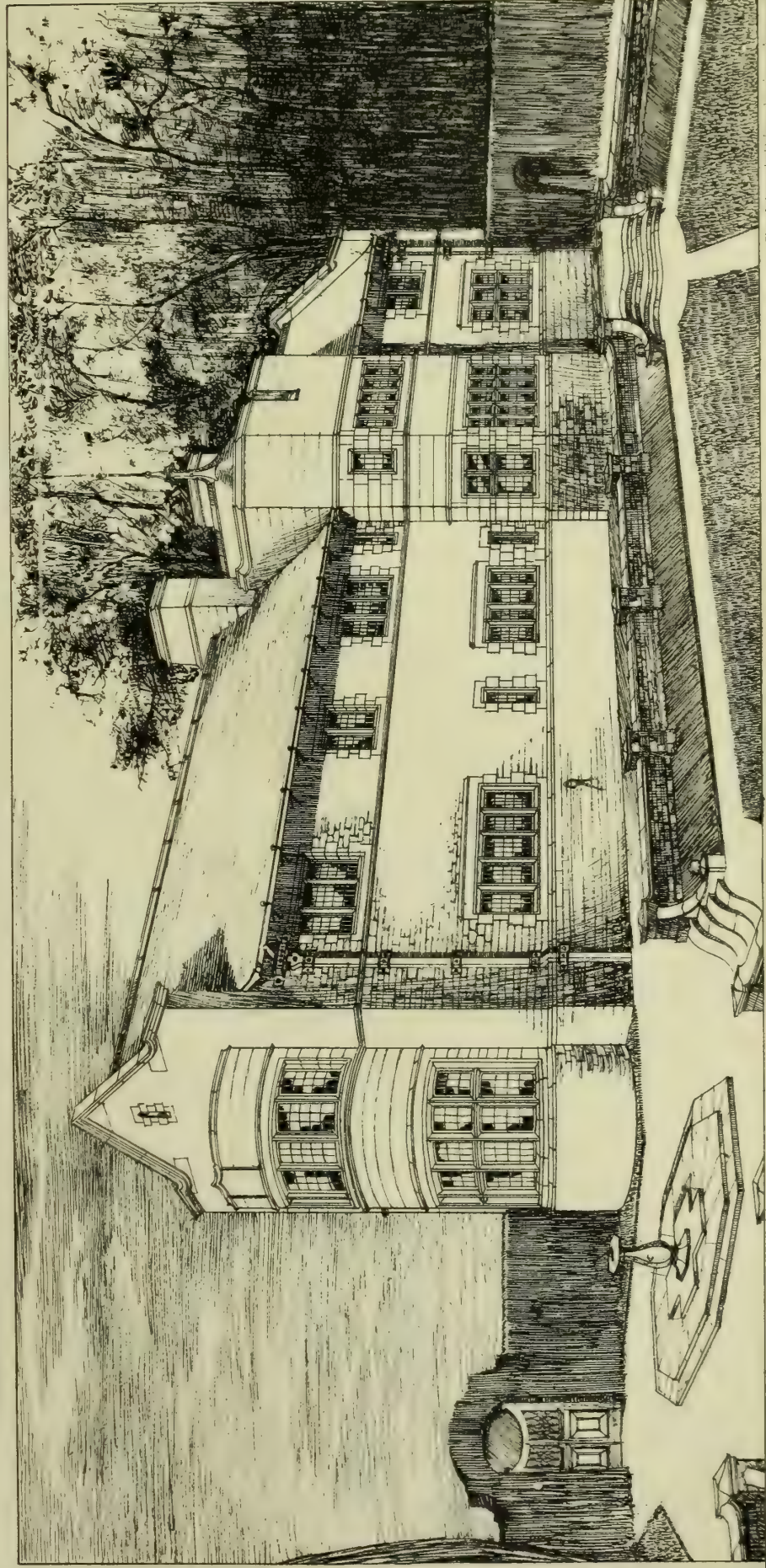


Photo lithographed by Messrs. J. & J. G. Smith, 15, Abchurch Lane, London, E.C. 4.

HOUSE AT FLAMBOROUGH, NEAR SCARBORO' MESSRS HALL COOPER & DAVIS ARCHTS







THE BUILDING, 1870, FEB. 10, 1870.

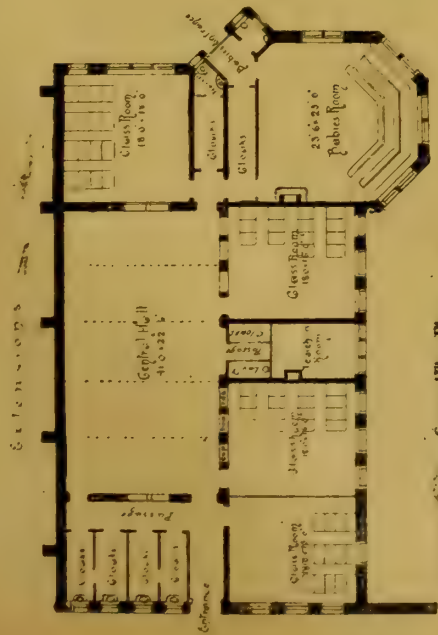


HYDE MUNICIPAL LIBRARY & TECHNICAL SCHOOL. MESSRS WOODHOUSE & WILLCOUGHBY ARCHTS

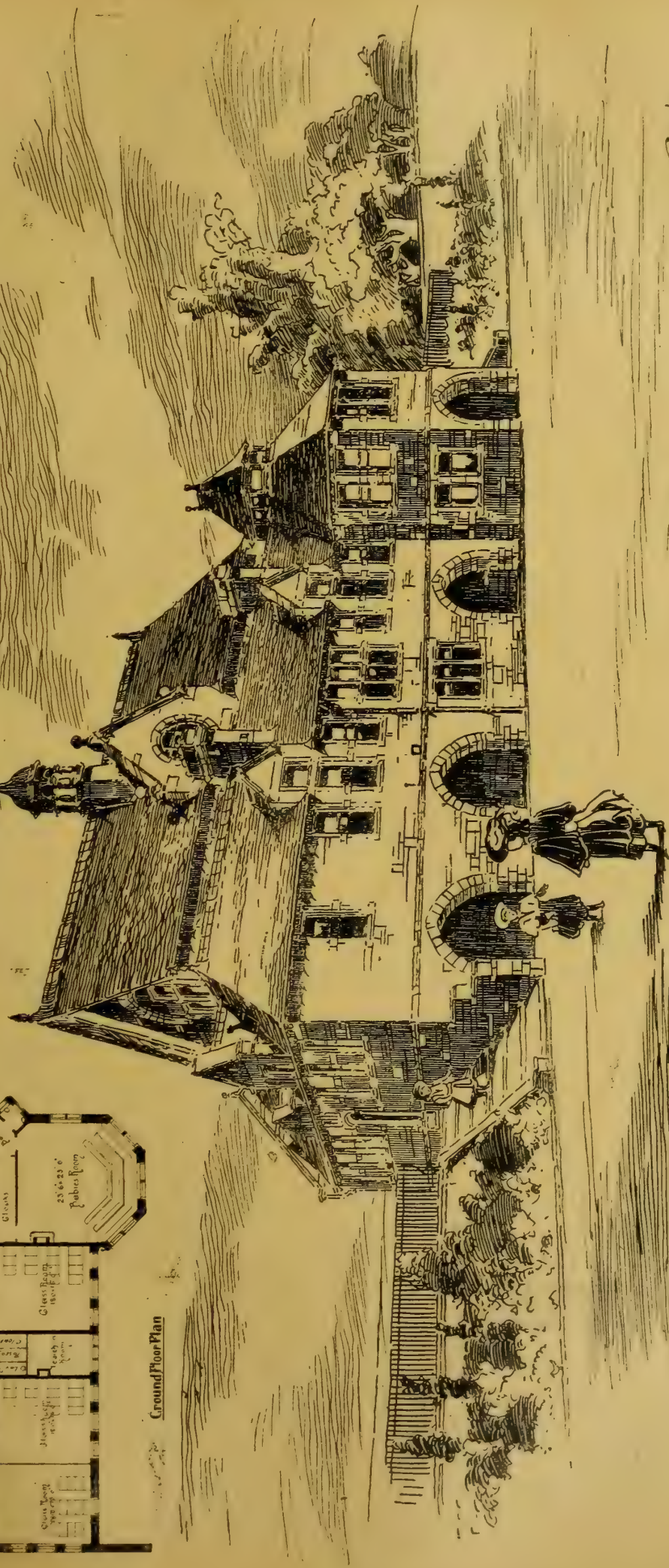








### Ground Floor Plan



J. F. Walsh.  
Architect.  
Malifax.

North-West View.



## OBITUARY.

MR. WILLIAM PATON BUCHAN, of Renfrew-street, Glasgow, the well-known plumber and sanitary engineer, died on Wednesday week, at his residence, at Cambuslang, in his 60th year. Mr. Buchan, who was a native of Fraserburgh, went to Glasgow in his youth, and served an apprenticeship as a plumber. A few years after he was out of his time he began business for himself, and on account of the thorough manner in which he executed his work soon acquired a good trade. He devoted his attention chiefly to sanitary engineering, and made a speciality of ventilation, on which he was regarded as an authority. He invented and patented many sanitary, drainage, and ventilating appliances, and was for many years a frequent correspondent and occasional contributor to our columns on matters germane to his craft. He was the author of a very valuable series on "Plumbing," which we published many years since, and which has since been republished—several editions having appeared—by Messrs. Crosby Lockwood and Co. He took an active part in the movement for the registration of plumbers, and in the disposal of the dead by cremation, being one of the directors of the local Cremation Society. He was a member of the Glasgow Philosophical Society and of various organisations connected with his trade, and was a member of a number of the city incorporations. An enthusiastic Freemason, he was one of the old brethren of St. John's 2 Bis. Mr. Buchan is survived by a widow and grown-up family. His body was cremated, on Saturday, at the crematorium recently built at the Western Necropolis at Glasgow, being the first thus disposed of in the city.

MR. WILLIAM CRABTREE, M.Inst.C.E. the borough engineer of Southport, died on Tuesday, at his residence, Zetland House, Manchester-road, Southport, after a long illness. Diseased, who was about 67 years of age, had served Southport in the office of borough engineer for 30 years, including the whole period since the incorporation in 1867. The chief works of which he had the oversight were the sewerage system, which cost the borough over £150,000, and the foreshore development. The execution of the latter, however, during the late engineer's illness, was largely entrusted to Mr. J. Hirst, the assistant engineer. Mr. Crabtree's eldest son is the borough engineer of Doncaster, and another son remains in the surveyor's department at Southport.

MR. AMOS P. CUTTING, of Worcester, Mass., a well-known architect, died in Los Angeles, Cal., on February 6. He was a native of Lyme, N. H., and began practice as an architect in 1868. He devoted himself to ecclesiastical architecture as a speciality, and made plans for 75 church buildings. His most important buildings were probably the New Hampshire State Library in Concord, an edifice costing nearly half a million dollars, plans for which were open to competition, and were submitted to architects in all parts of the United States, and the Billings Library building in Montpelier, Vt. He designed business structures, residences, and factories all over New England, and at the time of his death had in charge the construction of the Mathewson-street Methodist Episcopal Church, Providence, R. I.

In the paragraph on p. 190 in an issue of Jan. 31 relating to the new wharf at Silvertown, it should have been stated that Mr. John Western, the contractor, was of Chester, not Chelsea. The wharf is being constructed for the North Woolwich Land Co., whose agents are Messrs. Tapp and Jones, of 15, Great George-street, S.W.

A gravitation water scheme for the village of Dunlop was formally inaugurated on Saturday afternoon. Mrs. J. F. Dalrymple Hay, of Dunlop House, who granted the supply, together with ground for storage purposes, free of charge, turned on the water. Mr. Stuart, of Messrs. Warren and Stuart, C.E., Glasgow, was the engineer of the water scheme, and the contract was executed by Mr. Richmond, Galston.

A Local Government Board inquiry was held before Col. Hasted and Mr. E. P. Burd at Wolverhampton, on Tuesday, with regard to the proposal to put down new waterworks and to introduce the waste-water system in place of the pan system. It was stated by Mr. E. A. B. Woodward, waterworks engineer, that the new waterworks would cost about £30,000. Mr. James W. Bradley, the borough surveyor, gave evidence as to the necessity that exists in the town for the introduction of the water-carriage system of sewerage.

## Building Intelligence.

BRACKLEY.—The foundation-stone of a new wing to Magdalen College School, Brackley, was laid on Feb. 18th. The site is at the south end of the school. The new building will contain on the ground floor a masters' large sitting-room and three bedrooms, porch, with cloakroom and lavatory. On the upper floor there will be a large dormitory, sanatorium, and nurses' room, with the necessary offices. Mr. T. Garratt, A.R.I.B.A., of Shepherd's Bush, London, the architect, has endeavoured to harmonise the new wing architecturally with the present building. Local Handborough stone, with Bath stone dressings, is to be used in its construction. The cost will be £1,394, defrayed by Magdalen College, Oxford. The builders are Messrs. Benfield and Loxley, of Oxford.

SALISBURY.—Sir Arthur W. Blomfield, A.R.A., has furnished the dean and chapter of Salisbury Cathedral with a supplementary report, in which he states that the sum now required for the undertaking will amount to £15,000. Sir Arthur Blomfield states that from an examination of the foundations of the cathedral he discovered that the solid chalk was reached at a depth of 33ft. from the level of the ground in the Close. At the surface there is a bed of alluvial soil about 4ft. in thickness, then comes a stratum about 16in. thick of white clay, below which are found gravel and flints down to the chalk. This bed of gravel, some 28ft. in thickness, is constantly full of water, which at present stands, in a trial hole, almost to the top of the clay, and in floods and wet seasons rises considerably higher. As far as he has yet seen the foundations of the cathedral were not carried through the clay bed; but rest upon it; they are for the most part of rough, unsquared stones, and have very little spread of footing. He proposes to strengthen the foundations by cement-concrete, to form a solid bed round the foundations, and refers to the bulge in the piers in the great tower arches which span the nave, and adds that he can find no indication whatever of any recent movement of them.

## CHIPS.

At Trowbridge plans for a technical institute and school of art, prepared by Mr. Stanley, have been approved. The estimated outlay is £5,000, exclusive of site.

The death is announced, at the age of 84, of M. Louis Auguste Boileau, who, in the church of St. Eugene at Paris, was the first French architect to employ iron on a large scale for constructional purposes.

The restoration of the south transept of Ludlow parish church is about to be commenced, Mr. John Thompson, of Peterborough, being the contractor. The expense, about £1,000, will be borne by Col. Windsor Clive, a former member for the borough.

A new chapel has just been opened at Hucknall Torkard. Messrs. Clay and Cartledge were the builders, and Mr. Harper, of Nottingham, was the architect; the cost has been £3,100.

A committee of the town council of Cardiff have finally approved Mr. Edwin Seward's plans for the new Municipal Museum, to be erected in Park-place.

The Mitcham school board have adopted plans by Mr. H. P. Burke Downing, F.R.I.B.A., for new schools to be built at Singlegate.

The district council of Whitefield, near Bury, Lancs, have decided to carry out improvements at their sewage farm, at an estimated cost of £4,735, in accordance with plans prepared by Mr. Thorp, their engineer.

A new theatre is about to be built in Mostyn-street, Llandudno, from plans by Messrs. Darbyshire and Smith, of Manchester.

A movement is on foot to provide Turkish baths for Doncaster. Plans of the proposed new buildings have been drawn by Mr. Edwards, of Leeds.

The proposed line of traidways between Blackpool and Lytham is completed from Lytham to St. Anne's Pier, and at the other end enough material has been delivered for the work between Lytham and Ansdell. It is expected that the line will be opened at Easter.

The city council of Leeds has instructed Mr. T. Hewson, the city engineer, to prepare plans for new engines and boilers, and for the construction of ten additional sewage tanks to be constructed at the sewage disposal works at Rustrop, so as to diminish the pollution of the River Aire, by further purifying the sewage effluent.

## COMPETITIONS.

CHRISTCHURCH.—The rural district council have had upwards of a dozen plans sent in in competition for the proposed isolation hospital. The council are so hold a special meeting to adjudge the special merit of one particular set of plans. A correspondent drew attention in our columns in our issue of Jan. 17 last (p. 114) to the numerous duties expected to be discharged by the successful competitor for an inclusive commission of 5 per cent. The *Hampshire Independent*, in announcing the receipt of competitive plans, adds:—"Fortunate man, too, who gets selected. At a remuneration of just over £100, he is to be architect, general adviser, and clerk of the works!"

COCKERMOUTH.—ALL SAINTS' PARISH ROOMS.—The committee who have in hand the work of erecting parish rooms in connection with All Saints' Church, Cockermouth, have selected the designs submitted in competition by Mr. G. D. Oliver, Carlisle, and it is understood that the work will be proceeded with immediately. The site of the intended rooms is occupied at present by the old school which was attended by Wordsworth in his early boyhood. It is an Elizabethan structure, and an old panel upon the building with inscription and a tablet in the interior, will be preserved in the new rooms. Mr. Oliver's design shows a building of quaint appearance after the Elizabethan style. The accommodation provided includes two classrooms, kitchen, and retiring-room on the ground floor, and large hall and ladies' retiring-room on the first floor. It will be of local stone, with green slate roof.

NEWCASTLE-ON-TYNE.—In the competition of designs for the new Congregational Church, proposed to be built in Beech-grove in place of that in West Clayton-street, which has been sold, the assessor, Mr. James Cubitt, F.R.I.B.A., London, as stated last week, awarded the first premium of £30 to Mr. Geo. W. Ward, 18, Clayton Park-square, Newcastle; the second premium of £20 to Messrs. Marshall and Dick, 4, Northumberland-street, Newcastle; and the third premium, of £10, to Mr. Stephen Piper, County Chambers, Westgate-road, Newcastle. The building committee of the church decided to select Mr. Stephen Piper's design as the one most suited to their requirements. Twenty-six designs in all were submitted by the competing architects. The plan of the selected design shows a wide nave with transepts and passage aisles. The main entrances are from Westmoreland-road and Beech Grove-road. The accommodation is for 702 adults, allowing 20in. width for each person, and the bulk of the congregation having seating accommodation on the ground floor. The school is on the north end of the site, with two main entrances and staircases leading up to classrooms, on galleries. At the back of the school, near the platform, are ladies' and gentlemen's cloakrooms, and a kitchen. There is also an infants' classroom to accommodate 104 children, with access from the school, and with a separate entrance. A church parlour is placed on the first floor, and adjoining is a room to accommodate 100 adults, which can be divided by a movable screen. A simple treatment of the Fifteenth Century style is adopted. There are two spirelets above the staircase to galleries. In the interior there is a roof groining at the crossing of the transepts. The buildings are proposed to be lighted by electricity.

SOUTH SHORE, BLACKPOOL.—Mr. J. A. Nuttall's design has been selected from a number of competitive plans for the new Congregational church at South Shore. The building will be of Ruabon brick, and will accommodate 650 persons. It will cost about £3,000.

The Insanitary Property and Artisans' Dwellings Committee of the Liverpool Corporation have adopted plans prepared by the city engineer (Mr. H. Percy Boulnois) and the deputy-surveyor (Mr. F. T. Turton), dealing with the election of tenements for workmen on sites in Ford-street, Arley-street, and Gildart's-gardens, which have been cleared by the removal of insanitary houses.

On Tuesday week the Bishop of Chichester opened St. Stephen's National Schools, Borough-street, Brighton, which have been recently rebuilt from the plans of Mr. Charles E. Hewitt, architect, of 118, Queen's-road, Brighton. The cost of re-building, furnishing, &c., has amounted to nearly £1,700. The contract was undertaken by Messrs. J. J. G. Saunders and Sons, of Brighton. The new building has accommodation for 140 boys and 90 girls.



## NOTES ON DOMESTIC DRAINAGE.—IV.

## THE VENTILATION OF DRAINS.

It is important that all drains shall be open to the air at both ends, and so arranged that a current of fresh air may be continuously passing

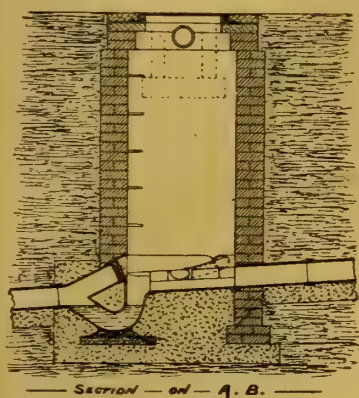


FIG. 2.

through them, so as to secure their sanitary efficiency.

Where this course is properly carried out the sewage becomes partially oxidised whilst passing through the drains, and any gaseous products are carried into the open air at some convenient point and innocuously disseminated. For the thorough ventilation of drains, it is not sufficient that the drains shall be open at each end, but there must also be a considerable difference of level between the openings, in order that a current of air may be

drains can be safely and effectively carried out in this manner. It may be that the head of the drain is the top of a w.c. soil-pipe, and it would probably be undesirable (on account of the adjacent windows, &c.) to constitute this a fresh-air inlet to the drain, without first carrying the soil-pipe above the eaves of the house. Under such circumstances, to consider the head of this soil-pipe as the low-level fresh-air inlet would necessitate the erection of an extraction pipe of great height at the lower, or discharging end of the drain, in order to obtain a difference of level between the inlet and outlet sufficiently satisfactory to insure the production of a current of air within the drain. In some instances, however, the local circumstances admit of low-level fresh-air inlets being placed at the head of the

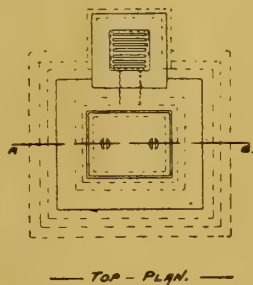


FIG. 5.

drains, whilst a high-level extracting pipe or shaft may be conveniently fixed at the outfall.

Generally, it is necessary to provide the low-level fresh-air inlet for the drainage system at the intercepting chamber, and the high-level extracting pipes or shafts at the head of each drain.

The thorough ventilation of every drain within the storm-water section can be easily accomplished. A fresh-air inlet is provided at the storm-water intercepting chamber (see Fig. 1), whilst the head of each branch terminates with an *untrapped* surface gulley or rain-water shoe.

In the case of the foul drainage section, it is not always practicable to arrange for every branch having through ventilation, but the

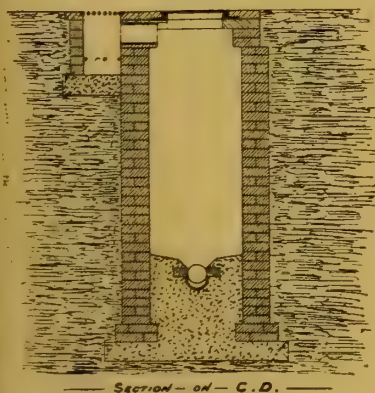


FIG. 3.

induced by the difference of level. For this reason the fresh-air inlets of the drains should be situated at a low level, whilst the vitiated air outlets should be at the highest level obtainable.

It is desirable that the direction of the air currents within the drains may be the same as that of the flow of the sewage, so that when a quantity of sewage is discharged into the drain the displaced air may be carried with it and

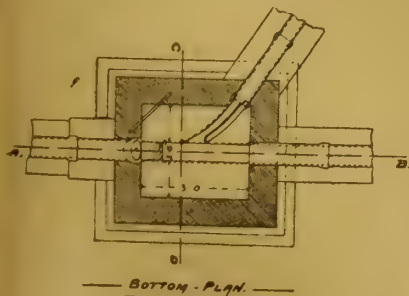


FIG. 4.

escape at the extracting pipe. In addition to this, the flowing sewage tends to induce a current of air within the drains in the same direction as the flow.

It is seldom, however, that the ventilation of

In places where no inconvenience can result, the fresh-air inlet to the drain should be perfectly free and open. This is usually effected by covering the intercepting chamber with a perforated iron grating having a dirt-box under. When the

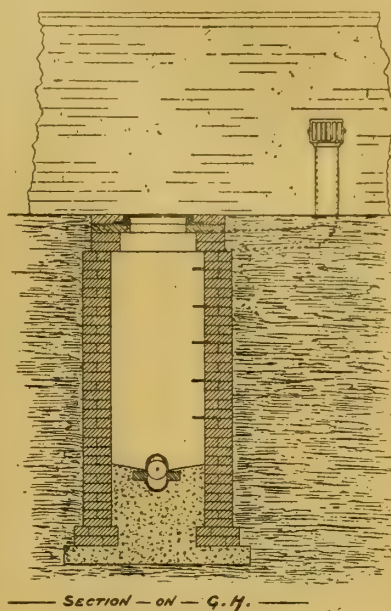


FIG. 7.

intercepting chamber cannot be conveniently covered with a perforated cover, a small ventilating chamber may be constructed at the side of the intercepting chamber, and covered with an iron grating, as shown in Figs. 2 to 5.

If the fresh-air inlet is near a door, window, or placed in any other position where a back draught

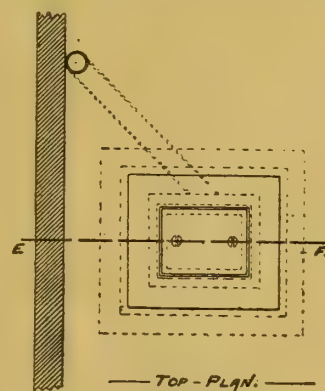


FIG. 8.

or reverse current would be undesirable, it must be so constructed as to prevent the egress of any air or gases from the drain, whilst at the same time allowing full adequate admission of fresh air into the drain. The ventilating cover or chamber is omitted, and an inlet-pipe carried from the

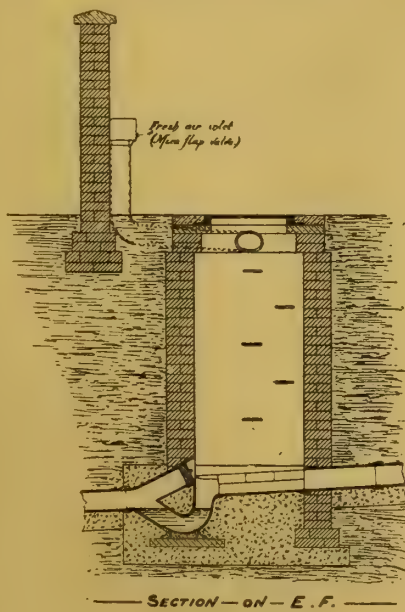


FIG. 6.

number and also the length of such unventilated branches should be as small as possible. At the same time, the whole course of every collecting drain or branch drain of any importance should be thoroughly ventilated.

The fresh-air inlets and the vitiated-air outlets should be so arranged that the greatest distance between the inlet and its furthest outlet is not more than 300ft. Where this distance is exceeded (as in a long length of drain), intermediate ventilating chambers or manholes should be provided in convenient situations, so that the length of drain ventilated by any given inlet and outlet may be kept within the limits mentioned.

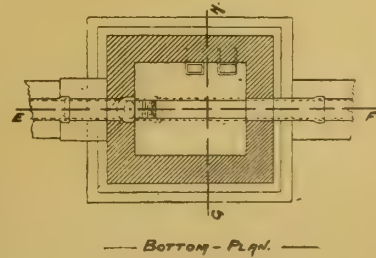


FIG. 9.

intercepting chamber to an adjacent wall or other suitable position, and terminating with a mica flap valve, as shown in Figs. 6 to 9. The inlet-pipe must enter the intercepting chamber as close to the surface of the ground as possible, so as to prevent any accumulation of sewer air in the



space between the top of the pipe and the man-hole cover. If heavy traffic is likely to pass over the site, it is necessary that the pipe should be about 2ft. below the surface of the ground to prevent it from being damaged or broken.

To assist the induction of a current of air, the mica flap inlet should be fixed in a comparatively cool place, and near the ground level, provided it is placed sufficiently high to be safe from any chance of being blocked with earth, rubbish, &c. A height of 2ft. or 3ft. from the ground will generally be found sufficient for this purpose.

It is a common practice to provide a fresh-air inlet much too small for the size of the drain it is intended to supply with air. For instance, a 4in. diameter fresh-air inlet-valve is sometimes provided to an intercepting chamber in which two 6in. drains discharge, and both of which are dependent on the 4in. inlet for the supply of air. The fresh-air inlet (whether it be a surface grating or mica flap-valve) should in all cases have an effective sectional area of not less than the sectional area of the drain or drains discharging into the intercepting chamber. A 6in. inlet-pipe will suffice for one 6in. drain, and a 9in. inlet for two 6in. drains.

The sum of the sectional areas of the vitiated-air outlets should be at least equal to the effective sectional area of the fresh-air inlets. If the head of each collecting drain or important branch has been carried up as an extracting shaft or vitiated-air outlet, it will generally be found that the combined sectional areas of these outlets will leave an ample margin.

The position and height of each extracting pipe should receive careful consideration, so that the air or gases escaping from the outlet may not prove a source of danger or annoyance. The pipes must be carried up perfectly straight for their whole height, no bends being permitted on account of any plinth, stringcourses, cornices, eaves, &c., that may be met with.

The top of each extracting pipe should be not less than 6ft. above the eaves of the roof or of any dormer window, with a minimum horizontal distance of 18ft. from any chimney or ventilator, so as to avoid the danger of down draught. They should be so placed that the wind may blow freely across the top of the pipe in order to induce an air current within the drains, and if the pipe can be carried higher than the ridge of the roof, so much the better.

As a broad principle, it is not desirable to provide any form of valve or cowl either to the inlet or outlet ventilator of the drains. In certain situations, however (as already described), it is found necessary to fix a mica valve to the fresh-air inlet; but the top of the outlet pipe should be left quite open, and simply finished with a spherical copper-wire guard to prevent birds building nests therein.

#### CAST-IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XVII.

By JOSEPH HORNER.

**O**RNAMENTAL builder's ironwork is of two kinds—that in which the ornament is used for the decoration of objects of utility, and that in which the ornament is used for purposes of decoration simply. Thus, a column, or a gutter or pipe, are of the first character; a terminal, a shield, a cresting, a crocket are of the latter. To the manufacture of the latter cast-iron lends itself admirably, because such castings are not subject to stress, and they can be cast as clean and sharp as the stone which is fashioned by the sculptor. We will consider some of the principal of these applications of the metal to ornament.

The designs which can be embodied in cast-iron columns now seem marvellous to those who can appreciate the difficulties of moulding them. Forms can be cast cleanly by those accustomed to this class of work, which no jobbing shop could undertake successfully. Columns are made in diameters ranging from 2in. to about 16in., and in various lengths as required. Mullions and pilasters of numerous designs are also obtainable. The shafts are either plain cylindrical, or fluted, or octagonal. Bases and capitals are plainly moulded, or the latter are generally foliated. Bracketing of flanges is not resorted to in ornamental capitals; but the bases are enlarged, spread out or moulded to the same, or nearly the same, dimensions as the flanges. Neither are bolt-holes cast in, but joggles are cast on for insertion into the stone foundation. Ornamental iron capitals are also cast for columns of stone. Pedestals are

made in iron to support statuary and vases. Each of these, carved in stone, would be so costly as often to preclude ornamentation. From the point of view of architectural effect, cast-iron columns are generally too attenuated—that is, the diameter bears too small a proportion to the length. It is, therefore, just as well that strictly Classic designs should not be embodied in them, so that harsh associations of ideas should not occur to the mind. Most customers like ornament about the capitals, and few quite plain columns therefore are cast. In the case of the more elaborate foliation, the ornament is screwed on; in some cases, cast on. If this is well cast the effect is good. It is seldom that shafts have entasis; they are generally plain tapered. Fluting comes out well in cast iron, and is in strict harmony with the canon that the lines of force should be emphasised. I once made a pattern for the columns of some water-tanks, in which the fluting was continued above the necking of the capital to the abacus; the effect was pleasing, and several hundreds were cast therefrom. Generally, I should prefer a rather plain column, with moulded base, fluted shaft, plain bell-shaped capital, and moulded abacus, to one in which ornament was in excess. Almost any founder can cast such plain columns, no matter what the shape of the mouldings. But I doubt if there are half a dozen foundries in Britain where clean, sharp foliated columns can be cast. This class of work is one of the specialties of the Saracen Foundry.

Cast iron holds a monopoly of the heavier supports for lamps for public lighting purposes. There is an almost unlimited choice of designs for these supports, including pillar lamps, bracket lamps, pendent lamps, and arch lamps.

Pillar lamps are the most important class. They range from the dwarf lamps used for promenades, balconies, and public entrances to those for mansions, hotels, clubs, theatres, and other public buildings, and the tall lamps employed for street-lighting, so that the lengths of the shafts range from 2ft. to 14ft., 15ft., or 16ft. The designs also include provision for one or more lanterns. Lanterns of an extensive variety of design are supplied. The shafts of the columns range in design from very simple, plain, slightly tapered forms, cheap and suitable for common street lamps which are required in large numbers, to those of large diameter, spreading bases, and elaborate ornamentation adapted for special situations in public squares, gardens, and institutions. Forms of beauty from every source are introduced into the ornamentation of these lamps. And though there may be a difference of 8in. or 10in. in the diameter of a shaft at base and top, the whole is formed in one casting. There is no material which has a chance of rivalry with cast iron for this kind of work. Before the era of cast iron, street-lighting was unknown. In the absence of this material we should probably have had our lamps suspended from wooden brackets attached to the house-fronts, or from plain brackets of wrought-iron bar.

Lamp brackets in cast iron are made in tasteful designs of scroll work, with lanterns supported, or pendent. Another way of carrying lanterns is by means of arches, the lanterns being also either supported or pendent, a method suitable for gateways. These arches are made in cast iron in various pretty designs. Another way is that of suspension from a central rod, suitable for lighting the interior of public buildings. But here, too, cast iron is sometimes used for the central rosette from which the rod depends.

Cast iron is the best material to use for guttering. The valley gutters are perfectly plain, but the outside gutters are usually moulded into some pleasing cornice or moulding section. In addition also the outer part of the moulded face is often wrought in various tasteful devices or enrichments. Heads of lions, panthers, gargoyles are sometimes cast separately and screwed to the moulded faces at intervals. The gutter is thus made in the hands of the founder a means of architectural adornment. Still further, adornments are sometimes added in the form of crestings along the top edge; ends or stops are made of similar sections, as also are the angle pieces cast to any angle, and adapted either for spigot or facet ends. In order to maintain and enhance the pleasing effect, the gutters are supported on ornamental brackets fastened to the wall with spikes, so that the gutter, which, if made in lead or timber, would be destitute of any beauty, becomes in cast iron a pleasing relief to the monotony of masonry. Circular gutters are also

obtainable, not merely made to fixed radii, but to any radius to suit customers' requirements.

Balconies are another branch of builder's work for which cast iron is better suited than any other material. Timber is not so desirable, masonry is heavy by comparison with iron, and in neither material can balconies be rendered such light ornamental adjuncts to an otherwise plain building as in cast iron. The remark applies to all kinds and sizes of balconies, whether used in private houses, mansions, flats, or places of business. Whether of small or of large dimensions, everything can readily be made to harmonise therewith, the supporting brackets, girders, floor-plates, railings, handrail, and standards.

Staircases are in many instances better made in cast iron than in any other material. Stone is superior for massive buildings, timber for dwelling-houses. But in business houses, in many warehouses, as well as in lighthouses and in all cases where the obstruction of light by solid masonry is objectionable, and in instances where space is so limited that spiral stairs are necessary, cast iron is more suitable than the usual materials. The whole of the staircase is readily made in iron, and is easily put together, the treads and risers, the standards and newel-posts, the railings and handrails, being cast as separate pieces. There is no risk of fracture if suitable proportions are adopted, although these structures are so slight, and the danger of fire spreading is much less than when stairs of timber are used. Turned timber balusters and plain timber treads do not either admit of such wealth of decoration as those made of cast iron. Balusters of cast iron are readily applied to stone staircases by the insertion of suitable sockets in the sides of the staircases. These are in harmony with the massive character of the stonework.

Iron, being so light, has the advantage, when applied to public buildings and houses of business, of occupying less space than stone or brick. This gives a greater available area, and lessens obstruction of light. Castings also, being continuous, can be more readily removed than masonry, and replaced by others when alterations become desirable. If combined with iron window-sashes, the maximum of light is obtainable. Too many houses of business, shops, warehouses, and public institutions, built mainly in masonry, require gas to dispel the gloom of winter days. Much of this artificial light might be dispensed with if iron were used more largely.

Cast-iron girders are still employed considerably in ornamental designs in situations where they are exposed to view, and where they are not required to sustain heavy loads, but only the roofs of verandahs, porticoes, and covered ways, and for supporting balconies. In such situations rolled joists would be incongruous. These cast girders are made in ornamental designs to harmonise with the ironwork structure of which they form a portion; lightening out is done in and about the neutral plane, so that the full strength of the girder due to its depth is preserved, and the lightening-out is designed to harmonise with ornament of the columns, railings, brackets, &c., used.

Cast iron is largely used as a means of ornamentation in structures which are built of other materials. Thus a building may be constructed mainly of stone, brick, or timber, but its plainness may be relieved with ornament in iron affixed securely thereto. Brackets, cantilevers, corbels, spandrels, &c., may be thus added. Brackets, corbels, and cantilevers are among the commonest applications of cast iron to these purposes. They are suitable for insertion under the ends of beams and girders, under balconies and verandahs, under raised footways and shelves and in numerous other situations. They are obtainable in many designs, perforated, and solid in outward appearance, ranging from a few inches on each vertical and horizontal edge up to 6ft. or 7ft. They are made at right angles or bevelled, or curved, to suit conservatories and covered ways. They are provided with screw holes for timber, or butts for masonry. Their design confers strength, while their tracery insures lightness as well as tasteful effect.

Spandrels are ornamented by means of cast-iron brackets, or arches, in designs adapted to different orders of architecture, different widths of opening and at various pitches for roof principals. The forms and dimension of these are as diverse as those of the bracket, and provision is made for attachment either to timber or stone. There is another class of bracket employed specially for attachment above columns, to impart a spreading



base for superincumbent beams, and to relieve the angularity of the unions. A special shaft is continued beyond the capital, having prepared faces for the attachment thereto of the brackets, which may number two, three, or four according to the position of the column.

Some sections of the ornamental work have been, and still are, made in wrought iron by the smith; but the greater facility of casting is causing the work of the smith to be lessened in modern building. I must leave the consideration of this subject for another article.

#### ROYAL SCOTTISH ACADEMY.

THE 70th annual exhibition of the R.S.A. was opened lately, and is considered to be one of a higher average of interest and varied excellence than has been the case for several years. Its arrangement follows the lines inaugurated by the present President, and limits selection to a definite number and definite space under and above the line. The bare spaces of walls are draped, and the upper part gracefully festooned. The statuary is disposed throughout the galleries, and everything is done to make them attractive to the public. Its 70th year finds it no longer alone in its glory as the representative of Scottish art, and the proof of its success as an academy is to be found in the fact that now and at its best it could not probably claim to be superior to similar exhibitions in the larger provincial towns. Still, as the most ancient and chartered institution, it is well that it should not lag behind its compeers. The present collection certainly contains no very great work of high art, nor perhaps even one that will create any great enthusiasm of delight in the public estimate; but it as certainly contains a very large number which the ordinary observer would very readily designate as perfect specimens of the art. All branches are well represented. The portraiture is not so prominent a feature, owing to the fewer number of large, full-size presentation pictures; but in the contributions of the President, Mr. Herdman, Mr. Lavery, and others, we have the best possible examples.

The landscapes are not so numerous, but the subjects are less commonplace, and are interesting from the greater variety and the evidence afforded by some striking samples of the Impressionist school that these are improving in their methods. Some are very large, as "June in the Austrian Tyrol," which delineates a great stretch of valley with a foreground of bluebells and gowans, where each flower is painted with the precision of a portrait. W. Beattie Brown, R.S.A., W. D. McKay, J. Smart, and others, have each several works of characteristic excellence. Architecture is not a popular subject, and there seems to be nothing or next to nothing representative of the picturesque aspects of street architecture. "Palaces in Venice," by Alex. Roche, is a rather gorgeous display of vivid colour, in which the sunshine has robbed an ancient palatial edifice, half falling to ruin, and Mr. Pollock Nisbet's "In the Church of Jerusalem, Bruges," shows very faithful rendering of an interior, with plain but massive architectural details.

The exhibition is rich in samples of works of the more ideal type; 70 is a very large picture by G. O. Reid, "Prince Charlie presenting his Sword to Lord Dalquharr," chiefly remarkable for the faithful rendering of the tartans and other costumes of a large assemblage. "Sic Transit," by G. Watts, R.A., "The Cotters' Saturday Night," by W. Hole, R.S.A., "Alnaschar's Dream," by W. D. Lockart; "A Scene in Lochleven Castle," from "The Abbot," by G. Hay, R.S.A.; "Gambling at the Foot of the Cross," the diploma picture of Charles Martin Hardie, R.S.A.; "A Border Ballad," by W. S. McGeorge, are a few of the most striking subjects which have been judiciously placed, and add greatly to the attractions of the galleries.

There are several fine sea pieces, of which "Floating," by R. McGregor, R.S.A., is a splendid specimen of water and its reflections of the boat. There are many samples of animal painting. "Strayed Sheep," by W. Holman Hunt, is a small but highly-finished picture, in which the wandering flock are brought in various ways to a standstill.

There are several works in the collection which are lent by the proprietors, and contribute largely to the interest of the whole. There are 23 sculpture pieces, mostly busts of private parties or public men. 416 is a half full size model of Mary

Queen of Scots, by Birnie Rhind, forming the central figure of the group for the large niche of the east side of National Portrait Gallery. 346, "King Robert the Bruce," is a full-size monumental figure for St. Conan's Church, Loch Awe, by Hubert Paton. 352, a similar model of the monument of the first Marquis of Argyll, erected in St. Giles' Cathedral. This is a very suggestive and finely-modelled design by Charles McBride.

The water-colour department, which, as before, is placed in the south room, is not remarkable for any very large or important works. The subjects are numerous, but generally of moderate size. There are excellent specimens of portraiture, landscape, and figure subjects. "A Capture of Rebels," by Arthur Melvil, is a striking picture representing summary justice executed on rebels of the Indian Mutiny; and 629, "An Incident at the Battle of Kandahar, 1880," by W. S. Cuming, is a figure subject, which tells its story well. "An Old Church at Caen," by Jessie McGibbon; "A Venetian Quay," by James Caw; and "A Continental Market Place," by John Terris; "In Venice," by George S. Ferrier, are the principal studies of picturesque effect in the field of foreign architecture.

Etchings are fairly represented, and are located in the small octagon. Mr. Henry McBrook has a great many pen-and-ink illustrations of "The Tales of the Covenanters"; W. Hole, R.S.A., has twelve etchings, illustrating the poems of Burns. "Pro Nobis," by the same artist, is an *Eve Homo*.

The architectural section is not quite so large as it has been, there being only 47, all told. They are located partly with the water-colours and partly with etchings in the small octagon. Those alongside the water-colours probably owe their position to the greater importance of the subjects represented, and the superior excellence of their pictorial effects.

The difficulties attending the proper placing of architectural drawings have never been successfully overcome. As no suitable room can be spared so keep them separate, a number are always misplaced for proper inspection. The appointment of Messrs. Honeyman, Leiper, and Blane to the rank of Academicians is one gratifying result of the recent alteration in the charter of the institution; but it is doubtful if any other practical benefit can be expected to follow, and the institution will, unless some endowment is provided, remain an academy of architecture only in name. The architect of the galleries very possibly intended the small octagon as the architectural room, for which purpose, if days were always bright, it would answer fairly well for the limited number of exhibits, which could then be all within easy reach of minute inspection. But, ordinarily, the light is very defective from the acute angle of illumination, and the only feasible suggestion would appear to be to shut it out altogether, and substitute the electric lamp at proper altitude, or the incandescent gas cluster. Church architecture is not represented by any very elaborate design, with the notable exception of Mr. Blane's Coates Memorial Church at Paisley. But there are many fine pictorial perspective views of public buildings in civil architectural design, and the exhibition, as usual, is much indebted to Glasgow for its contributions.

Mansion-houses, in the present circumstances of agricultural depression, are still far and few between; but there are numerous beautiful drawings of buildings of minor importance, so that, as a whole, the architectural department will fairly sustain the description given of this annual exhibition as one of the best that has been held for many years.

#### TECHNICAL SCHOOL AND LIBRARY, HYDE.

THE design for this building, by Messrs. Woodhouse and Willoughby, Manchester, was selected in a limited competition on the advice of Mr. Thos. Worthington, F.R.I.B.A., of Manchester, the assessor called in by the committee. The building is divided into two sections—a public free library in the one, and a technical school in the other. The structure averages three stories in height, having a symmetrical front to Union-street, with entrance to library section in centre of same, approached by a short flight of broad stone steps. Two other entrances also are provided—one from New-street for the technical school, having board-room and secretary's room adjacent; and another for the basement, by means of a passage and incline from New-street. In

the basement are placed laundry, cookery-room, room for heating apparatus, book and general store to library (communicating with same by circular stair and book-lift), dressmaking room, ladies' class-room, cloak-room, and lavatory. The public library is entirely on the ground floor, and faces Union-street. It comprises entrance hall, large lending space for public, reference library, public reading-room, and librarian's room. These several departments are so arranged round the lending library as to insure perfect supervision of every part; and ready access to every room is gained, with the avoidance of unnecessary steps, corridors, and passages. Abundance of light, both from the top and side, is introduced into every part of the library, in conjunction with comfortable temperature and efficient ventilation. On the ground floor, in addition to the library, are provided also machine construction and drawing room, board room and lavatory, secretary's room, approached by separate entrance from New-street. The first floor comprises large north-lighted art room, with corridor adjoining, having ample space for students' lockers; chemical laboratory (approached by double doors through a lobby), with balance room, store and reagent room, combustion room, master's room, preparation room, and lecture theatre. There are also provided on this floor building construction room, physical laboratory, and lavatories for both sexes. Every teaching room throughout the building is correctly lighted from the left-hand side or the back. Provision for adequate heating and ventilation has been considered. Each floor of the school is approached by a spacious and well-lighted fireproof staircase, centrally situate and directly approached from the principal entrance. With regard to the materials used, all exposed internal joinery will be executed in pitch-pine, stained and varnished; corridors and passages to be laid with best pitch-pine blocks, while the entrances, halls, and library will be paved with ceramic mosaic of simple design. The floors of all teaching-rooms will be formed of rolled steel girders, red deal joists, and pitch-pine boards in narrow widths. The walls of corridors, staircases, hall, and landings will have a cement dado 4ft. high, surmounted by pitch-pine capping. The walls of teaching-rooms to have pitch-pine boarded dado, 4ft. high, with capping. Entrance and hall to library to have tiled dado 5ft. high. The elevations are designed to be faced with Ruabon bricks, with all dressings in terracotta, the enriched parts and ornament generally being specially modelled from cartoons approved by the architects. It is estimated that the structure will be erected at the total cost of £8,500.

#### CHIPS.

The district council of Castleton near Rochdale have decided to carry out a scheme of improvements to fifteen streets in the township, at an estimated cost of £11,600. Mr. Diggle, C.E., has been appointed engineer for the undertaking.

The London County Council have resolved to seek Parliamentary powers to widen Battersea Park-road from Simpson-street to Home-road, from 35ft. to 50ft., and to reconstruct the railway bridge over the road at Christ Church so as to increase the span from 30ft. to 50ft., and the headway from 14ft. to 16ft., at a cost of £20,430, subject to the contribution of one-fourth of the sum by Battersea Vestry.

The North Seaton Freestone Quarries have been reopened, after a lapse of 20 years, and the event was celebrated the other day by a luncheon given by Messrs. J. and T. Douglas at the Grand Hotel, Ashington. The greater part of the Grainger Estate buildings at Newcastle-on-Tyne were constructed of stone from these quarries.

The Duchess of York will distribute the prizes to the successful students of the Royal Female School of Art, at the Merchant Taylors' Hall, on Thursday next, the 5th of March.

The annual dinner of the Builders' Clerks' Benevolent Institution will be held at the Holborn Restaurant on Tuesday, March 24.

The Duchess of Albany reopened on Wednesday the wards (which have been closed for about four months) of the East London Hospital for Children, which is situate at Shadwell. The principal improvements comprise new bathrooms, ward offices, improved heating and ventilation, and additions of 170ft. floor space and 2,210ft. of cubic space to each of the wards.

The heritors of the parish of Lockerbie, Dumfriesshire, approved on Monday plans by Mr. Carruthers architect, for the erection of a new church at an estimated cost of £4,750.



# ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**EDINBURGH ARCHITECTURAL SOCIETY.**—Mr. Sydney Mitchell delivered his address as honorary president of the newly-founded Architectural Society, in Dowell's Rooms, Edinburgh, on the 20th inst. Mr. Mitchell urged them to remember that architecture was an art in the round, and not in the flat. It was, therefore, necessary to study buildings themselves, both old and new, rather than drawings of them. He drew a parallel between the composer of music and the architect, and pointed out that in both cases the intervention of other hands was necessary before their work could be brought before the public. The composer required the assistance of violinists and the players of instruments of various kinds, and the architect required the assistance of masons and carpenters and others. The composer's score was of no importance as a piece of handwriting, and the architect's drawing was of no importance as a picture. Both were merely means to an end. In the case of a painter, the picture was his completed work. It was both beginning and end. In the case of the architect, his drawing was of no importance as a picture. It was merely a beginning, the end was the building itself.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—Mr. Axel H. Haig, the well-known black-and-white artist, gave the members of this society, on Monday evening, some of his reminiscences of Spain, in the Law Institute, Albion-place. Mr. E. J. Dodgshun presided. The interest of the audience centred chiefly in the fine examples of Mr. Haig's work, which were reproduced by means of an oxy-hydrogen lantern. In a chatty way he told of his journeyings through sunny Spain, of the scenes which inspired the brush of Velasquez, and of the many old castles and churches of renown. At the conclusion a cordial vote of thanks was given to Mr. Haig.

## CHIPS.

The parish church of Oakham was reopened on Thursday in last week after the enlargement of the organ at a cost of £400, a work carried out by Messrs. Bradley and Foster, of Sheffield, the builders of the instrument. At the same service a new festival altar frontal was dedicated.

In the Chancery Division, judgment was given by Mr. Justice Romer on Saturday in an action, "Knight and another v. Simmonds," brought by property-owners at Wimbledon to restrain the defendant from carrying on any trade or business, and in particular that of a laundryman, on the ground that the carrying on of such business would be a breach of the restrictive covenants of a building scheme. His lordship granted an injunction as sought by the plaintiff Knight, but held that the other plaintiff, Williams, had waived his right to the enforcement of the restrictive covenants, and so far as he was concerned the action must be dismissed.

The Simplon Tunnel Convention was signed on Saturday by the Italian Minister of Public Works, the Minister of Finance, the Minister of the Treasury, on behalf of Italy, and also by the representatives of Switzerland.

A reservoir is in course of erection for the Swindon Water Board at Okus. Mr. J. R. Shopland, C.E., is the engineer, Mr. B. Winchcombe the contractor, and Mr. W. Comley, of New Swindon, the clerk of works.

The Edinburgh and Leith Gas Commissioners adopted on Monday a scheme for the better lighting of the southern districts of Edinburgh at an estimated cost of £13,000.

At Kingsland-road Congregational church, Bristol, on Friday, a new organ, encased in pitch-pine, and built by Messrs. Vowles, of Bristol, was formally opened.

The Kent County Council have rejected the scheme for the erection of a bridge over the Medway between Snodland and Burham, for which the parish councils concerned recently awarded a premium of £50 in a competition to Mr. Henry Woodhouse, of Liverpool.

New board schools are being erected at Hanley, and special consideration has been given to the ventilation, which is being carried out on the Boyle system.

The Police-station, Maryport, is to be considerably enlarged by the erection of a new court-house, magistrates' retiring rooms, suitable accommodation for witnesses, &c. The plans have been prepared by Mr. Geo. Dale Oliver, of Carlisle, the county architect. New lock-ups are also to be built for the county of Cumberland at Harrington and Kinkry Hill, from the designs of Mr. Oliver.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. F. Rogers.—J. E. P.—J. Wilson and Co.—Competitor.—E. G. (Lewes).—F. W. R.

## Correspondence.

### RIVERLESS LONDON.

To the Editor of the BUILDING NEWS.

SIR,—As you will see by my Register of Sales, it has become necessary to place my steam launch at the disposal of firms desirous of viewing water-side property. This arises from the fact that, since the end of October last, there have been no passenger steamers running on the Thames, with the exception of three ferry-boats (Millwall, Woolwich, and Gravesend). Does this not amount to a public scandal?—that the great highway of the Metropolis should be practically dead to passenger traffic? Cannot you use your powerful influence to remedy this scandal?—I am, &c.,

BRADSHAW BROWN.

Billiter-square Buildings, E.C.; and Estate Offices, Millwall, E., Feb. 25.

[There is no other capital in the world where a highway like the Thames would be allowed to be wasted. Mr. Bradshaw Brown's protest is most opportune. Let him, and the rest of us, work for the coming scheme of the London County Council.—Ed. "B. N."]

### FINISH FOR OAK.

SIR,—Re the letter from Mr. Maurice B. Adams, I was greatly interested in this, for although only an amateur carver and cabinet-maker, the How to Finish Oak-work is one of my perplexing subjects. I am at present making an elaborate mantelpiece and overmantel for a drawing-room, and am often asked how I am going to finish it. I propose doing it over with raw linseed oil. This I find darkens the wood and gives it a nice soft look, which the wood direct from the wood tools lacks. The oil soon sinks in, and leaves

the wood quite clean to the touch. I hope we shall have more correspondence on the subject.—I am, &c.

W. JAMES COOPER.

## Intercommunication.

### QUESTIONS.

[11481.] **Creosote.**—Would some reader kindly inform me which is the best way to creosote timber by dipping in the cold liquid, and also the probable cost per gallon? I propose to build a concrete tank for the purpose. Would this answer?—SUBSCRIBER.

## Legal.

### A NEW SKY-SIGN.

THE original idea of a sky-sign was undoubtedly a sign against the sky; in other words, a mode of advertising which should use the sky as a background for obtaining the publicity required. To do this, it was necessary to go higher than the roof, and, generally speaking, to make the sight of our cities and towns more hideous than before. When the London Building Act of 1894 came to be passed, the definition of a sky-sign was based upon this principle of a sky background. So in the section dealing with this point, after enumerating every possible form of sign by letters, models, and the like, it goes on to say, "which, or any part of which, sky-sign shall be visible against the sky from any point in any street or public way." It seemed as if the only way to get round this definition was to devise a sky-sign which should not be visible against the sky, and which should at the same time answer all the purposes of a huge advertisement to attract public attention.

In the recent case of the Savoy Hotel Company (*Times*, Feb. 11) we have an example of the way in which this was attempted, and also the story of how it failed. There a structure had been erected upon the hotel, composed of letters supported in a framework, with boarding behind them, upheld by separate stanchions. The result was that the letters were not "visible against the sky" in the words of the definition of the Act, but were very clearly to be seen against the boards at the back, with which they made altogether a very striking appearance. The London County Council took out a summons to get the thing removed, as being an illegal sky-sign; the magistrate did not see his way out of the definition in the Act, and so the Council went for a mandamus, which they have now obtained. The sole argument for the Hotel Company was that their sign, not being visible against the sky itself, could not be a sky-sign. Lord Justice Lindley made short work of this point, thinking the boarding at the back made the thing worse, as of course it did, in the way of ugliness. Lord Justice Kay said that as it was admitted that the letters, if alone, would be a sky-sign, and that if the words had been painted on the boards that would have been illegal, the fact that they were separate could make no difference. He also observed that the effect of putting up the boarding was to shut out more sky than ever. This sign must, therefore, come down, and with the law costs incurred, it would seem to have been rather a costly experiment in the way of evading the operation of a statute.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

R. C. W.—SEWER.—DRAINAGE.—If cesspools are still legally used in the locality, there seems no way by which the authorities can be compelled to supply a sewer or the householder to make drains. It may be a question for the Local Government Board as to whether or not a proper drainage scheme should be adopted.

In order to maintain and extend the success of the public libraries in Camberwell, Mr. J. Passmore Edwards has intimated to the librarian (Mr. Foskett) that he will pay the cost of the new library to be erected at Nunhead. This offer is in addition to the recent gift of £3,000 towards the Dulwich branch library. Mr. J. Passmore Edwards also gave the funds for building the lecture-hall and reading-room of the South London Fine Art Gallery, erected from the designs of Mr. Ernest George, which, it is expected, will shortly be taken over by the Library Commissioners.



## LEGAL INTELLIGENCE.

**RAILWAY STATIONS AND ANCIENT LIGHTS.—**  
**EMSLEY V. THE NORTH-EASTERN RAILWAY COMPANY.**—In the Court of Appeal on Friday, before Lords Justices Lindley, Kay, and A. L. Smith, judgment was given in an appeal, "Emsley v. the North-Eastern Railway Company," from a decision of Mr. Justice North. The plaintiff and appellant had moved for an injunction to restrain the defendant company from erecting a new parcels office in connection with the Central Station at Leeds so as to obstruct the plaintiff's ancient lights. The defence of the company was that they were acting within their statutory powers, and that the plaintiff's only remedy was compensation under the Lands Clauses Act of 1845. The plaintiff contended that the company's special Act for the construction of their works, obtained so far back as 1865, had expired, and that they had consequently no greater rights than ordinary landowners; but Mr. Justice North took a different view, and refused the injunction, and their Lordships now affirmed his decision, and dismissed the appeal, with costs.

**THE CENTRAL LONDON RAILWAY STATIONS.**—The case of Ryall's Trustees v. The Central London Railway Company was heard on Thursday in last week, at the London Sheriff's Court, before Mr. Under-Sheriff Burchell and a special jury. The question involved was the amount of compensation to be paid to the trustees for the premises situated at 31, Holborn, required by the railway company for the construction of a station, the amount claimed being £6,216. Witnesses were called by the respondents, who valued the property at £1,400, equivalent to 25 years' purchase. The jury assessed the compensation at £5,430. — On Monday, a similar case was heard at the same Court, also before Mr. Under-Sheriff and a special jury—viz., the claim made by Mr. Samuel Goldhill, tobacconist and cigar dealer, of High Holborn. The premises, which are required as the site of a station for the Central London Railway Company, are held by claimant on a lease, 13 years of which are unexpired, at an annual rental of £141, but he so sublet so that he only stood at £6 rent. Claimant asked £3,195 as compensation; the jury awarded him £2,150.

**CASES UNDER NEW LONDON BUILDING ACT.**—At the Greenwich Police-court, on the 20th inst., Mr. E. E. Wood, builder, 24, Nettleton-road, New-cross, appeared to two summonses taken out at the instance of the London County Council. Mr. Chilvers, from the Solicitor's Department, prosecuted, and Mr. Macmoran, Q.C., appeared for the defendant. Mr. Chilvers explained that the proceedings were taken under section 14 of the London Building Act, 1894, the defendant being summoned for having neglected to comply with certain notices requiring him to cause certain new buildings to be set back, so that the external walls and boundary fences of such buildings should be at a distance not less than the prescribed distance from the centre of a carriage-way leading from Albion-street to Albion-grove, Greenwich; and for this offence, Mr. Chilvers pointed out, the defendant had rendered himself liable, under sub-section 2 of section 200, to a penalty of not less than £2, and not more than £5. In support of the summonses, Mr. Turner, a surveyor in the office of the Council, was called, who produced a plan of a one-story shop and three dwelling-houses, which he stated were being erected by the defendant in Conington-road, Greenwich, and which also abutted upon a carriage-way leading from Albion-street to Albion-grove, and that the defendant had erected an external wall of the shop and the boundary fence of the houses at less than the prescribed distance from the centre of the carriage-way. For the defence, Mr. Macmoran stated that, before building, defendant submitted his plans to the district surveyor, under whose supervision the buildings had been erected; and he contended that no offence had been committed, as section 14 only dealt with the front of a building, and that it was the back of his client's buildings which abutted on the carriage-way. He also contended that the Council were not the proper parties under the Act to take proceedings, it being a matter entirely for the district surveyor, whose duty it was to supervise the buildings; and he referred to several sections of the Act which, he stated, supported his contention, and he also called the district surveyor's assistant, who stated the plans were approved by the district surveyor, and he produced certain correspondence which had passed between him and the County Council. Mr. Chilvers pointed out, in reply to Mr. Macmoran's argument, that an external wall was defined in sec. 5, sub.-sec. 15 of the Act as an outer wall, or vertical inclosure, of any building. Therefore, section 14, he submitted, applied to either the front, flank, or rear of a building, and, further, that under the section in question it was provided that the Council should serve the notice on the builder, and under these circumstances he submitted that they were the proper authority to take the proceedings. The magistrate, Mr. Marsham, adjourned the summonses to the 29th inst.—At the Woolwich Police-court, on the 20th inst., Mr.

Ruggles, a builder, of Plumstead, appeared to a summons taken out at the instance of the London County Council. Mr. Chilvers, from the Solicitor's Department, supported the summons, and Mr. Morton Smith, barrister, defended. Mr. Chilvers stated defendant was summoned for commencing to form and lay out a street for carriage traffic without the sanction of the Council, contrary to section 7 of the London Building Act, 1894, for which he had rendered himself liable, under sec. 200, sub.-sec. 1, to a penalty of £10. Mr. Perkins, a surveyor in the office of the Council, was called, and produced a plan, showing two houses erected on a piece of land between Piedmont and Ancona roads, Plumstead, which he stated had been erected by defendant, who told him other houses were to be erected, making ten in all; but no application had been made to the Council for their sanction to the formation of the street. In reply to Mr. Morton Smith, the witness admitted that Mr. A. H. Kersey had given notice to form the street in September, 1891, before the passing of the London Building Act; but he denied that there was any road on the land at the time he made his survey. Mr. McHugo, assistant surveyor to the Plumstead Vestry, produced an application made by defendant to drain ten houses, as shown on deposited plan, and in reply to Mr. Morton Smith, stated excavations had been going on on the land in question for several years. Mr. Smith intimated his case would be that the street was commenced to be formed before the Act was passed, and therefore the Act did not apply to it. The magistrate, Mr. Marsham, said he thought it was a matter that might be arranged, and he adjourned the summonses for four weeks, intimating that it would be well for defendant to make an application to the Council in the mean time.

## WATER SUPPLY AND SANITARY MATTERS.

**METROPOLITAN WATER SUPPLY FROM WALES.**—The London County Council discussed at good length, on Tuesday, a special report by the Water Committee on the proposal to bring a supplementary supply of water to London from Wales. The report recommended that they should be instructed to continue the surveys of the valleys of the Usk, Wye, and Towy, and to prepare plans in order to enable the Council to apply to Parliament in the Session of 1897 for powers to carry out the Usk and Llangorse section of the scheme, together with the requisite conduit to Elstree, and for powers to purchase such sites for reservoirs. They asked for authority to expend a sum of £10,000 in relation to this matter, and stated that this section of the scheme proposed to be carried out would supply 182 million gallons a day, the estimated cost being £17,462,750. The subject was adjourned for three weeks, till March 17.

## CHIPS.

An extraordinary turn of affairs has arisen in connection with the proposal of the town council of Lancaster to spend £70,000 on the proposed Blea Tarn reservoir. A provisional order has been granted, but the Local Government Board are withholding borrowing powers.

Contracts were accepted on Wednesday for the work of erecting a new church at Rosemount Viaduct, Aberdeen, for the St. Paul-street United Presbyterian Congregation. The cost of the building will be upwards of £4,000.

At the Royal Hotel, Blackpool, on Friday, Mr. John Ashley, who was the clerk of works during the erection of the gigantic Tower at that watering place, was presented by the contractors and officials of the undertaking with an illuminated address, gold hunter's watch, ivory rule, and a purse containing £64, in recognition of his patience, judgment, and ready resource during its erection.

A marble memorial of the late George Moore, of Cheapside, was unveiled on Wednesday at the Royal Free Hospital. The tablet is the work of Mr. John Adams-Acton, and is a replica of one executed by the same sculptor for Carlisle Cathedral.

The district of Columbia is to have an Episcopal Cathedral, designed by Mr. Ernest Flagg, of New York. By desire of the trustees, two designs were prepared, one in Gothic and the other in Renaissance style, and the Renaissance design was chosen. The building, as planned, is to be 272ft. long, and 200ft. wide, and is to have a dome 280ft. high, and four towers, each 312ft. high. It is expected that the church will cost nearly three million dollars, and about a million more is to be expended upon a bishop's palace, a deanery, a boys' and girls' school, a chapter-house, and other buildings, which will form a part of the group.

The Sculcoates (Hull) Board of Guardians on Tuesday decided to purchase three plots of land on the Hessele-road, at Hull, comprising 2¼ acres, for £2,850. It is intended to build thereon cottage homes for the reception of the workhouse children.

## Our Office Table.

PROFESSOR W. B. RICHMOND, R.A., in lecturing at the London Institution, Finsbury-circus, on Friday night, on his work in "The Decoration of St. Paul's" stated that there have now been completed in the choir nearly 10,000sq.ft. of mosaic, exclusive of the gilding and painting of the barrel vaulting, of the design upon the stonework, and exclusive also of the windows. This includes a figure of The Majesty in the centre of the apse, on either side two groups of recording angels; two panels of the Sea giving up its Dead; six panels of Virtues; the Sacrifice of Noah after the Flood, the meeting of Abram and Melchizedek; the creation of the birds, the creation of the fishes; the creation of the beasts; 12 herald angels proclaiming the prophecies from Chapter IX. of Isaiah concerning the coming of Christ; colossal figures of Sibyls, the Persian and the Greek; similar figures of David and Solomon, of Alexander and Cyrus, of two of the builders of the Temple, of Moses receiving the Law on Mount Sinai, of Job and his friends, of Jacob's Ladder, and of Abraham outside his tent, when visited by angels promising him a son; three windows in the apse, and six clerestory windows representing angels singing in Paradise; and allegorical figures of Adam and Eve naming the beasts. There have also been completed panels of peacocks, panels of fish, and panels of beasts, as well as panels of arabesque designs representing various Oriental flowers and fruits. The whole of the vaulting down to the main cornice of the choir will be completed by Easter, and there will then remain six spandrels to be finished, which will be accomplished before Easter of next year.

At the meeting of the Wiltshire County Council, held at Trowbridge last week, a long discussion took place on a motion by Mr. J. C. Powell, that the labourers engaged upon main roads and directly employed by the council should be paid a minimum wage of 16s. per week. Mr. King, in seconding the motion, pointed out that the council did not deal in a niggardly spirit with regard to the wages of their officials, and they ought to act in a similar manner in regard to the wages of those who were employed in manual labour. A clergyman, the Rev. J. S. Thomas, proposed as an amendment to substitute 14s. for 16s., on the ground that this would more nearly correspond with the wages paid by farmers in the district. On a division being taken, there voted 11 for Mr. Thomas's amendment, and 32 against it. The voting was exactly similar on another amendment, to insert the word "able-bodied" before "labourers" in the motion. The original proposition moved by Mr. Powell was then put and lost by a large majority, only six voting for it whilst 35 hands were held up against it. Thus the amendments and resolutions were defeated by large majorities, and the road labourer in Wiltshire is left with a minimum wage of 13s. a week.

THE Weather Bureau of the Department of Agriculture of the United States advocates the use of flat tapes of copper for lightning conductors, in preference to the tubular or solid rod form, of a weight of about 6oz. to the foot, or if of iron about 36oz. Professor Lodge's advice is endorsed—viz., that the conductor should be connected with the water or gas mains, if it is near them; but independent ground is preferred. Masses of metal in the building should be put into electrical connection; but the conductor should avoid proximity of small fusible gas-pipes. Groups of two or three points along the ridge-rod are recommended. The same authority denies that the "area protected is one of a radius equal to twice the height of the rod from the ground," and observes that no definite area exists. Chimneys and fireplaces are dangerous places; but it is contended that the idea of a path of least resistance for the current is not proved, as any part of a building is liable to be struck, whether there is a conductor or not. To the latter assertion we must take exception, and experience has proved the contrary.

Morland Church, in Cumberland, is to be restored at a cost of £1,185 5s. 3d. The contract, which has been let to Mr. John Edmondson, of Morecambe, includes new roof, new oak seats, a thorough renovation of the walls, new floor, and repair of tower and spire. The work is to be finished by September.



## MEETINGS FOR THE ENSUING WEEK.

- MONDAY.**—Society of Engineers. "The Mechanics of Horse Haulage," by T. H. Briggs. 7.30 p.m.  
Surveyors' Institution. Discussion on "The Conditions of Building Contracts." 8 p.m.  
Royal Institute of British Architects. Business Meeting. 8 p.m.  
Society of Arts. "The Chemistry of Certain Metals and their Compounds Used in Building," Cantor Lecture No. 3, by Professor J. M. Thomson, F.R.S. 8 p.m.  
**TUESDAY.**—Institution of Civil Engineers. "Littoral Drift in Relation to River Outfalls and Harbour Entrances," by W. H. Wheeler. 8 p.m.  
Society of Arts. "The Commercial Prospects of East and Central Africa," by G. Scott Elliott. 8 p.m.  
**WEDNESDAY.**—Royal Archaeological Institute. "Feathers and Plumes," by Viscount Dillon; "The Possible Arabian Origin of Gothic Characters," by H. H. S. Cunyngame. 4 p.m.  
Carpenters' Hall Free Lectures. "Electricity in Connection with Buildings," by W. H. Preece, C.B. 8 p.m.  
Society of Arts. "Röntgen's Photography of the Invisible," by A. A. Campbell Swinton. 8 p.m.  
Glasgow Architectural Association. Annual Business Meeting.  
**FRIDAY.**—Architectural Association. "Practical Stonework," by Hervey Flint. 7.30 p.m.  
Auctioneers' Institute. "Valuations and Appraisements," by A. J. Ram, Recorder of Hanley. 9 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

## EXAMINATION FOR MEMBERSHIP.

The Examination for Admission to Membership of the Society of Architects comes into operation on NOVEMBER 1st, 1896.  
The Subjects of the Examination to be held by the Society are as follows:—

- Section I. ARCHITECTURE.**  
Subject (a). *Planning and Design.*—The plan and design of some building, or portion of a building, with details to a larger scale.  
Subject (b). *Architectural History.*—The general principles of the various styles and periods of Architecture; their details, mouldings, and enrichments.  
**Section II. BUILDING CONSTRUCTION AND MATERIALS.**  
Subject (a). *Construction.*—Constructional details in all trades.  
Subject (b). *Materials.*—The properties, methods of working, manufacture, and the application of materials to building work.  
**Section III. PRACTICE.**  
Subject (a). *Specifications.*—Preparation of specifications, and the examination of Builders' accounts.  
Subject (b). *Contracts.*—The conditions pertaining to a building contract; the relative positions of architect, client, and contractor; and other questions of ordinary practice.  
Subject (c). *Sanitary Science.*—To include water supply and drainage, ventilation, lighting, and heating of buildings.

## ALTERNATIVE EXAMINATIONS.

The Council accepts, in lieu of the Society's own Examination, certain Examinations as partly or wholly alternative. Full particulars of these and of the Synopsis of the Examination will be published shortly.

ELLIS MARSLAND, Hon. Sec.

St. James's Hall, W., December, 1895.

A new reredos was last week unveiled at St. James's, Upper Edmonton. It is constructed of white and coloured alabaster, Caen stone, and marble. It has been executed by Messrs. Jones and Willis, under the direction of Mr. Edward Ellis. In the centre panel is a marble cross on a background of alabaster, and in the panels on either side are carvings, in alabaster, of the Lily of the Incarnation and Passion Flower of the Atonement, and of the Wheat and the Vine of the Eucharist. The apsidal sanctuary at St. James's, built in 1851, was decorated a few years ago.

Mr. John Bennet Delaney, J.P., of Birkenhead, died on Tuesday, aged 54 years. He was apprenticed to a cabinet-maker in the town, and afterwards established the large furnishing businesses in Birkenhead and Liverpool. For nine years he served on the town council, but retired in 1893.

The Duke and Duchess of York will visit Salford on March 25, for the purpose of opening the new Technical Schools at Peel Park. The schools are built of red brick and terracotta, have cost £55,000, and will accommodate 2,000 students. Mr. Henry Lord, of Manchester, is the architect.

At Leicester, on Thursday in last week, Frederick Charles Tyers, son of a master builder, who has been living with his father, followed him out of the house as he was on his way to work, and, running a few yards in front, committed suicide by cutting his throat before Mr. Tyers could interfere to prevent him. The man was said to be in financial difficulties.

Arthur John Straker, a builder, of Cudworth, who is a member of the Barnsley rural district council, was charged before the Barnsley magistrates on Wednesday week, at the instance of George Harry Gray, a property agent, "that he, being a member of the said council, and being disqualified, by reason of his having been concerned in the profit of a contract for certain work done for the council at Carlton, did vote in the council, contrary to statute." The Bench convicted, and imposed a fine of £5 and costs.

## Trade News.

## WAGES MOVEMENTS.

**NEWCASTLE-ON-TYNE.** At a meeting of the members of the Master Builders' Association held at the County Hotel, on the 19th inst., to consider the dispute at present existing between the plasterers and bricklayers as to the laying of cement floors, the following resolution was unanimously adopted:—"That in future the employers will use their own discretion as to whom they will employ to lay cement floors." There was also a strong feeling expressed against the action taken by the Bricklayers' Society in withdrawing their men from certain works, as there is no dispute at present existing between the employers and the bricklayers. It was also felt that steps should be taken by the Masters' Association to take immediate united action upon the recurrence of such disputes.

## CHIPS.

The Corporation of Bury, Lancs, applied to the local bench on Friday for an extension of two years in which to carry out its sewage works. The town clerk said contracts had been let to the amount of £60,000, and the works would require that time to complete. Mr. Wilson, on behalf of the joint committee, opposed, and said, filtration works could be carried out simultaneously with the other works. The Bench granted an extension of twelve months.

The Coventry Corporation decided on Tuesday to carry out the repaving of the principal footpaths of the city with artificial stone. The surveyor estimates the cost at £13,000. The work will be spread over several years, £1,000 being set aside annually for the purpose.

Colonel J. O. Hasted, R.E., and Mr. E. P. Burd, Local Government Board inspectors, held an inquiry at Wolverhampton on Tuesday, with regard to an application which has been made to the town council for a provisional order to repeal, alter, or amend various local Acts, so as to provide for the extension of the waterworks undertaking; enable the corporation to borrow money for that purpose; and enable the corporation to make provision with regard to closets on the water-carriage system.

The district council of Friern Barnet recently called upon Mrs. Gooday, of High-road, Whetstone, to take her water supply from the company which supplies the district. She declined to do so, on the ground that she had a good supply from other sources. Thereupon the council sent men to lay on the water, and Mrs. Gooday refused to admit them. For this she was summoned before the Highgate magistrates on Monday, the charge against her being one of "obstruction," under the terms of the Public Health Act, 1875. The Bench decided that the local authority could not force an entry without a magistrate's order, which in this instance they had not obtained. The summons was therefore dismissed.

The collection of pictures formed by the late Mr. James Cowan, of Glenorm, was sold on Saturday in Edinburgh. Good prices were realised, the principal being:—"Erskine Nicol, A.R.A., 'A Wheeler,' £388 10s.; and 'The Renewal of the Lease Refused,' £567; Sir J. Noel Paton, R.S.A., 'Fact and Fancy,' £299 5s.; 'Christ and His Disciples at Gethsemane,' £105; Sir George Harvey, P.R.S.A., 'Inverarnan, Head of Loch Lomond,' £168; Peter Graham, A.R.A., 'Twilight after Rain,' £210; A. Tideman, 'Grandmother's Crown,' £283 10s.

A serious fire occurred on Monday in the large builders' and contractors' yard in Love-lane, Shadwell, owned and occupied by Messrs. Ashby and Horner. Before it could be got under, it had destroyed a range of buildings covering an area of 120ft. by 90ft., besides doing much damage to adjoining workshops and to a large number of houses in the neighbourhood.

The parish church of Lawrence Kirk, N.B., built in 1804, was reopened on Sunday after restoration, including reseating, new oak pulpit, an organ built by Messrs. Wadsworth Brothers, of Manchester and Aberdeen, and a memorial stained-glass window. The works have cost £1,700.

At a meeting of the parishioners of Christ Church, Newgate-street, E.C., held on Wednesday, resolutions were passed approving a scheme for reseating and restoring the parish church, at an estimated cost of £1,000. A committee was also appointed to raise the necessary subscriptions.

A survey of Doncaster parish church, recently injured by a gas explosion, has been made by Mr. Brierley, and Mr. Hunt has estimated the damage done to the stained-glass. The damage in the nave is estimated at £1,900, and in the chancel, £100. Messrs. Abbott and Smith have estimated the damage to the organ at £157, and 10s. for expenses in holding services at the Corn Exchange bring the total damage to £2,167 10s.

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## TENDERS.

\* Correspondents would in all cases oblige by giving the addresses of the parties tendering at any rate, the accepted tender: it adds to the value of the information.

**BARNESBY.** For alterations at the Waterloo, for Mr. J. H. Malin. Mr. Edward Brown, M.S.A., Fleur-de-Lys-street, Bishopscote, architect:—

Beedham	£342 0 0
Wenham	336 0 0
Lancaster, E.	318 0 0
Easton	293 0 0

Burley	89 0 0
Grimes and Son	77 0 0
Rogers and Son	69 10 0

**BECKENHAM.** For building new public room and sundry alterations and repairs to the Greyhound p.h., Beckenham, for Whitbread and Co., Ltd. Mr. Albert L. Guy, F.R.I.B.A., Bedford Row House, W.C., and 76A, High-street, Lewisham, S.E., architect and surveyor:—

Simes and Duncan	£695 0 0
Graham	690 0 0
Jerrard	583 0 0
Kenward Bros.	580 0 0
Knight, T., Sidecup (accepted)	550 0 0

**BERKHAMPTSTEAD.** For sewerage and sewage disposal works, Berkhamptstead. Mr. James Lemon, M.Inst.C.E., Lemon and Blizard, 9, Victoria-street, Westminster, engineer:—

Free, T., and Son, Maidenhead	£1,970	£6,600
Raynor, C. G., Liverpool	7,650	5,650
Taylor, G., Blackburn	7,569	4,217
Adams, Wood Green	6,890	4,800
Jackson, J., Plaistow	6,700	4,400
Bell, G., Tottenham	6,253	4,356
Siddons and Freeman, Oundle	5,990	3,900
Cooke, B., and Co., Battersea	5,743	3,732
Uncliff, W., Kingston-on-Thames	5,561	3,895
Bentley, J., Preston	5,358	3,375

A.—Contract A. B.—Contract B.  
Engineer's estimate, £6,000.

**BERMONDSEY.** For the erection of new Baptist chapel, Iderton-road, Bermondsey, S.E. Mr. G. Baines, F.R.I.B.A., 4, Great Winchester-street, E.C., architect:—  
Battley, Sons, & Holness (accepted) £3,777 14 0

**BERMONDSEY.** For the erection of factory at Bermondsey, for Messrs. C. Wix and Sons. Mr. J. W. Brooker, F.R.I.B.A., 13, Railway Approach, London Bridge, S.E., architect:—  
Battley, Sons, and Holness £5,832 0 0  
Edwards and Medway (accepted) 5,027 0 0

**BRIGHTON.** For additional classrooms, &c., to the Bentham-road Mission Hall. Mr. E. J. Hamilton, architect. Quantities supplied:—

Taylor, W.	£900 0 0
Barnes, J.	386 0 0
Lockyer, G. R.	682 15 0
Sattin and Evershed	657 0 0
Saunders, J. J. G., and Sons	554 0 0

\* Accepted. All of Brighton.

**CARDIFF.** For erection of annexe to the Exhibition Buildings, Cardiff, for Spiller's Nephews Biscuit Co., Ltd. Messrs. Veal and Sant, architects:—  
Symonds, W., and Co. (accepted) £462 0 0

**CATFORD.** For work in underpinning Riverview, Catford Hill, for Mr. E. Silverthorne. Mr. Arthur L. Guy, F.R.I.B.A., Bedford-row House, W.C., and 76A, High-street, Lewisham, architect and surveyor:—

Nicolls, G., Catford (accepted)	£200 0 0
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## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2148.

FRIDAY, MARCH 6, 1896.

## "UP-TO-DATE" BUILDING.

WE have an "up-to-date" architecture, as in everything else. It declares itself in the monster fashionably-appointed hotel, in the latest trade emporium of the universal store, as well as in the flaunting restaurant of our great thoroughfare. The commercial spirit dominates the movement, for the obvious motive is to supply the latest demand, and to give all that the most exacting taste requires. There is something to be said for the desire to be up to date. If it means that we should keep pace with the wants of the age, and make use of the materials we have at our command, it is certainly a laudable intention; but it means a great deal more—it seems to us to be retrospective, as well as looking forward, two unquestionably good motives when dictated by common sense, but extremely mischievous when they are controlled by caprice. There is up-to-date-ism in "style," as well as in construction. In the former case, it is too often the forcing upon us of mere forms and types that have grown fashionable, of features that are quaint or grotesque, without being convenient, of windows that obscure the light, of staircases that are awkward, and of chairs and tables that cannot be sat on or used with any comfort. They have been introduced into Lord Tom Noddy's house, and so they are *chic*. Really and honestly, of course, it is misleading to call that "up to date" which is "harking back" to an old period, and it is this misuse of the term which renders so much modern work ridiculous. Every true style should be up to date, but copying an old style is mere affectation. Then, again, in the second sense, in which the term applies—that of construction—it too frequently means not the best or the most suitable, but the latest novelty, the most daring innovation; and this, to our minds, is much the more offensive of the characteristics of up-to-date architecture. We can tolerate a Late Gothic or Tudor window, but we utterly repudiate a modern glass and iron shop-front, though it may be thoroughly up to date in its fittings. Everything may be done to make it convenient—the iron girders may be ceiled underneath and invisible; the iron columns may be so disposed as not to be in the way of customers or conceal the show, and be cased in deal and shelves for the display of goods; but for all this, the impression is made on our mind that the engineer and glass merchant have only been doing their "best"—would it not be truer to say worst?—in a clumsy manner, to advertise their wares or their patented improvements. They are thrust upon our attention in a most aggressive fashion. A large, coarsely-modelled capital of cast iron sprawls out below the ceiling surface without even a decent architrave. The upper part of the window is filled with execrable coloured glass, leaded in; within the shop are incandescent electric lights, with up-to-date glass globes. The cash of the purchaser is transmitted by a suspended "track" in mid air, "light-railway" fashion, and what little of wall and ceiling are visible is smothered over with some up-to-date embossed decoration. These are all inventions which the modern shopkeeper or caterer thinks he must have and exhibit, to show that his establishment is abreast of the time. In the latest hotel and restaurant this officious kind of architecture is equally obnoxious. The promoter strives to obtain all that modern

invention can give, and the architect is obliged to gratify his taste. A quantity of "new things" are introduced in the shape of fittings, appliances, and decorations, and these in an undigested form are obtruded before the public. Up to date they may be, but they do not show any artistic sense of fitness or good taste. A complete want of incorporation with the building is felt. Would such have been possible if the architect had intercourse with the workman and tradesman, and had something to say on these matters?—if, instead of merely specifying such and such details, he had been free to select what he thought best? As Mr. A. Dixon said at the Birmingham Architectural Association the other day, the great difference between ancient and modern building was that, whereas, in the old days, architect, builder, mason, and carpenter worked in intimate relationship, now they do not; every "workman is continually changing his master and his style," and is little more than a soulless machine. The modern building is becoming a promiscuous jumble, in which tradesmen and manufacturers exhibit their wares and fads, in which they have been let loose without restraint. This seems to be the modern specification way. Each craft provides what is specified, and takes care that the architect is not consulted; if there are no details, so much the easier for his conscience. The shop-fitter, the lift-maker, the ironmonger, and electric-light engineer each provides his own work, and in his own manner. Can we be astonished when the "up-to-date" building is always done by contract, in which the work has to be completed in a few months or weeks, under a heavy fine?

The modern office building, the residential block of flats, and the domestic villa are particular instances of this aggravated modern quality. The promoter of the great city office building advertises that it is "replete with every modern convenience," that its sanitary condition has been certified by a Sanitary Protection Association, that its electric lighting installation is perfect, &c. These are recommendations which nowadays go much farther than any architectural qualifications or any convenience of plan. The latest residential dwellings company set out in their prospectus that every modern requisite is provided: hydraulic lifts, the latest improvements in fireproof construction, electric lighting, telephonic and other communications. The furniture is of the latest pattern, manufactured by Messrs. Walnut, Veneer, and Co.; the decorations have been designed by the Carving Imitation and Art Supply Association, while in the way of ironmongery the Artistic Cast Iron Company have introduced the new craze in slow-combustion and ventilating stoves, door furniture, fasteners, and other things which have certain undesirable qualities, adding to the labour of cleaning and polishing, besides being perplexing and irritating to the servants of the establishment.

The modern dwelling-house and villa, whatever style it may affect to assume—Gothic, Renaissance, Queen Anne—must be fitted and furnished in the newest manner: its lobby is of tessellated tiles, and its walls of art faience; the front door must be of the latest description of panelled or leaded glazing; it must have a knocker of the correct type, whether Gothic or Flemish, a door-knob and handle of the latest brass pattern, with electric-bell pushes of the newest type. If we go inside, the vestibule or hall displays the most recent of modern hall-furniture in the shape of table and chairs, cloak and hat-stand, and stove; each of these things is up to date, made of iron, mahogany or walnut, or bamboo. Of actual comfort or cosiness there may be little; but they are the conventional and regulation furniture of Tottenham Court or Curtain roads. The internal fittings of bath-rooms and lavatories, kitchen, scullery, &c., are of a kind which satisfy the

most exacting tenant and his gentle spouse, but we must not examine them too closely. They are of the sort which give the most satisfaction to the not very critical public. As for the grates and overmantels, ceiling and wall decorations, the main idea that runs through them is to "supply the felt want"—something that is sufficiently obtrusive on the eye that will be sure to draw the attention of Mr. and Mrs. Spriggins when they pay a visit, and for this purpose elaborate and showy patterns and colours, have the advantage. Embossed materials for dadoes, for "fillings" and ceilings, are, for example, sure to obtain preference over carved wood panelling, or modelled plaster; the ceiling must be tinted rather than left plain white. The latest grate pattern and overmantel must be made not only with special reference to combustion and the reception of bric-a-brac, but be replete with painted tiles, polished brass andirons, bevelled glass, and this desire for redundancy appears to distinguish the modern fashionable interior.

The up-to-date specification is a make-up of trade catalogues and ordinary phrases, which are supposed to cover a great deal that is not specifically stated. The illustrated catalogue and price list appeal specially to the wants of this class of architecture; in fact, we hardly know how a modern architect can acquit himself of his task without knowing the latest materials and novelties in construction. The manufacturers' advertisement is a part of his equipment. To know the latest things in the shape of brick and terracotta, plaster and cement, artificial stone, fireproof construction, ventilators, fastenings, sanitary fittings, lighting arrangements, and decorative materials, has become an indispensable branch of the architect's knowledge. A great deal is to be learned from the manufacturer's point of view, why such and such an improvement has been made. He knows probably better than most people what is likely to suit the public, and what defects have been discovered, and therefore his list of specialities form a sort of *précis* specification. We do not mean to say it is desirable to specify every new thing that is advertised; discrimination and judgment are absolutely necessary, and it is owing to the lack of these qualities that we find so many architects and builders introducing "new" fittings and materials which turn out to be inferior to the older methods. In the modern hurried building, the stock pattern or casting finds favour with the builder, and thus we see so much that is coarse and redundant used, and so little attention is paid to the proprieties of design. What else can be expected when the workman is not much better than a machine, and the building the result of working against time at the lowest possible cost. We cannot expect anything better till the barriers between the architect, builder, and workman are removed, and buildings of the kind we have mentioned are intrusted to men who desire to place good design and efficiency before a spurious affectation of completeness and novelty.

## DOMES, AND HOW TO CARRY THEM.

THE dome in our times is generally a mere piece of scenery. It is meant, no doubt, to last a little longer than the imitative architecture which night by night goes on and off the stage; but it is essentially of the same kind. It is not a reality, but the mere representation of one. Sometimes in wooden cradling and plaster, sometimes in iron ribs and fibrous slabs, and sometimes even in *papier-mâché* and paint. Of course, we are referring in this article to internal domes, and not merely to dome-shaped roofs, like those of many Renaissance buildings. It is an odd thing that the very same architects who would condemn without mercy a lath-and-plaster copy of stone-groining, have no



compunction in inflicting on us any number of lath-and-plaster domes. Of course, they shelter themselves behind Wren's example. Wren, like other great men, did many things which he ought to have been, and perhaps was, ashamed of, and in these everybody can copy him. We cannot all build a series of stone domes like those over the crossing and down the nave of St. Paul's; but we can all construct, if not design, the sort of sham domes with which he ceiled so many of his City churches. Real domes, it is true, were never built every day. When building was regulated, not as now, by the caprices of clients, whether ignorant or amateurish, but by the matured judgment of the artists who practised it, great ideas were kept for great occasions. They were not profaned and vulgarised at every street-corner. Daily life, with its transitory affairs and trivial amusements, had a graceful and not too formal architecture of its own. It was content to be itself, and to set off by contrast whatever belonged to high and permanent things. So it comes to pass that, till late in the Renaissance, the dome belonged chiefly to the temple, the church, and the mosque.

Mr. R. Phené Spiers has just read at the Institute a very interesting paper on Medieval domes, dealing chiefly with those of Central France, which have for about half a century been regarded as practically Byzantine. Mr. Spiers, on the contrary, considers them to be an indigenous outgrowth from the French Romanesque style, and gives weighty reasons for thinking so. The facts he has collected make it very improbable that Byzantine workmen were employed on them. They rather suggest that the French builders of the 11th and 12th centuries had heard of, and in some instances perhaps had seen, the domed structures of the East, and that, without knowing much of their details, they managed to reproduce them—with modifications and improvements—in a way of their own. In some respects, such as the pointed form of the arches on which these French domes rest, and the pointed or ovoid section of these domes themselves, they resemble rather the oldest mosques at Cairo than the Christian churches of Constantinople. It is curious that the obvious points of affinity between the architecture of La Charente and that of about the same period in Lower Egypt seem to have attracted so little notice.

These, however, are antiquarian matters; but the paper we have referred to also deals with some extremely practical ones, which have not before been brought out so plainly in any work which is generally accessible. They relate principally to the way of supporting the dome. In such a case as that of the Pantheon, where a dome, circular on plan, covers in a circular building, there is, theoretically, no difficulty about it. If the wall is thick enough to bear the weight and to counteract the thrust, there is nothing more to be considered. But suppose this circular dome has to be built over a square space of the same diameter; then it only rests directly on the walls below at four points—one in the middle of each side of the square—and the question is how to support the rest of it. There have been various solutions of the problem. Without attempting to take them in chronological order, we may note that one is to throw arches across the angles of the square, thus forming an octagonal base,\* which fits the dome much better. Yet even then the transition from the octagon to the circle is hard to manage, not so much structurally as artistically. It is accomplished (from an irregular octagon to an elliptic dome) in the centre of Pisa Cathedral; but much more frequently these octagonal *tambours* lead to octagonal domes, and we thus lose the peculiar beauty of the dome at its best. St. Sergius, Constanti-

nople, shows us a kind of sixteen-sided dome coming down on an octagon, and San Lorenzo Maggiore, Milan, an octagonal one resting on a square, with each angle filled in by a series of gradually-widening segmental arches, one above another. But arching is not the only way in which the angles of a square can be filled in. Except on a very large scale, corbelling, by means of oversailing courses, is just as easy, and perhaps stronger. At least, it is so if we have wide flat stones to work with, which will bond far back into the walling, and reach across, at least in their lower courses, from one side of the square to the adjacent one. Still, we have the same difficulty here that we had with the oblique arches: we end by producing an octagon, and our round dome does not sit comfortably on it. The design does not look all of a piece: there is an abrupt break where the octagonal plan ends and the circular plan begins.

It was felt, in very early times, that this break would not do. To make the dome octagonal on plan was to sacrifice too much. Then why not keep it circular, and bring the whole composition into harmony by making the filling-in of the angles below it circular too? This was a flash of genius, and it issued in the invention of what is called the "spherical pendentive." We find it, in very early times, and on a vast scale, at St. Sophia, Constantinople, and thenceforward the same type, or variations on it, may be traced all through the Byzantine Empire, in Egypt, Syria, Persia, in 11th and 12th-century France, and finally in Renaissance work everywhere. In all these cases it looks much alike; but the construction differs, and Mr. Phené Spiers has told us several facts about their construction which are very important. The bedding of the courses in Byzantine pendentives, he states, is not horizontal. The beds are not always at right angles to the curve; but still, they are not level. The pendentives, if not truly portions of a dome—as many writers say they are—seem to be constructed more or less on domical principles. But in the earliest domes of Central France this is not so. The pendentives which carry them are really corbels scooped and hollowed to a dome-like surface, but actually worked in oversailing horizontal courses, like the squinches which support the oblique faces of a spire. This fact—though Mr. Spiers does not say so—possibly explains another peculiarity of these French domes. Their inner face is set back, at least in the largest of them, from 18 in. to 3 ft. behind the face of the pendentives which carry them. In Byzantine examples this is not so, and if the Byzantine pendentives were structurally parts of a real dome, there was no reason why it should be so. As long as their outward thrust was provided against, they were quite able to carry the dome above, and there was no danger of its overbalancing them and falling inwards. But when the pendentives are a mere corbelling or oversailing, such a danger arises at once, and it becomes greater the greater the width of the dome is. A corbel built of oversailing courses, when its projection exceeds a certain amount, tends to fall away from the wall to which it is attached. As long as its stones "tail" right through the work behind, it is perfectly safe. But it wants a weight on the back of them to prevent the weight on the front of them from tilting them up; and the further the corbel oversails, the harder it is to get this weight on the back. A point is soon reached at which the corbel stones are not long enough to tail through in one piece. Then artful ways of bonding have to be resorted to, along with dowels and cramps, and in modern work along with that never-failing friend of the unscientific builder, Portland cement. In the 11th and 12th centuries, however, Portland cement was still unimagined, and the constructor trusted mainly to mechanical

devices. One way of making his corbelling stronger was to push the weight that rested on it farther back, and this perhaps was how he came to set the inner face of his dome half a yard or a yard behind the inner face of the pendentives which carried it.

The obvious and striking distinction of the early French domes was, of course, that they were ovoid instead of semicircular in their vertical section, and that they rested on pointed arches and not on round ones. It follows from this that their pendentives were not truly spherical on the surface. Pendentives between circular arches are naturally portions of spheres. But when the arches are struck from two centres instead of one, the section of the pendentive takes the form of a reversed ogee, composed of a large concave curve below and a small convex one above. In practice, this is hardly noticeable. But such a section is evidently better adapted for corbelling over than for building as a dome, with the beds of the stone at right angles to the curve. Yet, singularly enough, one of the great 12th-century pendentives at St. Front, Périgueux, was constructed on this latter principle. In the convex part of its ogee curve, the masonry must have had a direct tendency to drop away from its backing. As builders say, "it hung up by its eyelashes"; it remained in place by what, on the drawings, looks like a miracle, though it is doubtless to be explained by artful bonding and good mortar. But it forcibly reminds us of the late Mr. Fergusson's remark, written not only after a general study of all the great domes of the world, but after a long and intimate acquaintance with those of India in particular: "It is almost as hard to build a dome that will fall, as a vault that will stand."

Very unpractical this subject will seem to our friend "the surveyor-of-all-work." And, truly enough, it is a matter in which he has neither part nor lot. It belongs to architecture—an old art which has its ups and downs, but which has not quite died out, even in our times. It may revive, as it has often done before. The day may come when somebody will want to build a dome again: a large one, and a real one. Then he will not turn to the works of the eminent Mr. Peter Nicholson, who can only show him how to pretend to build one, by the aid of lath and plaster. He will not study the attempts of our iron-rib artists—with their metal cobwebs, filled in between with glass—who, because they can get machine-made strips of metal 50 ft. long, and can have them bent, and riveted, and laid from wall to wall, fancy themselves cleverer than the men who, with only their own heads and hands to depend upon, spanned the Pantheon with stone blocks, and St. Vital, Ravenna, with earthen pots and vases. He will rather turn to such papers as that on which we have commented, and to such buildings as those which it deals with; he will forget the temporary expedients of our age of pretence, and inquire how men built in the ages of permanence.

#### CLEARED SITES AND VACANT PLOTS.

DEMOLITIONS of all kinds are proceeding apace, and the question which, above all others, suggests itself to the public mind is, What is to be done with the sites? Are the old houses to be rebuilt on a larger scale and with more care to their construction, or are dwellings for the labouring classes to be erected in their place? These questions force themselves upon us when we see such large waste areas as those in the neighbourhood of Covent-garden, Clare-market, Clerkenwell, and other parts of London. A very considerable number of the working and artisan classes must have been displaced in these localities, and proportionate crowding has been caused elsewhere. Where have the

\* Mr. Hayter Lewis describes an example of this treatment at Serbistan, which he assigns to the 4th century.



inhabitants of Drury-lane, the salesmen and costermongers, migrated? These are questions of considerable moment just now, when the Metropolis is extending its boundaries in every direction, and the facilities of communication are beginning to be taxed to their uttermost extent, and when even the nearer suburbs begin to feel the pressure of the working classes within their areas, as those of Camberwell, Finchley, Hammersmith. The statute law relating to building is supposed to provide for these contingencies; but as a matter of fact there are ground landlords who take the convenience or housing of the working classes little to heart, and who are ready to pull down whole streets without providing for the displaced population. The London Building Act, section 44, appears to have been framed to enable owners to lay out new streets on cleared areas. Such persons may make an application to the Council for making or widening new and old streets on an area previously occupied by buildings. It is true the Council may disapprove of the plans, and the Tribunal of Appeal may determine any case if the applicant feels dissatisfied; but nothing is provided to insure the housing of those tenants who are cleared out. The sections bearing on dangerous and dilapidated structures operate to cause the demolition of dangerous or neglected buildings, giving power to the L.C.C. to compel the owners to take down or secure, and the City of London Sewers Act confers similar powers upon the commissioners with respect of any dangerous or unsanitary City building. The tendency, therefore, of the existing building legislation in the Metropolis is to demolish whole acres of house-property, especially where it is dilapidated or unsanitary, and to help owners of property to clear their sites, and to make new streets—all very good things in their way, but certainly tending to drive the working population from their centres of work without providing other accommodation for them in the same neighbourhoods. It is not to be expected that the tenants of the demolished houses can afford to live further away from their daily work; they must, therefore, be transferred from one area which may have accommodated them easily, to an already crowded part near, thus aggravating the risks and dangers of disease, and making the last state of the district worse than the first.

Under the Housing of the Working Classes Act, 1890, the local authority, on being satisfied with the official representation of the medical officer of the unhealthiness of the district, can make a scheme for the improvement of an unhealthy area; the authority can give notice of their scheme to the owners, and there is a special provision as to the accommodation of the working classes. Another section provides that when it appears to the local authority that where a building has been demolished by their order, it would be beneficial to the inhabitants to convert its site to a highway, or open space, or to sell, or let it, for the erection of dwellings for the working classes, the authority can prepare a scheme for the same, or for the rearrangement or improvement of the area. If such provisions could be carried out in the case of the areas which are lying vacant and doing nothing in the Metropolis, except as places for the deposit of rubbish, the classes immediately interested would be benefited. Nothing of the kind seems to be attempted. Many of these vacant sites have remained in their present condition for months—aye, for years—and are nothing better than nuisances and receptacles for refuse of every kind. The houses in their proximity are suffering; some of them are propped up in a tottering condition. By all means convert the corner sites, if possible, to public use, either by widening the streets or making better junctions, or turn them into gardens or open spaces, and hand them

over to the Metropolitan Public Gardens Association, who can make them ornamental or agreeable oases in the midst of a wilderness of bricks and mortar. If too valuable for this more liberal policy, let them be occupied by buildings worthy of the position intended for industrial dwellings or official purposes, but with a little more regard to skyline than we are accustomed to see. Let at least some portion of the unused and waste areas be occupied by buildings or “doss” palaces of the kind we have lately described, in which common dining, reading-rooms, and kitchens are provided with cubicles in the upper floors. We cannot turn all our streets into rows of palatial hotels and chambers like those of Northumberland-avenue or Arundel-street, but we can make them equally useful and effective. There are opportunities for architectural improvement in some of them if the public authorities will stir in the matter. But as to the present useless and deplorable state of these waste and idle areas, something ought to be done. While our authorities can sweep away slums, and in many cases make the owners remove buildings, they seem to possess no power to compel them within a reasonable time to rebuild or to provide accommodation for the displaced classes.

#### “BUILDING NEWS” DESIGNING CLUB.

AN ARCHITECT'S SECRETAIRE.

FOR this subject, given in our fourth list, only two designs were received, an overwhelming number of the members of the BUILDING NEWS Designing Club preferring the other subject, A Gamekeeper's Cottage. We shall, at an early date, illustrate the two best designs for that, and to-day content ourselves by giving a reproduction of the chosen design for the Architect's Secrétaire and Chair. The author is “The Owl,” and we can congratulate him on his work, which was executed under the following conditions:—“A Fall-Down Fronted Writing Secrétaire, 2ft. 9in. wide, 4ft. 9in. high, 1ft. 4in. deep, fitted with pigeon-holes and drawers in the upper, or inclosed, part, the piece to be open below. The pull-out bearers (to carry the fall-down desk) to be made minor features of in the design, which is to be in walnut, with coloured-wood inlay enrichments, the whole treatment being adapted to the requirements of an architect. An armchair to be designed and drawn for use with the secretaire. Scale, 1in. to the foot, with some larger details and sketch. Sufficient drawings to illustrate the designs properly.” The design placed second—and we must perforce admit that it takes this position in the absence of a rival—is contributed by “Canary.” Both birds seemingly. “The Owl” is, however, seen to greater advantage judging by the merit of the two designs, which leave practically no other choice than that here made. The drawing illustrated furnishes a working detail sheet, and as the parts are so manifestly displayed, there remains little to say about them. Refinement, straightforward construction, and simplicity are all qualities of the first consequence, and these “The Owl” may claim, as evinced by his design, for this quaint little piece of furniture. The lions' heads, with pull-out rings to carry the fall-down front, are precisely what we had indicated, though possibly the idea may not actually merit much novelty in design. The carving is conventionally treated and well drawn, but we would draw attention to the likelihood of the face of the fall-down front becoming marked in an unintentional way by the nose of the lion, unless a modified angle is given given to the proboscis of the animal, or a metal plate attached to the front at the point of contact with the bearer when it is opened for writing on, and even then, unless the bearers were pulled out to the fullest extent, it would scratch the front. The inlay is not overdone, and what there is is distinctly pretty. By avoiding a more florid scheme, commendable reserve is shown; but a difficulty, too, of extended treatment is also escaped. “Canary” has fallen into this trap, and consequently renders himself more liable to criticism. Intarsia work is exceedingly attractive; but, unless skilfully managed, soon becomes vulgar, and sinks into the commonplace. Good drawing is of the utmost consequence, with a due regard to the sweetness of form, not only in the pattern

itself, but in the voids it leaves. Moreover, no quantity of enrichment will ever compensate for poorness of form and lack of idea in the general character of the object decorated. This elementary and self-evident condition is ignored, perhaps, more than any other, and the notion seems as popular as ever that, by introducing ornament, the quality of art is secured. It is the old, old story, and on every hand every day its prevalence is painfully conspicuous. As a reaction, barbaric forms and uncouth constructions obtain admirers among the cultivated exclusive, so that “dab and wattle” filling with half-timber work is advocated for modern drawing-rooms and common ledged doors are put up in parlours. The two extremes surely miss good taste, which never aims at distinction by becoming merely peculiar—a quality nearly always bespeaking the faddist, whose aim is to be thought in “the know” as an eminently superior person. The wiser course may end in the commonplace; but, even then, that is not necessarily offensive, and, after all, to be only queer is hardly ever convincing, while good honest work is always durable and lasting. “Canary” blocks out his “secrétaire” with jamb-like panelled uprights, so that at first sight his design looks more like a mason's chimney-piece. The projecting shaped trusses, brought forward like dwarf buttresses in front, would be always in the way of the user, and the spring-contrived flap is more ingenious than useful. His triangular chair on the “as you like it” principle is ungainly and inconvenient without having the merit of good looks.

#### CAST-IRON COLUMNS.

EVEN when the most careful calculations have been made, and the details have been scrupulously worked to, cast-iron columns are sometimes subjected to improper treatment before being fixed on buildings, which may seriously impair their strength and safety. The *American Machinist* refers to the attempt made to straighten columns which were not true by heating and bending them by placing them on their convex side up over a fire and loading by pig-iron, the effect of which treatment was to stretch the iron on the lower side and make it thinner, and to render the column in one case weaker under a dead load. An attempt made to straighten a column by the reverse process, of placing the concave side up and loading the overhanging ends, and then applying the fire underneath the centre of column, is said to have been attended with better results, as it “permits the column to be made stronger instead of weaker,” as the heating thickens the side of the column which has been stretched. It cannot be denied that any tampering with cast iron must be riskful, as the reheating and loading tends to develop internal strains in the metal. That cast-iron columns are sometimes subjected to such treatment to straighten them is to be feared. Architects and engineers probably know little of these processes; the columns thus strained are set up, and loaded to a degree which may be dangerously near the breaking point. We think it is well that those intrusted with the ironwork of our buildings, engineers and inspectors, should be aware of these endeavours to rectify cast-iron columns and girders, and refuse to accept all constructional ironwork that has been subjected to these processes. The action of heating a column or a girder at a particular point, and then subjecting it to strain, must necessarily tend to cause internal elongation of some fibres and compression on others, causing unequal power of resistance, or even fracture. The metal also on the heated and compressed side must be increased, while that on the contrary side is made thinner; and this unevenness, under certain conditions of loading, would be really dangerous.

#### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XII.

By ERNEST A. E. WOODROW.

THE seaside casino, with its theatre, concert-hall, assembly-rooms, &c., has nowhere been carried out with greater magnificence than at the far-famed Casino of Monte Carlo. No excuse seems necessary to explain why this building should find a place under the heading of “Concert-Halls and Assembly-Rooms,” for it is one of the most celebrated establishments in Europe. I have therefore ventured to adapt a



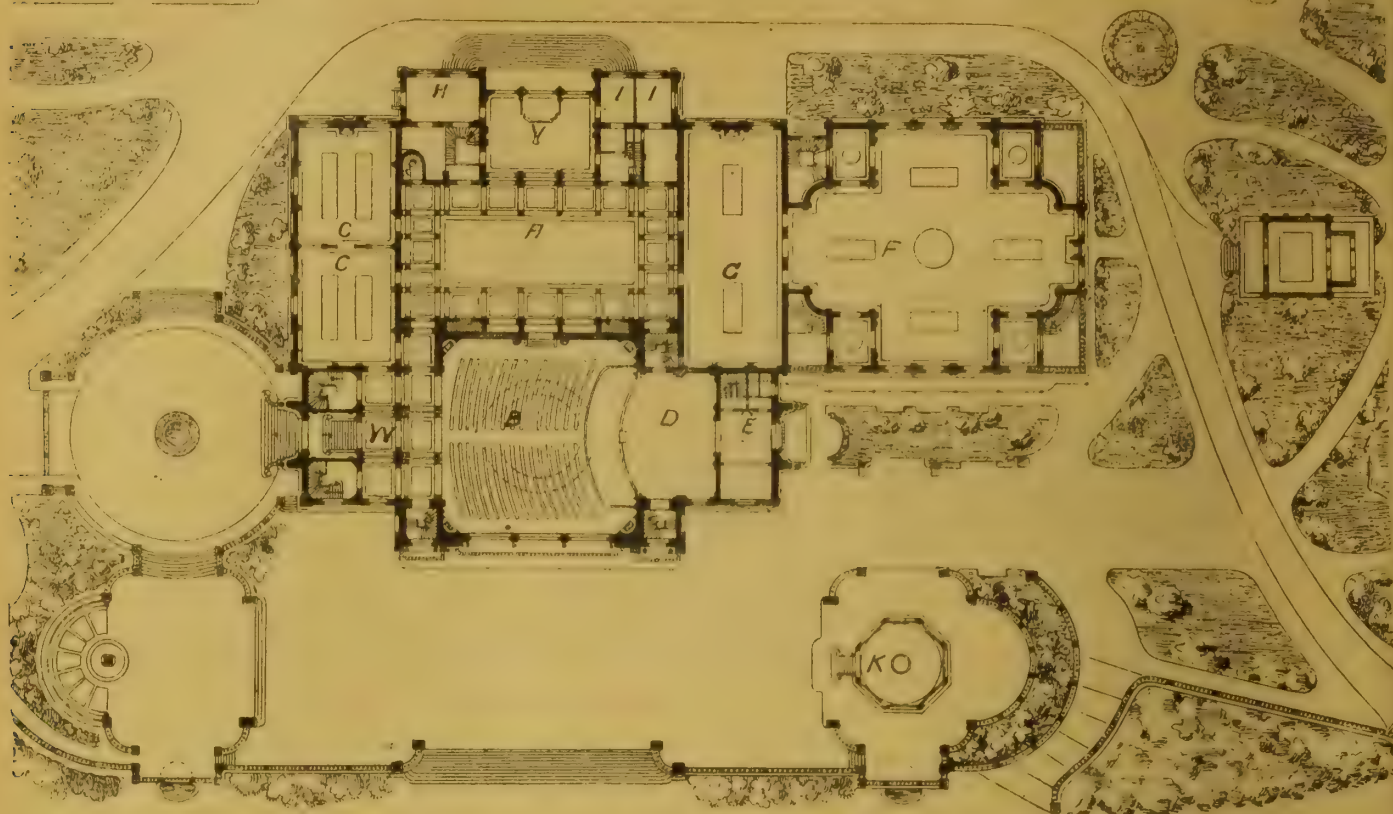


FIG. 1.—A, promenade hall; B, theatre; C, reading-rooms; D, stage; E, green-room; F, grand card-room; G, small card-room; H, cloak-room; I, offices; K, music pavilion; L, terrace; V, vestibule; W, theatre entrance.

plan and a few details of the building from the *Architektonische Rundschau* by way of illustration. The casino is, of course, chiefly noted for its gaming-tables, from which one million pounds per annum, or nearly so, have been realised during the past few years.

It is not my province to relate how the money is made and how the money is spent, nor how the establishment is run as a gambling company under the registered title of the "Société des Bains de Mer et Cercle des Etrangers de Monaco." As far back as 1853 a thirty years' concession was granted by the late Prince Charles to a company to enable them to carry on a gambling business. In 1860 the concession passed into the hands of François Blanc for its unexpired term. This man died in 1877; but during his tenure, I believe I am correct in stating that a new casino was commenced, consisting of a large card-room (F, Fig. 1) or "Salle Mauresque," which was completed before his death. In 1871 M. Charles Garnier, of Paris Opera House fame, added the magnificent theatre (B), the promenade hall (A), and vestibule (V), and since Blanc's death other rooms (C, C') have been added to the establishment.

It is related that M. Blanc died worth seven million pounds, and that the secret of his success was due to the spirit of "largesse" which he displayed in working all his enterprises. An example has been quoted how, when he heard that five million francs were required to complete the Paris Opera House, he pulled out his cheque-book and wrote an order for the amount.

But I am diverting from the consideration of this establishment from the architect's standpoint, so I would refer my readers who wish to learn the historical and financial particulars of the Casino to the December number of the *Pall Mall Magazine*, where Mr. John J. Waller fully describes all such matters of interest to the general reader.

Referring to the plan, Fig. 1, it will be seen that one of the chief entrances leads into a vestibule (V), with the bureaux (II) on one side and the cloak-room (H) on the other. From this vestibule is approached the central feature of the group of rooms or saloons—namely, the promenade hall, erected by Garnier. This hall is connected on its three sides with the various saloons of the establishment; in the wall, opposite the vestibule, are the entrances to the theatre; on the one side are the reading-rooms (C, C'), on the other the card-room (G), with the grand card-room or Moorish saloon (F) beyond.

The theatre (B), although connected with the promenade hall (A), has its separate grand entrance (W) and independent vestibule. This theatre is built of white freestone, with pink marble pillars and dark red marble enrichments to the windows; the decorations throughout are of rich character, mosaics entering largely into the design. The auditory is square in plan, measuring 20 metres each way, and 19·50 metres in height to the top of the ceiling, 11·80 metres to the cornice. The ceiling is richly decorated in frescoes, and the proscenium frame painted to harmonise with the lavishness displayed in the whole interior. The colour study is in red and gold, and the subjects

astonishing rapidity, considering the amount of work contained therein, the time occupied being but six months. The cost was three million francs.

A very good idea of the architectural treatment of the interior of the theatre can be gathered from the photograph looking towards the proscenium, which is reproduced in the article I have already referred to, and the character of the design of other parts of the building can be obtained from the detail sketches here produced. Fig. 2 is the enrichment of the box fronts of the private boxes, which occupy the two corners next the proscenium. Fig. 3 is a detail over one of the windows, while Fig. 4 is a door-head, Figs. 5



FIG. 2.—Box Front.

of the frescoes in the four panels of the ceiling are "The Dance," by Clairin; "The Play," by Lix; "The Music," by Boulanger; and "The Song," by Feyen-Perrin. Opposite the stage is the State box for the Prince of Monaco, while there are other open boxes formed on the balcony level.

The side-walls are divided into three equal panels; those on the inside wall are filled with large mirrors, which reflect the opposite openings, through which the sea can be seen. In the four angles of the auditory are niches, where candelabras are placed. There is a small stage (D), beyond which are the green-room (E) and the dressing-room. This theatre was built with

and 6 being other details from the same building.

The "Salle de Jeu," or Moorish room (Fig. 1, F), is arranged with a centre settee, and in each of the recesses is placed a gambling or roulette table, round which the chairs of the players are placed.

The maintenance of the theatre, orchestra, and other amusements connected with the Casino cost the company £30,000 a year. The leading artists of the operatic stage are engaged for the theatrical performances, and the orchestra has the reputation of being one of the finest in Europe. Londoners will soon have an opportunity of judging for them-



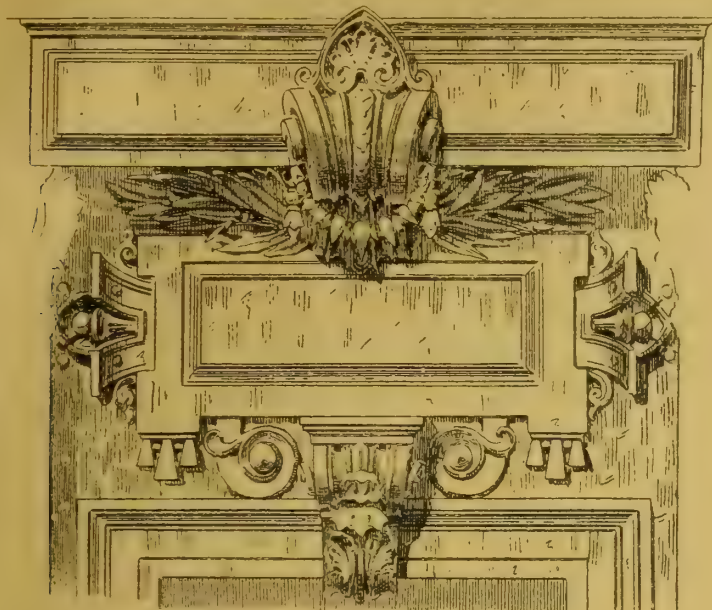


FIG. 3.—Detail of Window.

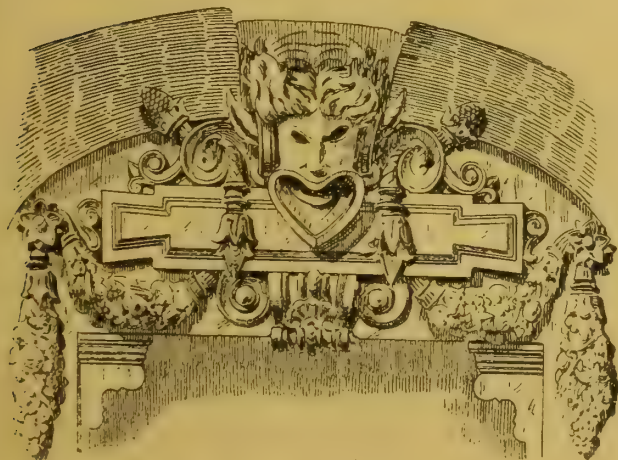


FIG. 4.—Detail of Door.

selves, as it will be heard at the Imperial Institute this coming season.

Fig. 6, the Public Hall at Neustadt, is an example of a building erected to meet the requirements of



FIG. 5.

visitors. Neustadt is a small town at the foot of mountains, and a favourite meeting-place for gatherings of artists. In order to accommodate the special meetings held in the place the town-

folk resolved to erect this large hall, and a committee invited a competition, in which twenty-five architects entered. A Frankfort architect,



FIG. 6.

Mr. Lieblein, was placed first, and Professor Geul second; but Professor Geul appears to have carried out the work, adopting some of Lieblein's ideas as to the arrangement of the ground floor.

The grand hall is 572 square metres area between the pillars, 965 square metres including the galleries. The hall is lit at the sides by a large number of windows, and seven windows occupy the circular end where the orchestra is placed.

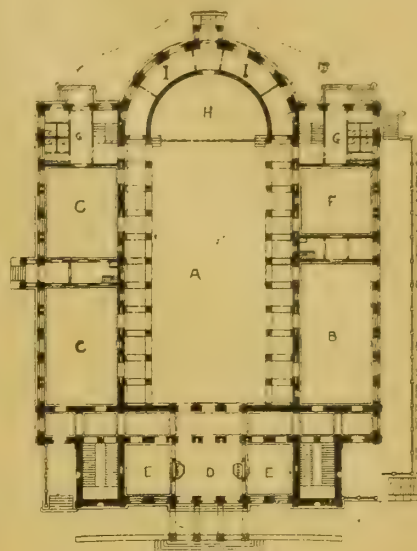


FIG. 7.—A, grand hall; B, smaller hall; C, restaurant; D, vestibule; E, cloak-room; F, dining-room; G, lavatory; H, orchestra; I, musician's retiring-rooms.

The window space is equal to one-fifth of the floor area between the pillars, or one-eighth the area of the whole hall from side-wall to side-wall. The hall is said to have bad acoustic properties, for, when not full, an echo is heard. This is accounted for partly by the position of the pillars, but chiefly through the bad proportions of the hall, which is too long for its width. The cost of the building was 300,000 marks. On the ground-floor level, of which a plan is given (Fig. 7), is

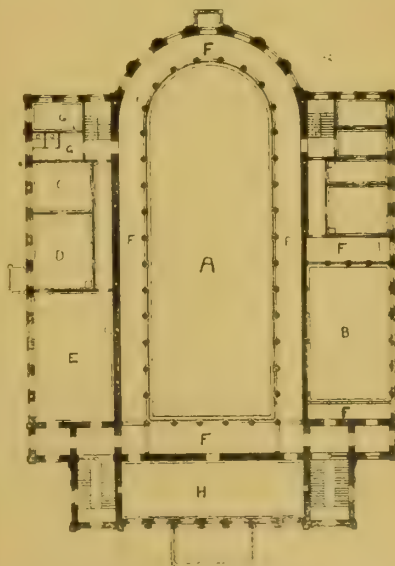


FIG. 8.—A, upper part of grand hall; B, upper part of smaller hall; C, library; D, reading-room; E, billiard-room; F, galleries; G, lavatories; H, loggia.

the main entrance, with vestibule and cloak-rooms on either side. A wide corridor divides the vestibule from the hall and its appurtenances. On either side of the hall are rooms for refreshments, supper-rooms, small hall, card-room, and retiring-rooms, and the musicians' rooms are in the circular end behind the orchestra. In the basement are the caretaker's living-rooms, and under the terrace is a skittle-alley. On the first floor (Fig. 8) is a gallery running round the whole of the hall, and from this gallery is approached the billiard-room, reading-room, and library. The smaller hall has a gallery at each end.



# DESIGNING OF STEEL BRIDGES. THEORETICAL AND PRACTICAL. —XXVII.

THE sectional area of the upper and lower flanges—for they are both equal and similar—of the open web truss we have selected for analysis and illustration was shown in our last article to be composed of three horizontal plates and a pair of vertical channel-irons. It will be necessary, in order to arrive at the stresses upon the diagonal bars of the web, to employ a stress diagram; but those upon the flanges, and also upon the terminal sloping compression bars, can be obtained readily by calculation. Those upon the flanges which are of practical importance are where the difference becomes sufficient to allow of one or more of the horizontal flange-plates being discontinued. When these points are ascertained to the nearest foot, the diagram of the elevation of the flange can be drawn, giving the length of the plates. The vertical channel, angle, or tee-irons, which are used to form differently-shaped trough flanges, are invariably continued the whole length of the flanges. It has been already stated that the net value of one of the horizontal plates is in square inches given by the calculation—

$$(24 - 3) \times \frac{1}{2} = 10.5.$$

The working stress of the steel was taken at 6.5 tons, so that before one of the plates can be dropped, there must be a decrease in the flange stress amounting to—

$$10.5 \times 6.5 = 68.25 \text{ tons.}$$

But the total stress at the centre of the flange where it is a maximum is 288 tons, so that the stress to be provided for, when only two of the horizontal plates are left, is, neglecting decimals—

$$(288 - 68) = 220 \text{ tons,}$$

and the problem is to find at what distance from the abutment the stress is equal to 220 tons. We may use the same equations previously employed, and putting  $W$  equal the total uniformly distributed load,  $A$  and  $B$  the segments into which the span of the girder must be divided,  $L$  the span itself, and  $S$  the given stress, we have—

$$S = \frac{W(A \times B)}{2 \times D \times L}$$

or since—

$$B = (L - A),$$

the value for  $S$  may be written—

$$S = \frac{W[A(L - A)]}{2 \times D \times L}$$

If we assume the length of one of the segments  $A$ , the other is known, so that the equation becomes reduced to—

$$A(L - A) = \frac{S \times 2 \times D \times L}{W}$$

$W$  is put equal to 230 tons, and the rest of the symbols are given; so that substituting their values the formula becomes—

$$A(L - A) = \frac{220 \times 2 \times 10 \times 100}{230}$$

Cancelling and dividing out, we find—

$$A(L - A) = 1,913.03.$$

Multiplying and changing the signs of both sides of the equation, we have—

$$A^2 - LA = -1,913.03.$$

Solving for  $A$  by the ordinary rule for a quadratic equation, we finally obtain—

$$A = 26\text{ft.},$$

from which the other segment equals 74ft. Therefore, at 24ft. from the centre of the span at each side the first or outermost horizontal plate may be dropped. In other words, the central plate will be 48ft. long. To find where the second plate may be dropped, it is only necessary to insert the proper value of  $S$ , which is obtained from the equation—

$$S = (288 - 136) = 152 \text{ tons.}$$

Employing the same formula as before, it will be found that the length of the second plate will be 68ft. The third plate, similarly to the vertical channel-irons forming the sides of the trough flange, will run the whole length of the main girders.

In Fig. 1 is shown a diagram of the three flange-plates, the lowest of which has a total length of 105ft., which allows a bearing of 2ft. 6in. upon the bed-plates. The method of arranging the joints in the plates, together with the proper number of rivets, has been already

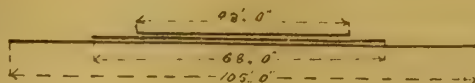


FIG. 1.



FIG. 2.

fully explained in previous articles, so we shall not now entrench upon our available space by needless recapitulation. It may be remarked that the rivets are to be of steel  $\frac{1}{4}$ in. in diameter. With a uniformly distributed load of 230 tons, the total reaction at each abutment will be 115 tons, which will bring a heavy stress upon the sloping struts at the end of the girder. If the angle of inclination of these members of the truss with the horizontal be  $\theta$ , the stress in tons will be, putting  $S_1$  for the stress, and  $R$  for the reaction—

$$S_1 = R \times \text{cosec. } \theta$$

from which we have—

$$S_1 = 115 \times 1.27 = 146 \text{ tons.}$$

Using the same working stress, a net sectional area for this part of the truss will be required of 22sq.in., which can be obtained by making the struts of the same area as that of the upper flange



FIG. 3.

FIG. 4.

—that is, by simply prolonging that flange right down to meet the lower one over the abutment. The two vertical channel-irons and one of the horizontal flange-plates will afford the sectional area necessary, and, moreover, form a very stiff terminal compression member. An elevation of the end of the girder thus formed is shown in Fig. 2, in which the necessary wrappers or cover-plates, both horizontal and vertical, are manifest. The rivets under the lower flange over the bearing  $B$  will be countersunk. Before ascertaining the net sectional area of the separate vertical compression bars in the web, the general section, or the form in which they are to be built up, may be decided upon. When the stresses upon each are subsequently determined, the size of the parts composing it can be readily arranged to afford the necessary quantity of material. The general manner in which the vertical struts in the web

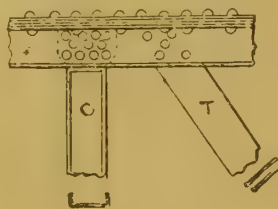


FIG. 5.

of the truss is built up is seen from the elevation of part of one in Fig. 3. It is composed of a pair of channel-irons, varying in size according to the local position of the struts, and placed *dos à dos*, and connected together by lattice-bar bracing inclined at an angle of 60 degrees. As channel-iron is a very handsome section for bridge and roof building when the projecting ribs are turned outwards, they should always be placed *en façade* if possible. It might appear from the inspection of Fig. 3 and Fig. 5 that, in order to accomplish this, the ribs of the channel-irons have been cut off where they pass in between the vertical channel-irons of the flanges. This, however, is not the case, and in order to prevent it the following clause should be

inserted in the "Specification":—"The projecting ribs of the channel-irons, whether this section is used in the flanges, in the vertical compression bars of the web, or in any part of the truss, are on no account to be cut off. Where it becomes necessary, as in Figs. 3, 5, and 6, to

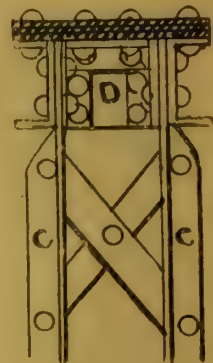


FIG. 6.

insert the struts in between the vertical channel-irons or sides of the upper and lower flanges, the ends of the channel-irons are to be heated, and the projecting ribs forged down or welded on to the table or channel part, so as not only to increase its thickness, but to also increase the rivet area available for forming the connection between the flanges and the web. In other words, the quantity of metal in the channel-iron is to be retained constant, although the actual section or shape is altered." The same proviso, it may be remarked, holds good for angle, tee, and other sections of iron, when placed in circumstances similar to those under consideration. A longitudinal section of the vertical strut in Fig. 3 is shown in Fig. 4. On one side of the centre line  $AB$ , the

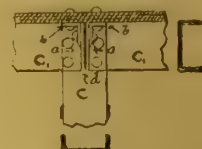


FIG. 7.

rib of the channel-iron is supposed to be drawn in elevation, although it does not properly belong to the sectional view.

The general elevation of the junction of the bars in the web, both vertical and diagonal, with either of the upper or lower flange will be apparent from an inspection of Fig. 5, in which the dotted lines indicate the manner in which the welding or widening out of the channel-irons of the vertical struts is accomplished. Adjoining the compression bar  $C$  is the diagonal  $T$ , which is in tension. The maximum number of these bars in one plane will be four, and their respective thicknesses, as well as their widths, will vary with their position. They will be all of plain bar steel, since counterbraces will be introduced to prevent their being subjected to stresses of an opposite character, which would exceed in intensity those properly belonging to them—namely, those of tension only. In designing those parts of a truss shown in Fig. 5, too much attention cannot be given to the details of the attachment of the different members, especially of the struts. Each of the vertical struts is double—that is, built up of a couple of braced channel-irons, as in Fig. 3. In addition to being riveted to the vertical sides of the flanges, each channel-iron should be connected to the other where they pass inside the flange (see Fig. 5), and also at the same point with the horizontal part of the flange as well. The detail drawing, Fig. 6, shows how this firm and solid



connection is put together, and the several parts of which it consists. In the figure, the three flange-plates are represented by the hatched lines, and the diaphragm plate D, which has a thickness of  $\frac{1}{2}$  in., is riveted to channel-irons of the flanges by angle-irons, 3 in. by  $\frac{1}{2}$  in., in a similar manner as those shown in Fig. 3 in our last article. But in this instance, besides the connection with the sides of the trough flanges, the diaphragm plate is also fastened to the horizontal plates by an angle-iron, through which passes some of the regular riveting of the three plates. The attachment of the bars in tension to the flanges will be effected in a different manner, of which details will be given in our next article. In Fig. 7 is shown a cross-section taken at right angles to that in Fig. 6. The vertical strut in the former figure is marked  $c_1$ , and  $c_2$  are the channel-irons of the flange.  $a a$  are the two vertical angle-irons fastening the strut and the sides of the flange to the diaphragm plate  $d$ . The angle-irons  $b b$  connect the diaphragm-plate with the horizontal parts of the flanges.

Before proceeding further with the other details of the truss, it will be necessary to ascertain the stress upon both the vertical and diagonal members of the web. There are several methods already described which will all yield the same results. Of these we shall select the reciprocal diagram of forces as the most suitable under the conditions of loading assumed for the truss. The method of employing this elegant graphic analysis of the stresses upon the different members of a girder or truss has been fully investigated and explained in former articles, so that the diagram and its results alone will be given, which results will be tabulated for all the various parts of both flanges and web.

#### THE SURVEYORS' INSTITUTION.

At the ordinary general meeting of this society, held on Monday last, the discussion was resumed of the paper read at the last meeting by Mr. A. A. Hudson, on "The Conditions of Building Contracts." The chairman, Mr. D. Watney, in opening the proceedings, alluded in feeling terms to the loss which the Institution had sustained by the death, on the 1st inst., of one who might well be called its father—the late Mr. John Clutton. To the older members he was a valued personal friend, and to the younger members he had always been ready to give valuable advice and professional assistance whenever it was in his power. Mr. T. M. Rickman joined the President in expressing a sense of the loss which they had all sustained by the death of Mr. Clutton, who, so long as he was able to take part in the affairs of the Institution, had directed them with a masterly and friendly hand.

Mr. Rickman resumed the discussion of the paper by saying he was glad to have the opportunity of mentioning what, after some years' study of the question, he believed to be the points which most needed solution, and on which the builder and architect were most at variance. As to whether the architect was properly the arbitrator under a contract, there existed some difference of opinion. His position as agent of the employer was a difficult one. It was said that the employer should know exactly what he agreed to; but it was only fair that the builder should also know; and if the architect were thus the agent for giving information to the builder, everything coming from him—drawings, specifications, or quantities—before the contract was signed, must be regarded as from the employer. That, he thought, made the quantities part of the contract. Materials were often described as "best" or "second best"; but there were now "best best" and "beat best best" materials, and the term had lost its significance, having been lowered by superposition. It was of great importance that the architect and the builder should act up to the clauses expressing the power of the architect to order extras. He thought, also, that it should be in the power of the employer—if at any time he had reason to wish to do so—to terminate the contract—of course, on paying reasonable compensation. If the desire for fairness and impartiality were as widespread as Mr. Hudson seemed to think, conditions of contract might be very much simplified. As to the question whether the quantity surveyor should value for advances, it seemed clear that if he did so, he must be adequately paid for the work. He did not agree that the quantity surveyor's charges on going into accounts of extras and omissions should be paid half by the employer and half by the builder,

for extras simply resulted from the employer's change of mind, and not from the builder's action. It was not desirable for a surveyor in a case to hold the position of arbitrator; nor was the architect a suitable person. He thought that if arbitration were necessary, some new mind should be brought in, who could impartially consider the interests of both employer and builder. Some reference had been made to the set of conditions published by the R.I.B.A. Thirty or forty years ago a set of conditions was arranged between the Institute of Architects and the Builders' Society (now merged in the Institute of Builders). The conditions agreed to then were found satisfactory. They were to a large extent the same as those published by the Architects in 1882, but differed as to the arbitration clause. Within the last four or five years long discussions had gone on between the R.I.B.A. and the Builders' Institute with a view to bringing forward a new set of conditions, and a set was arrived at which was, he believed, generally acceptable. The principal difference was on the point of when the working drawings were to be furnished, and when had the builder a right to demand them. The present position was that the original conditions as published by the Architects had been withdrawn; the conditions of the Builders had added to them the clause making the quantities part of the contract; while the new conditions contained an arbitration clause to which the Builders had not as a body assented. The question of furnishing working details was a difficult one. Work was now done at so much greater a pace than formerly that architects found it almost impossible to furnish in advance details of all work on a large contract. With regard to the subject of other tradesmen's estimates, his views was that when special contractors were introduced the time bargain with the main contractor was at an end. Extension of time for delay caused by weather, &c., was, he thought, very seldom allowed from time to time as the work proceeded. When the architect went into the question of penalties he generally then considered such extensions.

Mr. Josiah Hunt said that the worst disputes he had known had arisen between people who, with every friendly intention, had entered upon a contract, neglecting business-like methods and trusting to their good intentions. A frequent cause of contradictions in the conditions was the fact that, although they were drafted by a person who had them in his mind as a whole, they were revised by another in parts only. As to materials and work being "to the satisfaction of the architect," he would advise a builder to work only under an architect whom he knew to be fair, and who would place a reasonable construction on this condition. As to payments on account, it was perhaps natural that builders and architects should look upon them from different points of view. The builder considered his outlay to date, whether for special plant, carriage, or materials brought on to the works, while the architect regarded only the value of the work actually executed, and which had passed to the owner. Unless a special provision were made for allowance for materials brought on the works, he thought the architect's view was the right one. He did not agree that the quantity surveyor or any third party, as between the architect and the builder, was a suitable umpire, nor that the builder should pay half the surveyor's costs for settling deviations. The final certificate was more important than the intermediate certificates, for it settled the sum deemed by the architect to be payable, and a dissatisfied builder's only remedy was by arbitration. It was quite true that the contractor generally supposed that the architect warranted that the plans could be carried out; but the real fact was that the contractor warranted that he would carry them out, and, if they proved to be impracticable or unworkable, it was the contractor who was liable, and not the architect or employer. Such seemed to be the law. A previous speaker had reminded the builder that in these contracts it was a case of *caveat emptor*; but he thought that it was the employer, and not the builder, who was the *emptor*.

Mr. P. E. Pilditch agreed that many of the present difficulties arose from the haste in which buildings were designed, contracted for, and completed. As to the description of "best" work and materials, he thought that this description must be read as having regard to the character of the building. That was an element running through all building contracts, and if the architect and the builder knew their business,

there was no difficulty in agreeing what materials and work were best suited for the particular building in question. In small contracts the architect was probably known to the builder, who could place reliance on his fairness, but in large public contracts this was impossible, and in such cases the precautions suggested by the R.I.B.A. conditions seemed very advisable. He would suggest, however, that the qualification for an arbitrator in such matters should be that he be an architect and F.S.I. as well.

Mr. W. Eve said he noticed frequently repeated in Mr. Hudson's paper the word "dispute." He remembered a case in which the contractor, after commencing the work, abandoned it. It was desired to call in an arbitrator, but there having been no "dispute," this could not be done. He managed to arrange it, but it raised a curious question. He had himself adopted a very simple form of contract, which bound the contractor to perform the works, according to the drawings, specification, and quantities, and avoided the contract and the conditions clashing with each other.

The discussion was adjourned to the meeting of April 13th.

#### THE M'EWAN HALL OF THE EDINBURGH UNIVERSITY.

THE scheme for the construction of New University buildings for Edinburgh, begun in 1874, has been advanced another important step by the erection of the M'Ewan Hall, now nearing completion, and visited on Saturday afternoon by the members of the Edinburgh Architectural Association, under the guidance of the architect, Dr. R. Rowand Anderson. The hall has been erected at the sole cost of Mr. W. M'Ewan, M.P., amounting to between £60,000 and £70,000. The hall, which will be seated for 3,000 persons, occupies the site of what was formerly Park-street, the whole of the houses in which were cleared away to make room for it. The hall, semicircular in shape, is based on the form of the ancient Greek theatre. The flat side of the half-circle is to the west, and in the centre of it is a flattened apse, in which are placed the platform and organ-loft. At the back of this platform is a series of oak stalls for the professors, and overhead the organ-loft is inclosed by an open oak balustrade. The hall has two walls—an outer and an inner. The space between them on the ground floor forms a corridor 12ft. wide, and in the upper stages are placed two galleries, the circular inner wall being opened up to the interior of the hall by an arcading of 13 bays, each 15ft. in width, and rising from the floor to the top of the arch to a height of 48ft. Square moulded grey stone bases are carried up to the height of the balustrade of the first gallery; on these rise red columns with gilded Corinthian capitals, from which the arches spring. At the wall-head is a carved stone frieze and cornice; above is a coved clerestory with circular windows, 7ft. in diameter, and the hall is covered in with a dome constructed of steel and panelled with wood. In the centre of the dome is a circular light, 22ft. in diameter, which, with the clerestory windows, lights the hall during the daytime. From the floor to the dome light the height is 90ft. To the wall-head it is 58ft. The steel roof has been specially designed by Messrs. Cunningham, Blyth, and Westland, civil engineers, Edinburgh. The internal diameter of the outer wall circle is 134ft., and of the inner circle 106ft. Measured from the outer circle to the back of the wall of the platform, the distance is 107ft. The platform opening is 52ft. in width, and is covered in with an elliptical ceiling. In the south angle is placed the principal staircase, while on the north side is the base of the proposed campanile tower, which forms part of the original design. In the outer circumference are constructed two circular staircases, each containing a double stair—one leading to the first gallery and the other to the second. The outer walls are heavily buttressed, and only on the ground floor are they pierced with windows for the lighting of the corridor, which is brick-lined and vaulted with stone—the vaulting springing from broad moulded stone pilasters carried at intervals up the side of the walls. From the inner circle there are five doors giving admission to the hall. The internal walls to the height of the first gallery are panelled in dark-stained oak, and both galleries have open balustrades of the same material. The pews in the galleries are of oak, placed on a sloping platform, and a pitch is also given to the fixed *fauteuils* ranged in four tiers

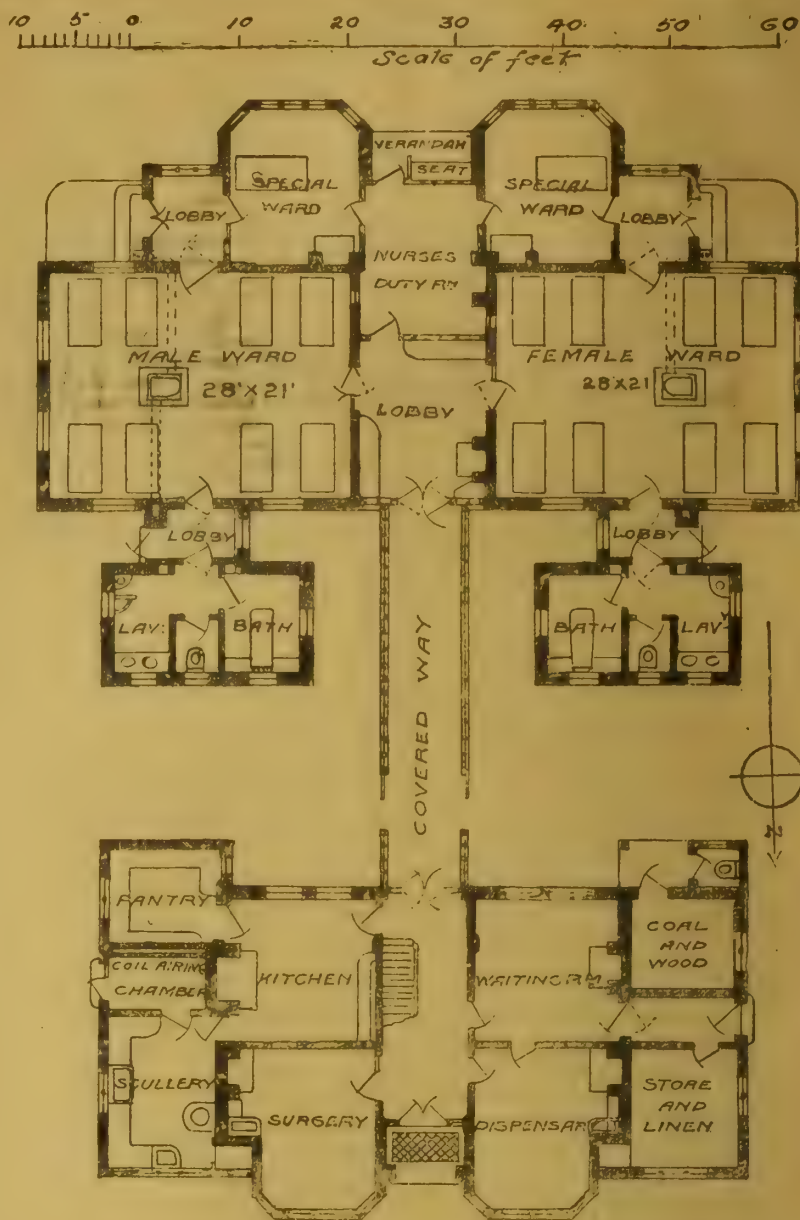


round the back of the semicircle on the area level. The area floor is of oak, and on it the seats will be of a movable kind. In the external elevations the wall is divided vertically by buttresses, corresponding to the internal divisions of the hall, and providing a series of deeply-recessed bays. On the face of the buttresses are niches for statuary. Horizontally there are three divisions. The lower one is panelled, and shows the windows for lighting the corridor. The upper section is arcaded in red stone, and the wall is surmounted by a cornice and open balustrade. Over these rise the clerestory and the dome, the latter of which is covered with lead and finished off with an ornamental lantern 30ft. high. The total height from the street level to the top of the lantern is 130ft. The principal doorway, in the east elevation, is 30ft. in height, with a square-headed opening surmounted by a circular-headed pediment. It is 16ft. in width, and is flanked at each side by double pilasters. The hall is to be lighted artificially by means of the electric light, and the organ will be worked by electricity. The decoration of the hall has been carried out by Mr. W. M. Palin, of London, who has been engaged for over two years on the undertaking. Mr. Palin has adopted relief painting, treating his figures according to naturalistic pictorial principles of representation; he has given them strong relief and his backgrounds perspective depth. The dome is divided architecturally into fifteen compartments formed by the ribs, which are picked out in gold twisted ornament. Each compartment is subdivided into four panels of different sizes, separated from each other by a blue-black band. The three upper panels in each compartment are filled with ornament in white and gold. In the lowest and largest panel is a seated female figure double life-size, posed against a background of gold mosaic. This gives fifteen figures seated in the half-circle of the dome, representing the Arts and Sciences. The figures wear draperies of various colours, and hold some appropriate instrument or implement. The lines of the circular light of the dome are indicated in gold; while round the inner edge of the dome itself is a wide blue band, having in gold letters a text from Holy Writ. On the west wall, over the top of the platform opening, and at its sides, is a painted panel, which measure 100ft. across, and narrows as it ascends to the apex. The subject is the "Temple of Fame," and in it are nearly ninety figures on a scale of 9ft., representing philosophers and students standing in groups or ascending steps to a piazza, where is arranged a background of colonnade and temple. The apex of the composition is formed by three goddesses representing Science, Art, and Literature. The clerestory is in sky-blue and gold, and the carved stone frieze is picked out in gold. In the spaces between the arches of the arcade are medallions, on which have been painted heads. On the west wall on each side of the platform opening are two large panels, each 24ft. by 13ft., with lunettes above them. That on the right represents Minerva seated on a marble throne in a grove of Academia, receiving the gift of the building. On each side of the steps of the throne are groups of figures in classic robes, into one of which the artist has introduced a portrait of Mr. McEwan. The other panel represents "Fame." Groups of men are ranged up on each side, and a kneeling aspirant is being presented. The paintings and dome decorations were executed in oil on canvas in the artist's studio by himself and his assistants, and afterwards affixed to the dome and wall. The only portion of the original design of the group of University buildings still remaining unexecuted is the tower, which on the plan takes the form of the lofty campanile, 270ft. in height, with a square base 32ft. across. The lower stage of it, of course, has been built, and forms the north angle of the McEwan Hall. Another "pious donor" is still wanted to complete the scheme.

#### "COTTAGE HOSPITALS."

NO higher authority can be quoted on the subject of the management and planning of general, fever, and convalescent hospitals than Mr. Henry C. Burdett, the experienced and accomplished author of the "Hospitals and Asylums of the World," a work of monumental proportions and chief textbook on the history of

Cottage Hospitals: General, Fever, and Convalescent. By Henry C. Burdett. London: The Scientific Press, Limited, 423, Strand. 1896.

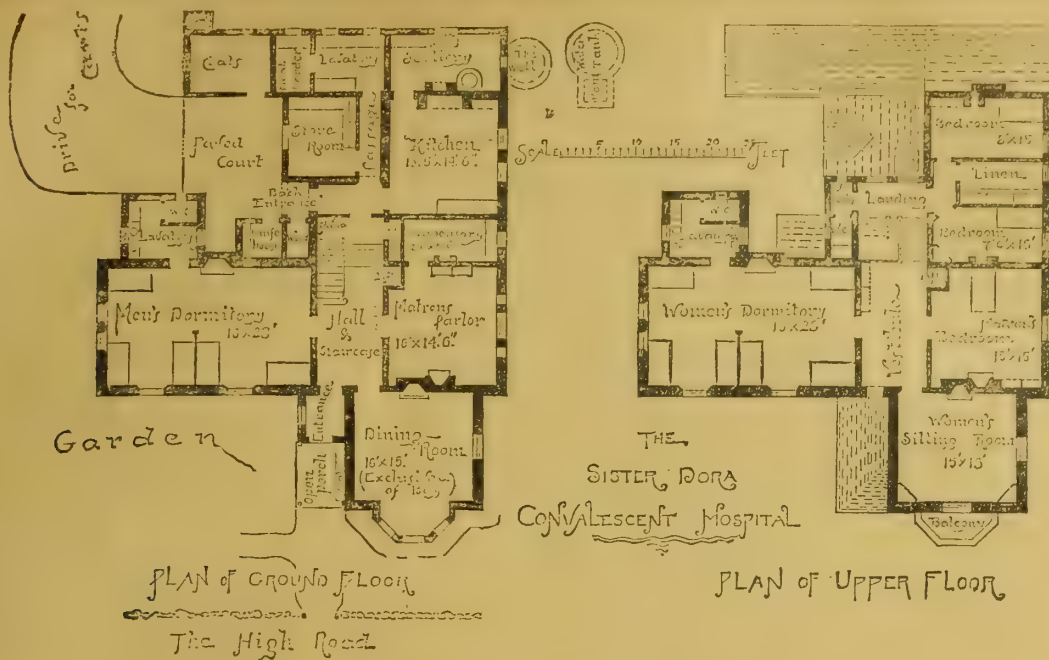


the questions with which it is concerned. The Scientific Press, Limited, have just issued a new and third edition of "Cottage Hospitals," by the same author, fifteen years having elapsed since the second edition of the book first appeared. During this period developments of various kinds have of course been made, and the opinions of experts have changed, while experience has brought about many improvements in the designing of buildings of this class. The author has consequently realised the necessity of practically rewriting his treatise, adding many more plans with which to elucidate his remarks which tend to prove the economic advantage of the straight as opposed to the pavilion system, the latter principle having been found too costly a method for so small an institution as the cottage hospital. After all, the question of cost necessarily occupies a prominent place in discussing and inaugurating projects of this kind, and a foremost consideration with managers must always be the expense of maintenance and administration. The average annual expenditure in 1892 of 183 cottage hospitals having an average number of from 12 to 15 beds, and in 106 of which the average number of beds occupied was 11, was £622. This gives the cost per bed as £41 on the whole number, or £66 per bed occupied. The average cost per bed at a hospital like the London Hospital was in the same year £79, or £97 per bed actually occupied; while at the Middlesex Hospital the cost was respectively £90 and £112, so that it will be seen on the score of economy how much can be urged in favour of the cottage hospital. Mr. Burdett further exemplifies this important consideration by a table from typical metropolitan and provincial hospitals, and, after taking into consideration the difficulties

which surround cottage institutions, such as the necessity of buying in small quantities and the consequent loss of trade discount, the cost of carriage, drainage difficulties, and water supply, it is a great feather in the cap of cottage hospital managers to find that the expenditure per bed has not materially increased. Fifteen years ago the cost was £66 7s. per bed, and the present figures show it now to be only £66 10s. These figures speak for themselves, and we can hardly give space to the pleasurable task of following Mr. Burdett through his other evidence concerning the question of finance, dealing as he does with sources of income from donations, legacies, payments, and subscriptions.

The systems of nursing and medical administration, too, are somewhat beyond our province, though all the points dwelt upon in the volume before us appear to be of the utmost consequence to the managers of such institutions. No one engaged in the designing of cottage hospitals can afford to ignore the difficulties alluded to, and the author's helpful suggestions will be most appreciated by those who have found how real some of these minor difficulties actually are. No universal rules can be laid down, of course, for general adoption, as the circumstances surrounding almost every project vary in a remarkable degree. In mining districts three to four beds per 1,000 does not seem too high, and in agricultural districts one bed per 1,000 is considered sufficient. The questions of site, proportion of wards with regard to the sexes, ventilation, warming, and sewerage, are all particularised in due order, giving information from the medical man's point of view in such a way as to be suggestive to the architect, even if the knowledge of the architect on building matters may be in some ways more complete.





Under the head of a more detailed account of certain individual hospitals, several typical examples are given, commencing with Cranleigh Cottage Hospital, the first institution of its kind, and built in 1859. Bourton-on-the-Water followed in 1861, and then among others Petersfield, Harrogate and Lynton, Ditchingham, Leek Memorial and the Walker Hospital, West Cornwall Miners' Hospital, Redruth, and Petworth Cottage Hospital, all of which, of course, are open to improvement when examined in the light of subsequent experience. First and foremost, quite a head and shoulders in advance of its fellows, in the opinion of Mr. Burdett, stands out the Grantham Hospital, built 20 years ago, when it was considered a model of hygienic perfection, and since then many improvements have been carried out. The site, on the slope of a hill, has much to do with the bright and cheerful appearance for which this building is remarkable. A good and compact plan is illustrated by the Maidenhead Cottage Hospital, reflecting credit on the architect, whose name, however, is not given. It cost £1,925 for the structure and £250 for the furniture. The Ashford Cottage Hospital is rather a larger institution of excellent plan. The Sister Dora Convalescent Hospital, Milford, Stafford, which we have chosen for illustration, cost £2,000 for the fabric, £250 for the furnishing, and its annual cost of maintenance is about £500. It was erected in memory of Sister Dora, of Walsall, through the exertions of Miss Margaret Lonsdale, and stands on a fine site at the corner of Cannock Chase. The exterior is of an unassuming character, and it is two stories in height. Designed with every attention to rigid economy, it has been certainly well planned as regards both efficiency and cheapness of administration. It is wanting in a bathroom, however. The Livingstone Cottage Hospital, Dartford, we have selected as an unusual model. It consists of two distinct buildings, one being the administrative block, and the other containing the wards and their offices, the two parts being connected by a covered way. There is much to be said in favour of this arrangement, and it permits of a freer circulation of air, and keeps the wards separated from the administration rooms. The disposition of the ward windows is unfortunate, as the side where there is least window space happens in each case to be that facing south, and in a small hospital like this the author thinks the special wards were somewhat unnecessary. Mr. G. H. Tait was the architect, and Mr. Stanley, the African explorer, opened the building in 1894. Wood Green Cottage Hospital cost £1,800, and was erected, at the cost of Mr. J. Passmore Edwards, by Mr. C. Bell. The Surbiton Cottage Hospital is very much on what may be called the villa type, due, possibly, to the restricted site. Several other good specimen plans are furnished, affording numerous types and details of considerable use to the student in acquiring knowledge on the subject. The volume is in a handy form, well bound and

printed, at once filling a want and furnishing the class of information most difficult in the ordinary way to obtain. No better recommendation could be given to the treatise.

#### SEWERAGE AND SEWAGE DISPOSAL.

PROFESSOR HENRY ROBINSON, Memb. Inst. C.E., has summarised in this volume a great deal of valuable information, memoranda, and data derived from the researches of chemists, biologists, and engineers in relation to sewerage and sewage disposal. The bacteriologist has furnished the engineer with facts which must now form part of the knowledge of engineers engaged in works of water supply and sewerage. The first chapter deals with house drainage, and here the author merely recapitulates well-understood principles on the subject, to which it is needless to call attention. Dry areas and hollow walls and dampcourses to cut off the damp soil, and open-jointed drains unconnected with the sewer, concrete over basement, are now accepted as the only preventive measures against dampness. The requirements of drainage, trapping, and ventilation are stated in a concise manner, and the author endorses the opinion held by all sanitarians, that before a house is let, a certificate from the local authority should be required. Data for the calculation of sewage and rainfall are given in the chapter on sewerage, and it is stated that including rainfall from roofs, yards, &c., the sewage may be taken at about 66 ft. per head per day; one half of which would be discharged in six hours. The Lower Thames Valley Main Drainage Board was constituted, it is said, "on the basis of the several districts contributing 250 gallons per day per house, which at six people to the house gives 40.2 gallons per head." It is also stated that, the new sewers for Edinburgh were calculated to provide for a discharging capacity of 42 gallons per head per diem (allowing for 2 in. of rainfall), one half passing off in eight hours, and this capacity has not been overtaxed. The author refers to the jointing and laying of stoneware pipes, and the Stanford, Doulton, Sykes, and Archer joints. He gives several useful rules and formulae for the construction of egg-shaped and other sewers, and says that very good sewers have been made of concrete consisting of six parts of gravel and sand and one part of Portland cement. The invert is first built, and then the concrete is rammed behind a smooth mould of sheet-zinc, the top turned on centres, and the interior rendered with cement. Several useful formulae for flow in sewers are given worked out by numerical examples, and these are taken from Professor Robinson's work on "Hydraulic Power." The results and experiments summarised under "River Pollution" are valuable. The value of storage, for example, in freeing river

Sewerage and Sewage Disposal, By Professor Henry Robinson, M.Inst. C.E. London: E. and F. N. Spon, Strand.

water from pathogenic germs, is shown by experiments by Dr. Percy Frankland. This is due to the effect of sedimentation of river water when stored in reservoirs. Experiments in Thames water in its natural state showed that the typhoid bacilli introduced into it remained alive for nine days; those conducted in Loch Katrine water in its natural unsterile state showed that they remained alive 19 days; and in deep well water 33 days. When these respective waters were sterilised by heat the bacilli remained alive for 32 days, 51 days, and 32 days respectively. It is at least established that disease germs are destroyed by other bacteria, who produce conditions unfavourable to them, or devour them, though the latter theory is now doubted. In running streams and storage reservoirs the conditions are unfavourable to the existence of the disease bacilli, and the Thames water have chemical products which are prejudicial to the typhoid germs. The chapters on precipitation deserve study. The author reviews the principal processes, and points out their main features. His views regarding the disposal of the sewage of London have been borne out. The disposal of the sewage on land would have required an immense area, and the cost of pumping to control it would have far exceeded the value of the crops. The inexpensive chemicals which are now used as deodorants and precipitants, lime and protosulphate of iron (the latter was introduced by the author and Mr. Melliss, at Coventry), have at least abated the nuisance, and have saved the Thames from pollution. The volume will be found a complete textbook on the subject.

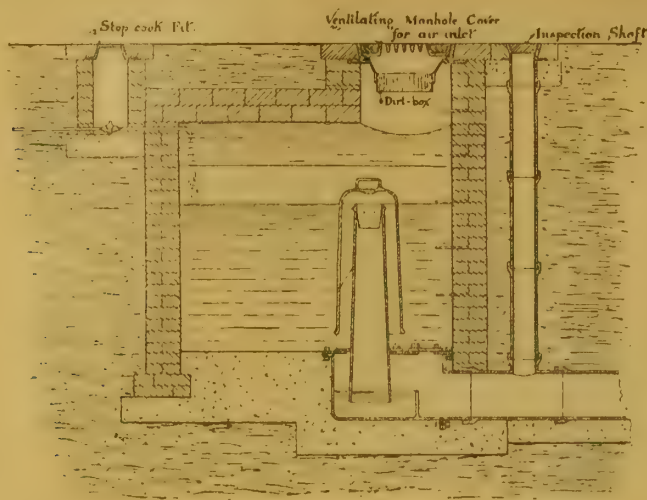
#### NOTES ON DOMESTIC DRAINAGE.—V.

##### THE FLUSHING AND CLEANING OF DRAINS.

ALTHOUGH provision for flushing public sewers has for a long time received careful consideration, it is comparatively of recent date that the sanitary importance of thoroughly cleansing the house-drains by means of a periodical flush has generally received sufficient attention. By means of the rapid and powerful discharge of a large volume of water, all deposits may be forcibly carried away, and at the same time the thorough renewal of the air within the drains greatly assisted.

A flushing tank or chamber should be provided at the head of every main or collecting foul drain, and it is desirable that this principle be carried out even though the drains are laid with ordinary self-cleansing falls. Arrangements should be made for a flushing tank to discharge over all gullies receiving greasy water, as from scullery sinks, &c., for the complete cleansing of the gully and branch drain connected thereto. In most cases it can generally be arranged that the branch drain from the scullery sink is also the head of one of the collecting foul drains, so that the flushing of this gully will suffice for flushing the collecting drain with which it is connected. (See Fig. 10.) Special flushing arrangements





SECTION THROUGH AUTOMATIC FLUSHING CHAMBER.

FIG. 10.

need not be made to unimportant branches, provided they are laid with self-cleansing falls, and are of no great length. As a general rule, flushing tanks or chambers should be automatic in action.

The quantity of water required to properly flush a given drain will depend on its gradient and also on its length. The following table shows the amount considered necessary for the satisfactory flushing and cleansing of drains at different gradients up to a maximum length of 500ft. It is seldom that any ordinary house-drain will exceed that length.

TABLE OF VOLUME OF WATER REQUIRED FOR FLUSHING DRAINS UP TO 500FT. IN LENGTH, WHEN LAID AT VARIOUS GRADIENTS.

Diameter of Drain.	Gradient of Drain.	Capacity of flushing tank or chamber.	Diameter of discharging outlet from flushing tank or chamber.
4 inches	1 in 40	30 gallons	3 inches
4 "	1 in 50	40 "	3 "
6 "	1 in 60	60 "	4 "
6 "	1 in 100	100 "	4 1/2 "
6 "	1 in 200	160 "	4 1/2 "
9 "	1 in 100	200 "	6 "
9 "	1 in 150	250 "	6 "
9 "	1 in 200	300 "	6 "
9 "	1 in 300	400 "	6 "

The method of flushing a gulley receiving grey water from a scullery sink will be further discussed when considering the form of gulley required to receive scullery wastes. In places where an iron flushing tank cannot be conveniently fixed at the head of a drain, it becomes necessary to construct an underground flushing chamber. A section through an automatic flushing chamber fitted with Mr. Rogers Field's patent cast-iron annular siphon and wrought-iron trapping-box is shown in Fig. 10.

When flushing tanks or cisterns are provided with covers, whether underground or not—care must be taken to allow the unrestricted entrance of air to the tank, or siphonic action cannot take place. For small flushing tanks at the head of branch drains, it is generally sufficient to arrange for their discharge once a day. In the case of underground flushing cisterns at the head of main drains laid with self-cleansing falls, one discharge every five or six days may suffice.

## FORM AND MATERIALS OF DRAIN-PIPES.

For general purposes, drain-pipes of a circular section have been found to give the best practical results, and are usually made either of cast iron or salt-glazed stoneware. Stoneware drain-pipes should be salt-glazed, highly vitrified, impervious, perfectly smooth inside, true in section, straight in the barrel, with well-formed sockets, and an even thickness of material throughout. The pipes when struck should give a clear ringing sound, and when fractured present an almost metallic appearance. They should be entirely free from sandholes, fire-cracks, or other defects.

Earthenware pipes should not be used, as they are very porous, and are not burnt at a sufficiently high temperature to become vitrified. The degree

of impermeability of a pipe may be ascertained by placing it in a vertical position, and temporarily blocking the lower end, and filling the pipe with water. If the material is porous, and the pipe insufficiently glazed, the water will penetrate the pores of the material, and show itself on the outer surface of the pipe in the form of "sweat" or perspiration.

Where stoneware pipes are intended to be used for foul drains, they should be specially selected, and capable of withstanding a test of 25ft. head of water without showing signs of sweating. Most well-known makers manufacture a special class of pipe in which every length has been thoroughly examined and tested to a considerable head of water. Each pipe is distinctively stamped by the maker before being sent from the works. Stoneware pipes can now be obtained in 3ft. lengths. This is a great advantage and improvement, owing to the number of joints required being thus considerably reduced.

The following table shows the average thickness and weight of stoneware drain-pipes:—

AVERAGE THICKNESS AND WEIGHT OF STONWARE DRAIN-PIPES.

Bore of pipe.	Net length of pipe when laid.	Length of socket.	Thickness of stoneware.	Average weight per pipe.
Inches.	Feet.	Inches.	Inch.	lb.
4	2	1 1/2	3/8	18
6	2	1 1/2	3/4	34
9	2	2	1	60

Cast-iron drain-pipes should be in 9ft. lengths of good tough grey iron from the second melting, smooth inside, true in section, perfectly straight in the barrel, with an even thickness of metal throughout, free from air-holes, sand-holes, and other defects. The sockets should be strong, with a good margin all round for caulking up, and the spigots provided with a bead cast on the end. They should be capable of withstanding 200ft. head of water, and coated with some preparation to prevent oxidation. The usual preservative processes employed are the "Dr. Angus Smith" and the "Bower-Barff."

To carry out the Dr. Angus Smith process, the pipes are carefully cleaned and scraped free from sand, scale, and rust. They are then dipped vertically into a mixture of pitch, coal-tar, and a small proportion of linseed oil. Whilst the pipes are being dipped the coating-bath is maintained at a temperature of about 400° Fahr. After being allowed to remain in the bath about 10 minutes, the pipes are withdrawn gradually, so as to allow the surplus mixture to run off.

When the process is properly carried out, the coating on the pipes should be tough and firmly adhering to the iron surfaces without any tendency to chip or scale off, having a uniform thickness throughout of 1/16 in. The pipes should be coated before leaving the foundry, so that the surfaces may not become oxidised or rusted before the coating is applied.

Where the Bower-Barff process is adopted, the pipes are thoroughly cleaned, placed in a chamber heated to 1,200° Fahr. for eight or ten hours, and

exposed to the action of superheated steam. By this means the surfaces of the pipes are completely covered with a hard coating of black oxide of iron, which in itself is stated to be totally unaffected by air or damp.

Another process recently introduced with much success is to coat the interior of the pipes with a preparation of glass enamel, thus rendering them perfectly smooth for the passage of sewage, as well as preserving the interior surfaces of the iron. The exterior of the pipes should be well tarred with two coats of coal-tar before being laid.

The following table gives the weight and thickness of strong cast-iron pipes suitable for drain-pipes:—

TABLE OF WEIGHT AND THICKNESS OF CAST-IRON DRAIN-PIPES.

Bore of pipe.	Net length when laid.	Thickness of metal.	Depth of socket.	Thickness of socket.	Weight per pipe.
Inches.	Feet.	Inches.	Inches.	Inches.	Cwt. qr. lb.
4	9	3/8	3	1 1/16	1 1 20
6	9	7/16	3 1/2	1 3/16	2 1 27
9	9	9/16	4	1 3/16	4 2 24

Glazed stoneware pipes are in general use for ordinary drainage purposes, and are well adapted for storm-water drains. For foul drains, however, cast-iron pipes are becoming increasingly used, on account of their clear bore, freedom from distortion, greater length, and consequently fewer joints. The joints of iron pipes, when well made, are perfectly air- and water-tight, and altogether more reliable than the joints of stoneware pipes. Cast-iron drain-pipes should always be used where the ground is soft, swampy, or treacherous, and in places where heavy traffic is anticipated, or where drains pass under buildings.

## THE JANDUS ARC LAMP.

The Jandus arc lamp, which is known in the United States as the "Manhattan," has risen rapidly into favour as a long-arc lamp, giving superior results to the average short-arc lamps. Profs. Houston and Kennelly report that the rate of burning of the positive carbon was .057 in. per working hour, and of the negative .015 in. The power consumed by the lamp at 110 volts represents 616 watts, or .826 electrical horse-power. The arc is reported to be very quiet and to rarely flicker, while the carbons, being completely inclosed, cannot give rise to a fire. The lamp is provided with two glass globes, an outer and an inner, and the carbons are thus consumed in an atmosphere free from uncombined oxygen. The maximum candle-power observed in any position was 1,295 standard candles (British), the carbons being 3/16 in. in diameter, and the average current supplied to the lamp 5.60 amperes. The pressure between the carbons of the lamp when in operation averaged about 80 volts. It is stated that the Jandus arc lamp gives out its light at nearly the maximum luminosity through a zone 40° in width, or about double the width equally illuminated by a short-arc lamp. The Jandus (or Manhattan) lamp appears to be a deserving claimant for public favour. The patentee received the John Scott medal and premium from the Franklin Institute, Philadelphia. Messrs. Drake and Gorham, of 66, Victoria-street, Westminster, are the sole agents in this country.

A new church in connection with the United Methodist Free Church, which is to cost £3,500, is about to be erected at Salisbury.

The Military Lands Act (1892) Amendment Bill, introduced last week, empowers town and county councils to construct buildings and works "at the request and for the purpose of one or more Volunteer corps," and extends for the purposes of the Act the borrowing powers of Volunteer corps and town and county councils under the Military Lands Act, 1892.

On Saturday a new school which has been erected in Beaumont Fee, in the parish of St. Martin, Lincoln, was formally opened by the Dean. It accommodates 250 boys, and has cost, including the site, nearly £2,400. On the ground floor of the building there are two classrooms, one 29ft. 6in. by 21ft. 6in., and the other 21ft. 6in. square; a cloak-room, and a room for the master. The upper floor is appropriated to two schoolrooms, 30ft. and 24ft. long respectively, and each 21ft. 6in. wide. Messrs. Goddard and Sons were the architects, and Messrs. H. S. and W. Close the builders.



## CONTENTS.

"Up-to-Date" Building	335
Domes, and How to Carry Them	335
Cleared Sites and Vacant Plots	336
BUILDING NEWS Designing Club	337
Cast-Iron Columns	337
Concert-Halls and Assembly-Rooms.—XII.	337
Designing of Steel Bridges, Theoretical and Practical.—XXVII.	340
The Surveyors' Institution	341
The McEwan Hall of the Edinburgh University	341
"Cottage Hospitals"	342
Sewerage and Sewage Disposal	343
Notes on Domestic Drainage.—V.	343
The Jandus Arc Lamp	344
The Building News Directory	345
Our Illustrations	345
Obituary	364
Architectural and Archeological Societies	364
Competitions	364
Notice Forms Under the London Building Act, 1894	365
Building Intelligence	365
Engineering Notes	365
Correspondence	366
Inter-communication	367
Legal	367
Legal Intelligence	367
Our Office Table	368
Parliamentary Notes	369
Stained Glass	369
Meetings for the Ensuing Week	369
Trade News	370
Tenders	370

## ILLUSTRATIONS.

LINCOLN CATHEDRAL.—AN INSTITUTE OF ARCHITECTS.—A POLYGONAL BANDSTAND IN WOOD AND IRON.—DESIGNS FOR AN ARCHITECT'S SECRETAIRE AND CHAIR.—NEW WORKHOUSE FOR MILDENHALL, SUFFOLK.—HOUSE AT SUTTON.—OAK PULPIT, ALL SAINTS' CHURCH, CHESTERFIELD.

## Our Illustrations.

## LINCOLN CATHEDRAL.

FREDERICK MACKENZIE was a distinguished draughtsman of architecture, and was well known in conjunction with A. W. N. Pugin, with whom he published "Specimens of Gothic Architecture" in 1816, when he was making some views of Westminster Abbey, published by Ackerman, in coloured aquatint. Mackenzie was articled to John A. Repton, the architect, and his first book was a folio of "Etchings of Landscapes," issued in 1812. He illustrated the "History of the University of Oxford," in two volumes, two years later, and the "History of the University of Cambridge" followed a year or two after, in coloured aquatints. For Britton's "Cathedral Antiquities" he made drawings in five volumes, and Jos. Skelton's "Illustrations of Antiquities of Oxfordshire" were from his pencil in 1827. Mackenzie did I. Ingham's "Memorials of Oxford" ten years later, and in 1841 Le Keux's two volumes of "Memorials of Cambridge," with letterpress by Thomas Wright and H. L. Jones, bear Mackenzie's name. He likewise drew a number of plates for "The Beauties of England and Wales." His water-colour drawings are to be seen in many private collections, and some architects are fortunate possessors of examples of his skill. This drawing of Lincoln Cathedral is in South Kensington Museum, and is typical of its author. Augustus Pugin etched an outline engraving from it, which was finished by William Say in mezzotint, and published in 1829. The late Wyatt Papworth owned the original pencil study, which measures about 16 by 21. Mackenzie died on April 25th, 1854, aged 67.\*

\* The following illustrations of Lincoln Cathedral have appeared in the pages of the BUILDING NEWS: General plan of minster and secular canons' buildings (by the late Mackenzie E. C. Walcott), February 8, 1878; plans of Cathedral, April 2, 1869, and February 6, 1891; west front from the Castle (C. H. Holden), September 21, 1894; Galilee porch and west front (W. H. Bidlake), November 26, 1896; Galilee porch and central tower from south-west (C. E. Mallows), February 6, 1891; rear of west façade from south-east, June 21, 1889; central tower and south-west transept (C. H. Holden), October 5, 1894; south porch (W. H. Wood), February 28, 1879; general view from south-east (Axel H. Haig), April 2, 1869; east end (C. H. Moore), March 21, 1890; cloister and north transept (W. H. Bidlake), February 6, 1891; north door to choir (John Begg), February 6, 1891; chapter-house (H. Harrington), October 19, 1888; Angel choir, interior (pencil sketch, by John Begg), February 6, 1891 (ditto from photograph), May 24, 1889; bay of choir (Sydney Vacher), February 27, 1880; Angel in choir (J. P. Seddon), December 24, 1869; bosses from Angel choir (T. Fred. Pennington), June 21, 1878; chancel gates (W. H. Lethaby), February 27, 1890; door of north choir transept, December 24, 1869; interior of north-west chapel (the late Sir G. Gilbert Scott), February 6, 1885; Bishop Russell's tomb in choir (measured drawing, by Francis Hooper), April 7, 1832; Bishop Wordsworth's tomb (by

## AN INSTITUTE OF ARCHITECTS.

THE Medal of Merit was awarded to this design, submitted by Mr. John Anderson, A.R.I.B.A., in the Institute Soane Medallion Competition. We give the perspective, and first and ground floor plans. Possibly, now the Civil Engineers are lodged palatially, and the Surveyors are about to erect a house for themselves of similar proportions and dignity, the Institute or the Society of Architects may some day wake up to the necessity of doing something more than offer medals and prizes for designs for an "Architectural Institute."

## POLYGONAL BAND-STAND IN WOOD AND IRON: GRISSELL GOLD MEDAL DESIGN.

WE gave the general drawings of this the Gold Medal prize design in this competition for the current session in our issue for Feb. 21 last. To-day we complete the illustration of this useful and suggestive scheme by printing a reproduction of the author's fin. detail, showing the construction of the several parts most thoroughly, with plans of the iron standards and methods of bolting the girders where they meet over the columns. The dome is covered with copper, and the crowning feature is constructed of Dantzic oak painted white, the colour of the ironwork being Royal blue picked out with gold in the enrichments. Mr. James Humphreys Tonge, of York, is the author of the design and winner of the medal.

## "BUILDING NEWS" DESIGNING CLUB: AN ARCHITECT'S SECRETAIRE.

(SEE description on page 337.)

## MILDENHALL UNION: NEW WORKHOUSE.

THESE new buildings, which are grouped together at right angles to the main road leading to Bury St. Edmund's, were officially opened on Dec. 13, 1895. The grounds are entered from the main road through wrought-iron entrance gates and ornamental brick and stone piers. On the right hand is the board-room block, containing spacious board and committee-rooms, clerk's room, waiting room, and lavatory; on the left hand and opposite this building is the porter's lodge and tramp block for males and females, with day and night cells, association wards, receiving wards, &c. Behind these is situated the main block, with the master's house in the centre, three stories high. The right wing, two stories high, accommodates the female paupers, and the left wing the male paupers, with necessary day-rooms, dormitories, attendants' rooms, &c. A range of buildings, one story high, flanking the male paupers', contains the boys' day-rooms, dormitories, &c., and accommodation for married couples, with garden for each. At the back of the master's house is the administrative block, containing spacious kitchen, scullery, and stores for meat, bread, linen, clothes, and dry goods; also a lofty dining hall, and behind the kitchen are located the boiler-house, coal-house, and pump-room. The boiler-house contains two boilers for supplying the whole of the buildings with hot water and steam for the purposes of cooking, warming rooms and corridors, and water supply to baths, sinks, and laundry. The cold-water supply is obtained from a well, and forced by steam-pumps to large tanks in the tank-room, over master's house, and from thence it is distributed to various parts of the buildings. At the back of the grounds, completely isolated from all other buildings, are located the infirmary buildings, containing nurses' administrative department, with lying-in wards at back, and right and left wings for male and female patients, with foul wards for each sex at the extreme ends, quite distinct from general wards. A mortuary is erected on the west side of the site. Airing yards are provided for each sex in the different departments, bounded by high brick walls. All the baths, closets, slop-sinks, and other conveniences are up-to-date in design, and all sanitary blocks are intercepted from main buildings by fresh-air lobbies. All the different departments in the various blocks are connected by covered ways, so that communication can be made between each without being exposed in wet

Bodley and Garner) in retro-choir (from photograph), May 18, 1888; monument to Richard of Gainsborough, architect of Angel choir, in south walk of cloisters, September 7, 1894; details of staircase in cloisters (measured drawing, by J. Hutchings), October 26, 1888; misericords (T. F. Pennington), April 23, 1880; bay of nave, October 23, 1885; eagle lectern (W. H. Bidlake), April 30, 1886; stone arcading (measured drawing, by H. G. Gamble), November 25, 1887; stone beam between west towers, October 28, 1887; 12th century window, November 29, 1878; and 13th-century mouldings, August 25, 1871.

weather. The rainwater is stored in a large rainwater tank near the laundry block, and all the sewerage is conveyed to a tank at the extreme end of the site; all necessary manholes, flushing tanks, and interceptors are provided on the most approved modern system. The buildings are all built with Suffolk white bricks and dressings, quoins, moulded courses, and other finishings in red bricks. The roofs are covered with slates. The whole of the work has been expeditiously carried out by Messrs. Kerridge and Shaw, contractors, Cambridge. The moulded brickwork was supplied from Mr. Brown's brickyard, of Braintree, and Mr. Walter Godfrey has acted as clerk of works. The whole of the buildings have been designed and carried out by Mr. Frank Whitmore, architect, of Chelmsford and Bury St. Edmund's, and county surveyor for West Suffolk. The cost of building and site has been about £11,500.

## HOUSE AT SUTTON COLDFIELD.

THIS house is to be erected on the Four Oaks Park Estate. The view shows the north-east elevation, which is at a right angle to the main road. The walls are to be built hollow, and faced with Ruabon bricks up to the level of first floor. The upper story is to be hung with a rich brown tile made at Wyrley, with a wood fascia all round the house. The gables to be formed in oak half-timber work, filled in with stucco, finished creamy white. The roofs to be covered with a bronzed brown tile from Wyrley. The bargeboards are to be painted green, and the casements, which have projecting frames, are to be finished creamy white. The house contains six bedrooms and dressing-room, housemaid's sink, large bathroom and w.c. on first floor, and four good bedrooms in attics. The estimated cost is £4,800. Mr. Henry E. Farmer, of Wednesbury, is the architect.

## OAK PULPIT, ALL SAINTS' CHURCH, CHESTERFIELD.

THIS handsomely-carved oak pulpit appears to be of the date of James I., about 1610. Little is known of its early history; however, an entry in the registers for the year 1788 says: "The pulpit and desk was decorated anew, the old ornaments having been up 37 years." Before the restoration in 1843, the pulpit stood in the north side of the nave, and there was also the usual "three-decker." In 1843 it was placed near the south-west pillar of the central tower. This pillar caused a draught of cold air to play on to the neck of the preacher, and so about 20 years ago it was removed to its present position on the north side of the chancel. Until about 20 years ago the pulpit possessed a large cushion of Utrecht velvet, with tassels in front, which now is replaced by a modern brass reading-stand. The corkscrew balusters which support the handrail are of mahogany. In the church itself there is a great store of handsome carving, the bench-ends and poppy-heads being especially worthy of notice.

## CHIPS.

The church of St. Simon and St. Jude, Anfield-road, Liverpool, was consecrated on Tuesday week by the Bishop of Liverpool.

Mr. John Hall, architect, of Scarborough, has been honoured by Lord Ripon with the Commission of the Peace for the North Riding of the County of York.

At the half-yearly meeting of governors of the Morley House Convalescent Home, situated at St. Margaret's Bay, Dover, held at Gresham College, E.C., last week, a scheme for extensive alterations in the home, giving a new dining-room and extra dormitories, increasing the beds to about 120 in number, and costing about £4,000, was submitted by the hon. architect, Mr. G. D. Stevenson.

Margate is to have a public park, a site having been given for the purpose by Mr. John Woodward, a Croydon builder. The land is in the Dane valley, and is about 34 acres in extent. Only half of this area will be laid out as a park, 12 acres of the remainder being left for building purposes and the other five utilised as a town pasturage. The ground and house rents are expected to realise sufficient to cover the cost of maintaining the park.

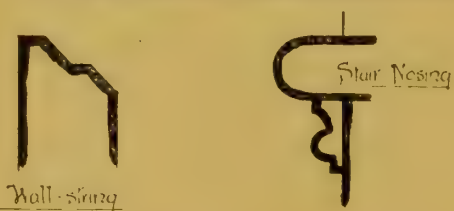
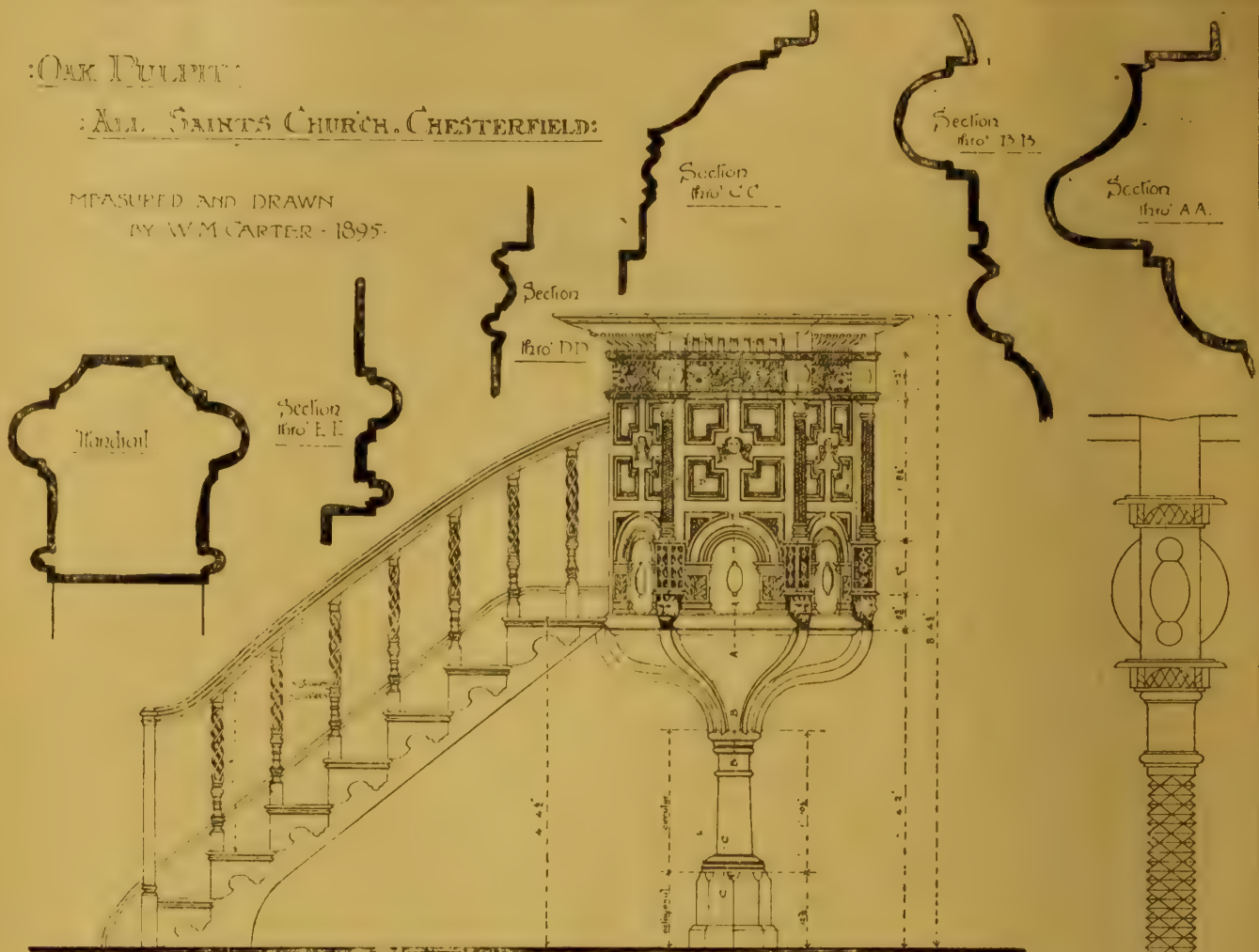
The Public Health (Scotland) Bill, which was introduced and explained by Lord Balfour of Burleigh in the House of Lords on Friday to amend the laws relating to public health in Scotland, has been printed. It consists of 45 clauses, covering 50 pages. The Acts amended are the principal Act of 1867, and the Amendment Acts of 1871, 1875, 1882, 1890, 1891, and the general Public Health Act of 1875. As Lord Balfour explained, this Bill is to be followed by one to consolidate the existing laws,



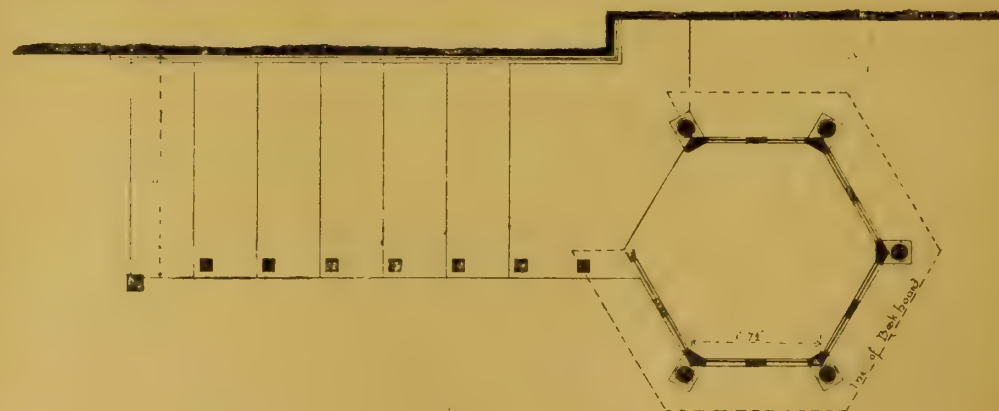
OAK PULPIT:

ALL SAINTS CHURCH, CHESTERFIELD:

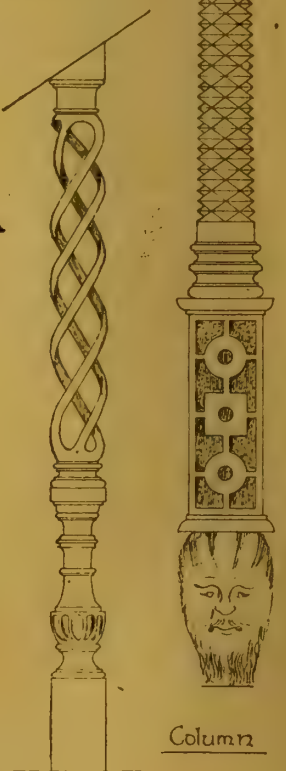
MEASURED AND DRAWN  
BY W. M. CARTER - 1895.



THE ELEVATION:



THE PLAN:



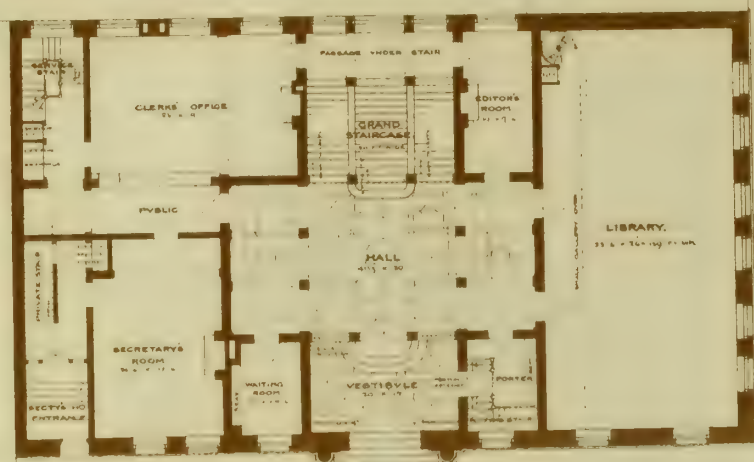
Balustrade

Column







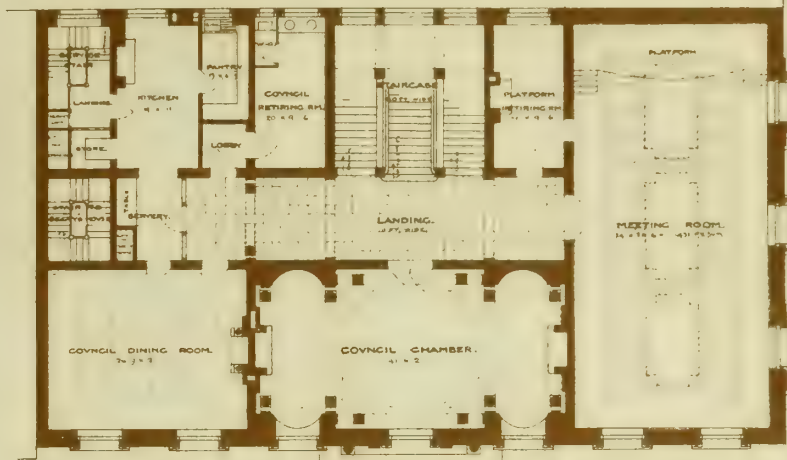


GROVND FLOOR PLAN





MAR 6, 1896.

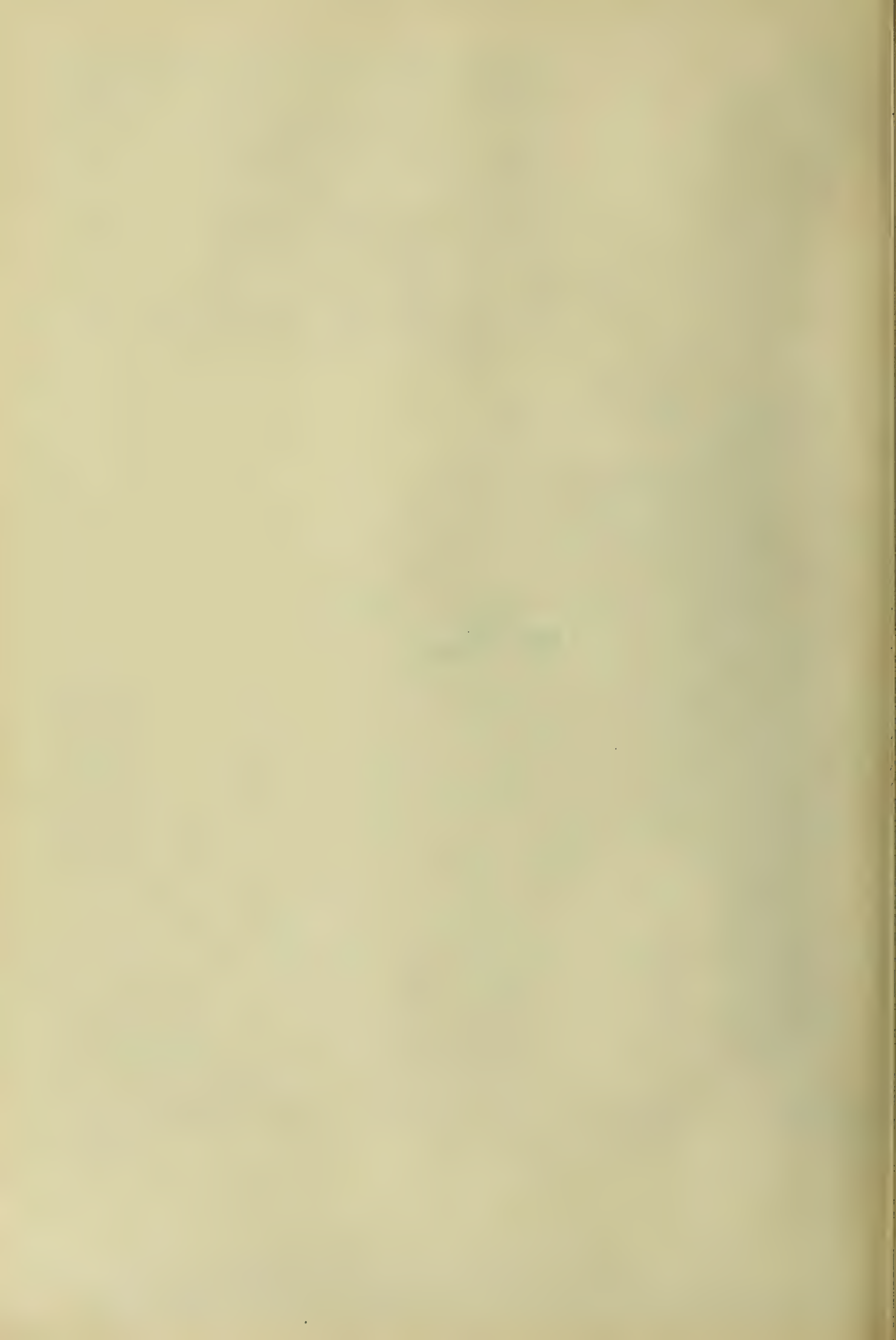


FIRST FLOOR PLAN.



PHOTO TINT













LINCOLN CATHEDRAL

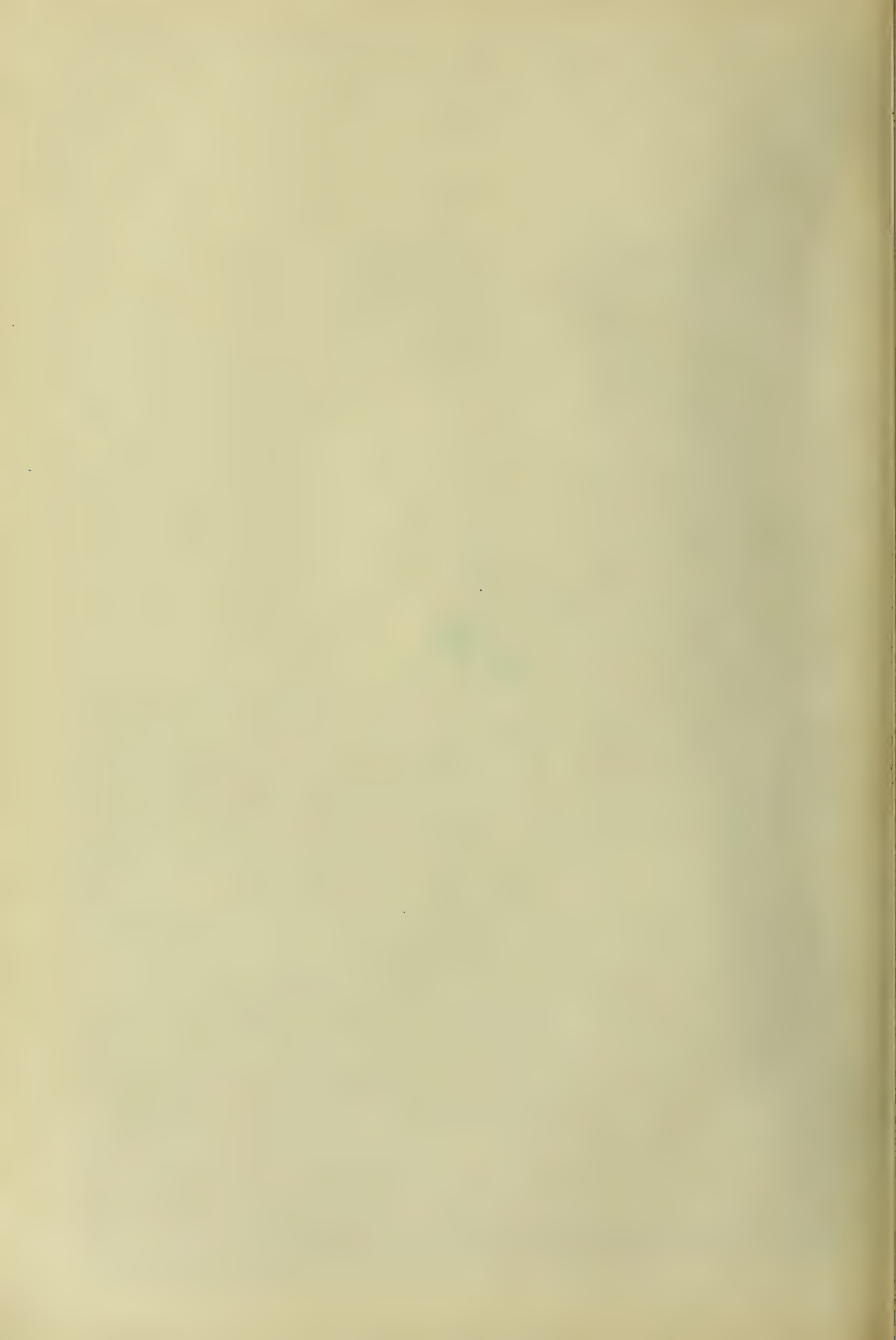


MAR 6, 1896.



"Photo-Tint" by James Akerman & Queen Square London W.C.



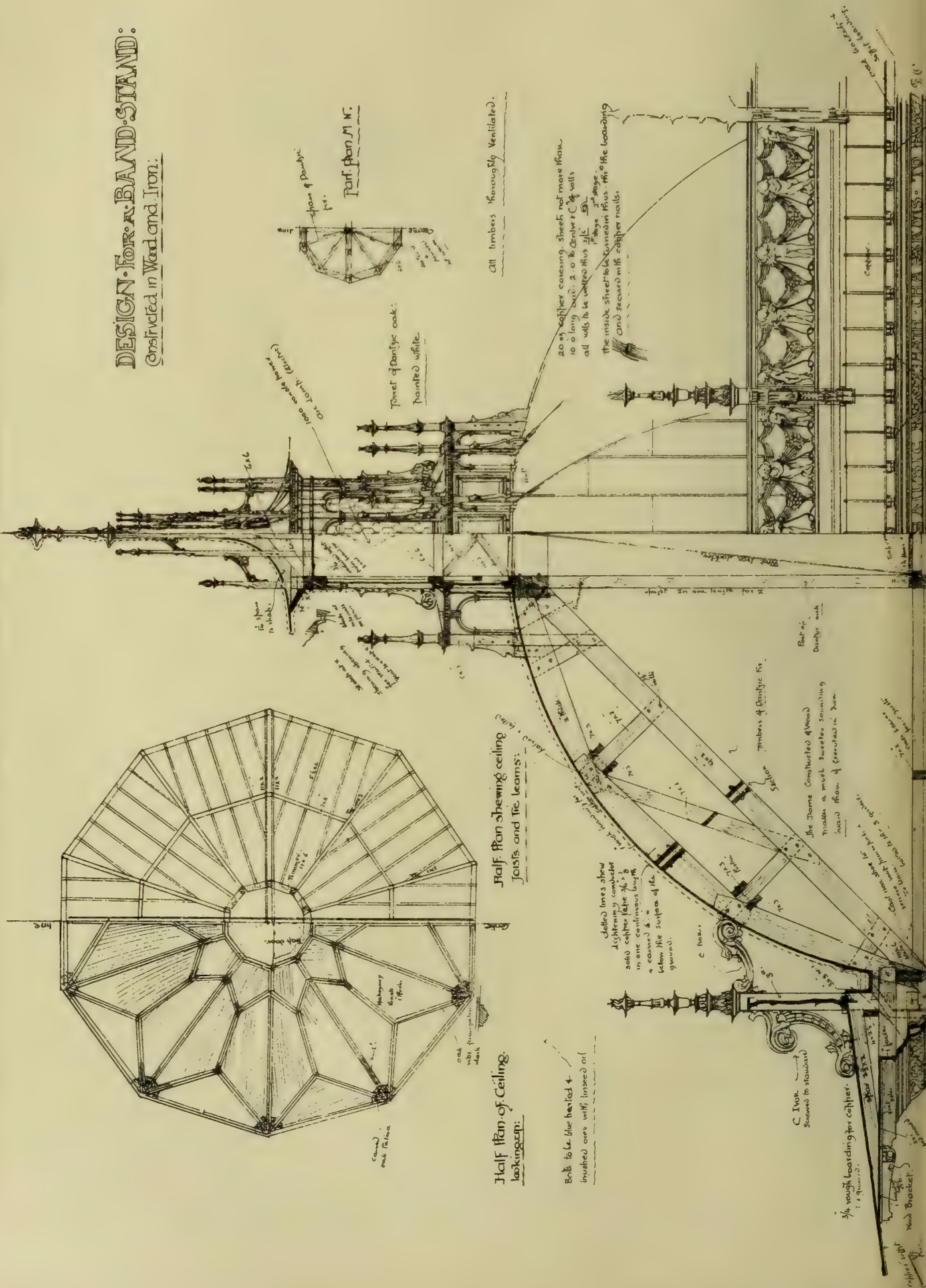








DESIGN FOR A BAND STAND:  
Constructed in Ward and Iron;





the Band stand to be  
painted a coal  
exclusive of painting thus  
Ironwork to be painted  
Royal Blue, with encaustic  
picketed out with sdd.

The soffit boarding and  
brackets, to be painted  
very white.

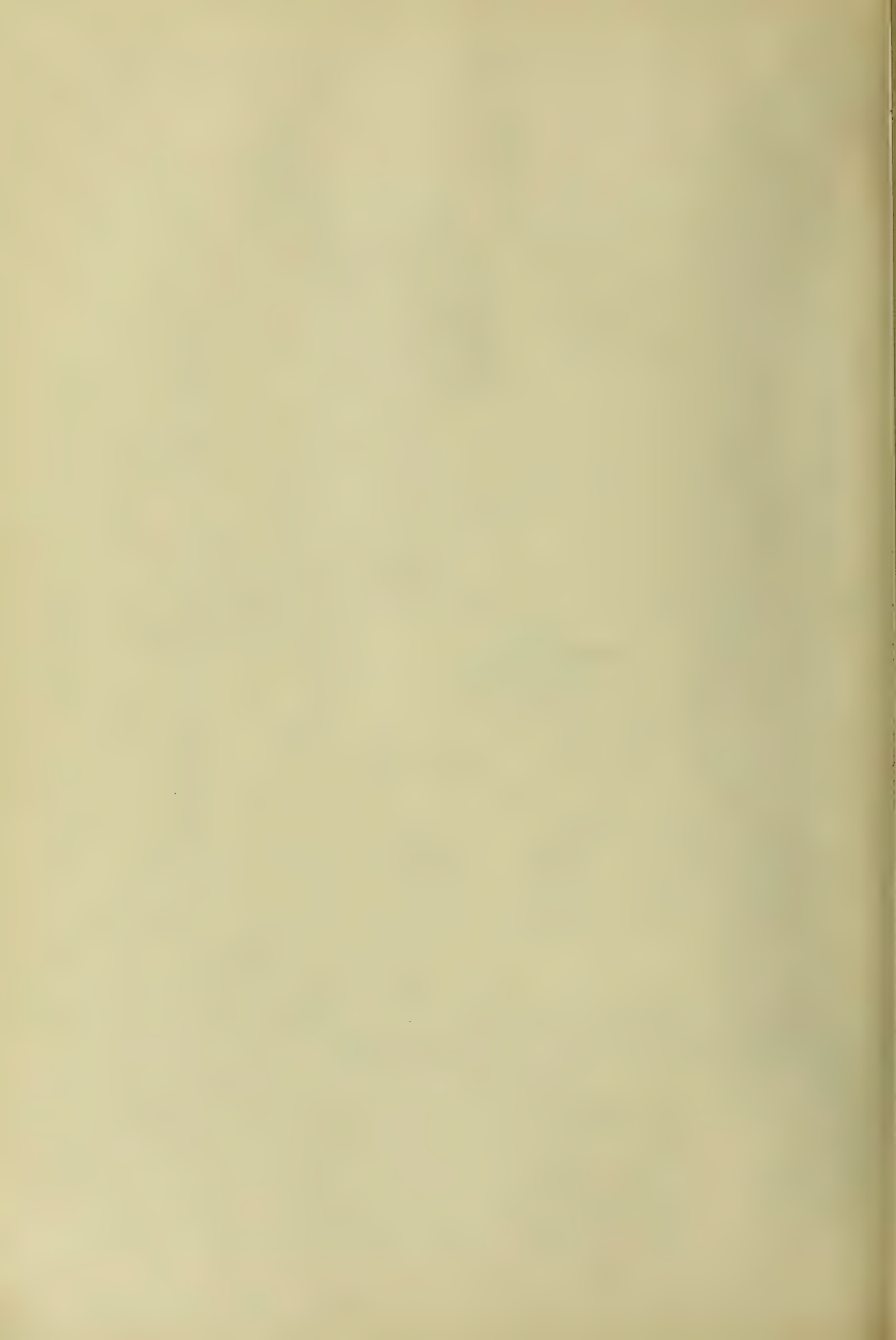
DEVELOPMENT OF BABY  
and half Elevation of Chin  
and Lantern light: ~~not~~

# POLYGONAL BANDSTAND IN WOOD & IRON.

RIBA·GRISSELL·MEDAL PRIZE·DESIGN BY JAS·HUMPHREYS·TONGE·

Photo Lithographed & Printed by James Akerman, 6 Queen's Square, W.





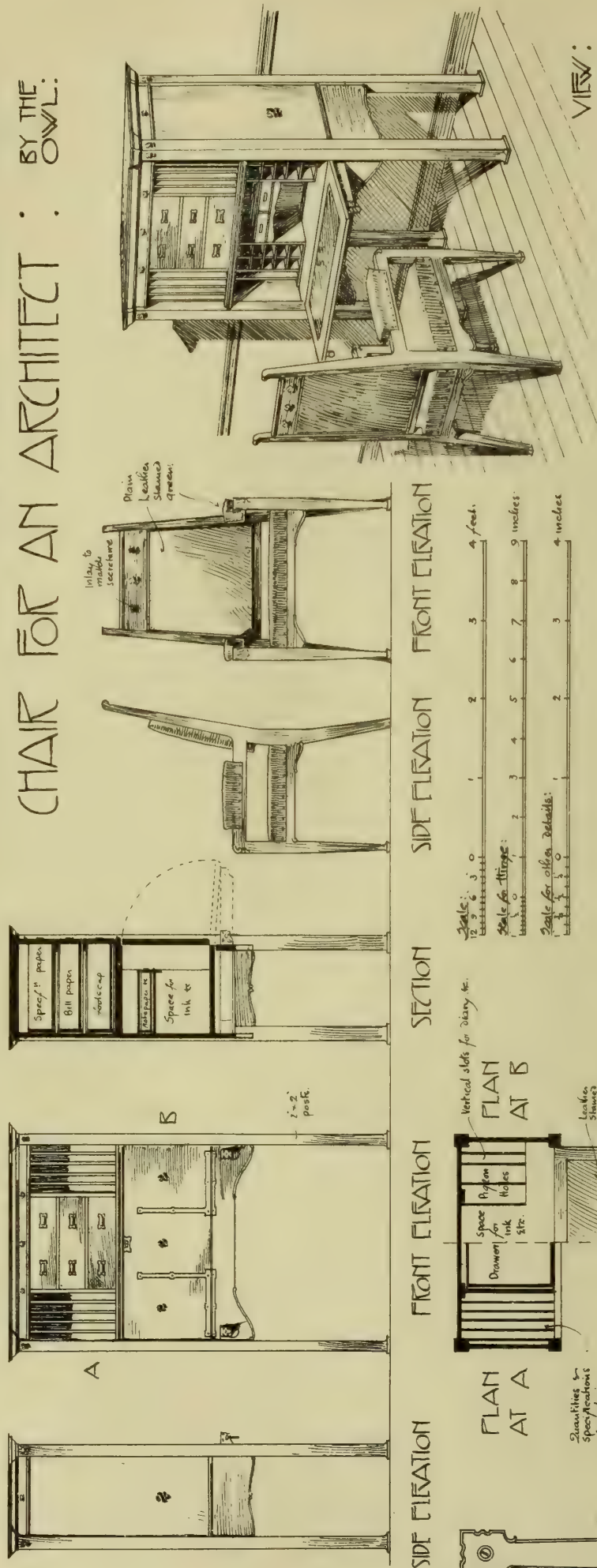




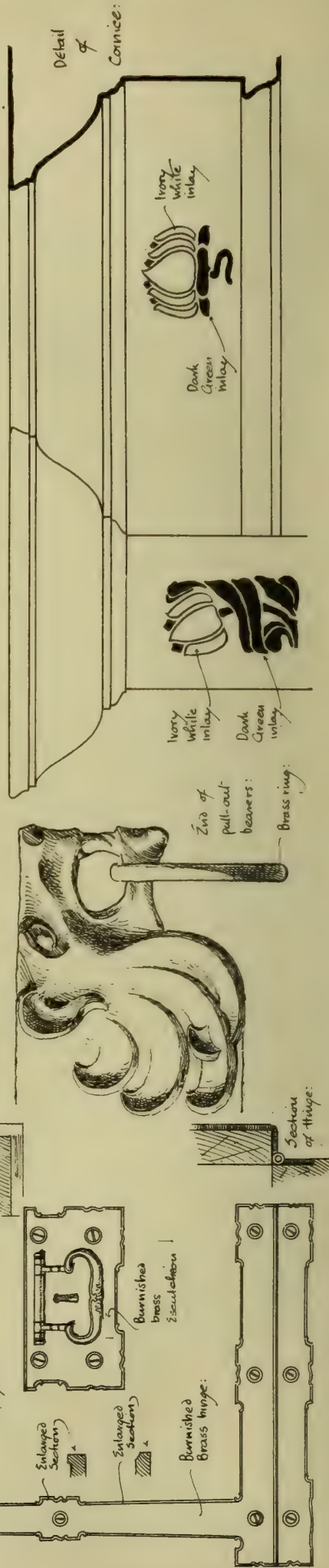


PLACED FIRST

# BND.C.: A SECRETAIRE AND ARM-CHAIR FOR AN ARCHITECT : BY THE OWL:

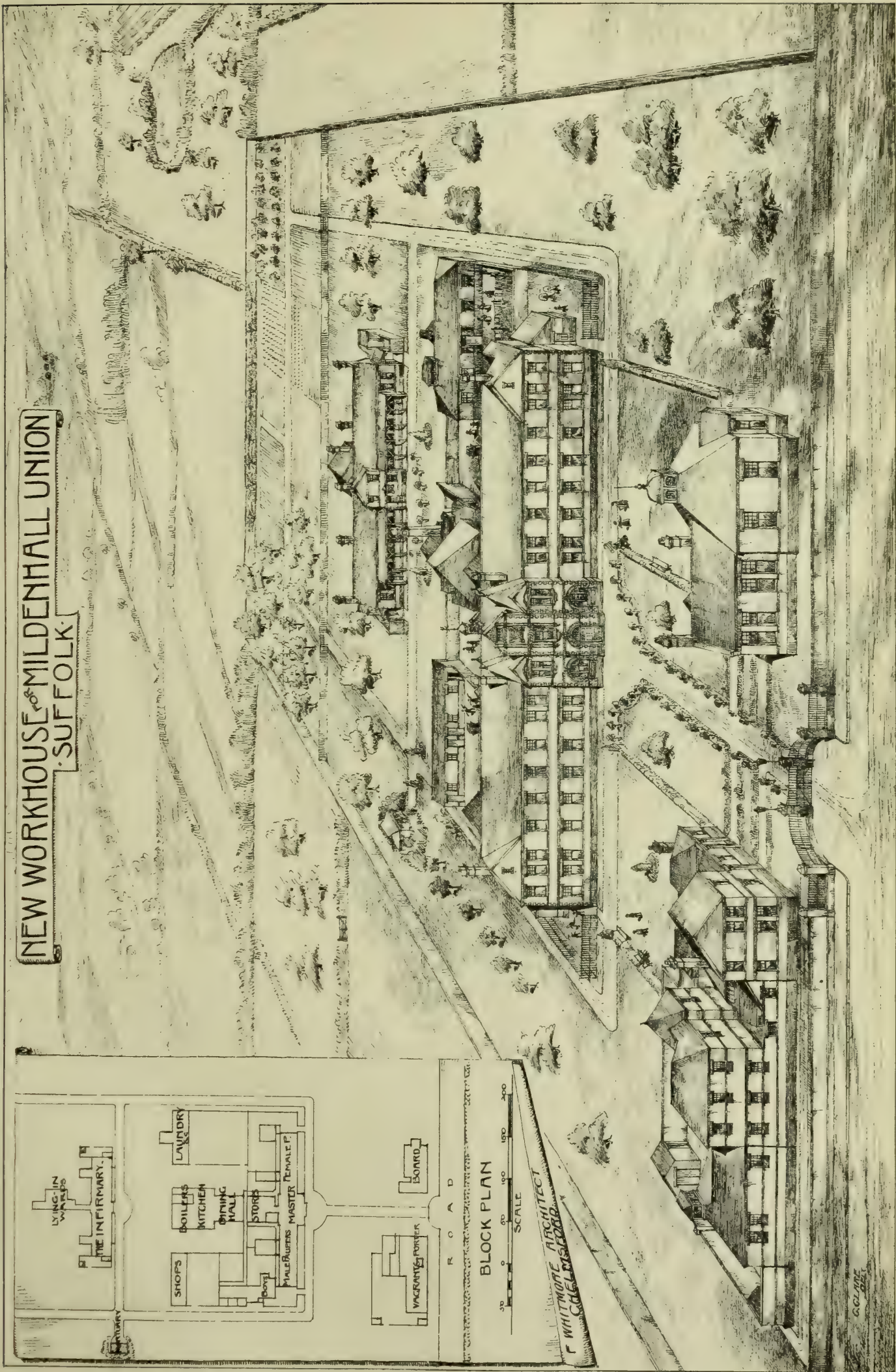
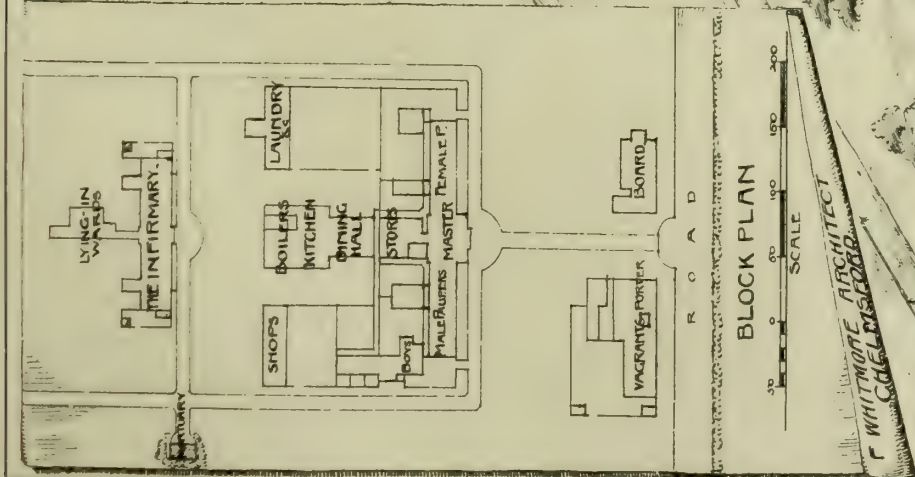


VIEW:





# NEW WORKHOUSE & MILDENHALL UNION SUFFOLK.











HOUSE AT SUTTON  
for A. J. GLOVER ESQ.

GROUND PLAN  
H. D. FARMER ARCHT.  
AND CLARKS WIMBORNE





## OBITUARY.

Mr. JOHN CLUTTON, for many years the principal of the well-known firm of estate agents and surveyors, at 9, Whitehall-place, died on Sunday at Woodhatch House, Reigate, at the advanced age of 86 years. He was the second son of the late Mr. John Clutton, surveyor, and with his relatives created the largest practice in surveying and land agency ever established in this country. In 1818 he was appointed by the Office of Woods and Forests to survey all the Royal forests and woodlands, excepting Windsor. In 1850 he became agent for the estates of the Crown in Surrey, and subsequently for those in a number of other counties. He made extensive purchases of property under the Defence Acts of 1842 and 1860, and it was he who arranged for the acquisition of the estates now forming the site of the Aldershot Camp. So far as regards the southern half of England and Wales, Mr. John Clutton, with his brother, the late Mr. Henry Clutton, acted as surveyor for the Ecclesiastical Commissioners of England during just half a century. He had also among his clients the late and present Dukes of Cambridge, for whom he developed the Combe Park Estate at Wimbledon. In 1868 he actively assisted in founding, and was elected first president of, the Surveyors' Institution, its success being largely due to the broad and liberal policy of administration and management he advocated from the inception of the movement. He became a member of the Royal Agricultural Society of England in 1828, and was elected a foundation life governor in 1890. He had long been regarded as the *doyen* of the surveying profession. The regard with which the deceased was held by his colleagues was evidenced by their presentation to Mrs. Clutton many years ago of a full-length portrait of her husband by the late Sir Francis Grant, then the President of the Royal Academy. The funeral took place at Sidlow Church, near Reigate, yesterday (Thursday) afternoon.

Mr. WILLIAM HENRY COWLIN, the principal of a well-known firm of builders and contractors at Bristol, died on Thursday last week at his residence, Elmview, Ravenswood-road, Redland, at the early age of 28 years. He was the eldest son of the late Mr. William Henry Cowlin, who died in July, 1891, twice president of the National Association of Master Builders, and, like his father, was a prominent member of the local Master Builders' Association. Mr. Cowlin was the youngest member of the city council, having been elected in February last; and was, as the mayor remarked in proposing a vote of condolence to the family, "a great addition to the debating and administrative powers of the corporation." He was also a vice-president of the Raleigh Literary Club at Bristol, and leaves a young widow.

## CHIPS.

In the case of William Eekersley, of Victoria-street, S.W., railway contractor, the discharge from bankruptcy has been suspended for three years, ending Nov. 21, 1898.

The establishment of a music-hall on the site of a bowling-green at the back of the Golden Lion, Camberwell Green, is mooted. The capital is to be £25,000, with £20,000 debentures. It will be built to accommodate 2,000 people from plans drawn by Mr. W. Hancock, who was the architect of the Eastern Empire, Bow.

The Longsole mission-room, erected on land at Barming Heath, was opened on the 24th ult. The building has cost about £160, and is capable of accommodating 100 people. It is composed of wire-woven material, having 3ft. of matchboarding around the interior, and panels marked out with bamboo. The plans were prepared by Mr. Hubert Bensted, F.R.I.B.A., of Maidstone.

At Aldershot, on Monday, an adjourned inquest was held as to the death of Frederick Patrick, a bricklayer, aged 42. He had for some years been in the employ of the local authority, and had been in the habit of connecting house-drains with the main sewer. On Tuesday in last week there was such a connection to be made in Cargate-avenue. A trench had been dug about 20ft. deep by men in the employ of Mr. Kemp, a builder, and the district council foreman went down and found everything apparently safe. While Patrick was making the connection, a slip occurred of the earth round the sewer, and Patrick was pinned. Three workmen went to his assistance, and had just commenced to dig round him when a second slip occurred, several tons of sand falling and burying Patrick, while the other three had a narrow escape. The jury returned a verdict of "Accidental death."

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

**DEVON AND EXETER ARCHITECTURAL SOCIETY.**—The annual meeting of this Society was held on Friday last, the members present being Mr. Arnold Thorne, of Barnstaple, president; Mr. James Crocker, vice-president; Messrs. Charles Cole, S. Dobell, E. J. Harbottle, J. Jerman, J. A. Lucas, J. M. Pinn, O. Ralling, Harbottle Reed (hon. secretary), F. Simpson, C. J. Tait, and E. G. Warren. The annual report showed a satisfactory balance-sheet and a large increase in membership, including 17 from the Three Towns district of Plymouth, Devonport, and Stonehouse, where it is proposed to establish a branch of the Exeter Society, and to further promote this object it was decided that the annual meetings should in future be held alternately in Exeter and Plymouth. A vote of thanks was passed to the retiring president (Mr. A. Thorne) at the conclusion of his address, and he was unanimously re-elected for another year. Mr. J. Crocker was also re-elected vice-president. Messrs. J. Pinn, F. Commis, J. Hine (Plymouth), and H. G. Luff (Devonport) were elected members of the council; Mr. Octavius Ralling, hon. treasurer; and Mr. Harbottle Reed was re-elected hon. secretary.

**EXETER AND DISTRICT BUILDERS' ASSOCIATION.**—The annual dinner of this association was recently held at the Bude Hotel, Exeter. The sheriff (Mr. F. T. Depree), the president of the association, presided, and the vice-chair was occupied by Mr. J. R. Gibbard, chairman of the association. Among those present were Mr. Alderman Force, Councillor Stile, Messrs. J. Sampson, W. Gibson, J. Bolley, S. Castle, N. Pratt (Clyst), L. Smale, W. Wadman, G. Setter, J. Blatchford, A. Passmore, J. Ham, J. Westcott, J. Twigg, G. Herbert, W. Hazell, J. Sampson, D. Wilson, H. Hems, C. Bayley, W. Bayley, G. Hems, J. Moss, S. Frost, A. Zelly, W. Shepherd, T. Cole, C. J. Pepprell, H. L. Lilley, A. Lucas, A. Collard, G. Down, W. Dearman, T. Sale, M. Martin, H. Hill, H. Otton, J. Algar, G. Heywood, A. R. Tucker, F. G. Rice, A. Cole, A. Mills, T. Lee, E. Easton, W. Northcote, and others. Mr. C. J. Pepprell submitted "Her Majesty's Forces." Hon. member Hems and Sergeant Rice, of the 1st R.V., briefly responded. The Rev. Dr. Danger proposed "Success to the Trade and Commerce of Exeter," to which Mr. D. Wilson and Mr. J. Sampson responded. Mr. A. Lucas submitted "The Alderman and Members of the City Council." Alderman Force and Councillor Stile replied. The president submitted "Success to the Exeter and District Builders' Association." Mr. J. R. Gibbard, who responded, said the association was started in 1885. In 1890 there was a protracted strike among the joiners of the city, and in 1892 the employers drew up a code of working rules, which had been answering fairly well. This year there had been no disagreement with the workmen. The building trade throughout the country was improving. Mr. J. Bolley gave "Our President," who replied.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—The eighteenth annual business meeting was held in the Rooms on Tuesday evening, the president, Mr. A. B. Paterson, M.A., in the chair. The committee's report of the past session's work showed that it had been the most successful in the history of the association, 67 new members having been admitted, making a total membership at this date of 165. The treasurer's report was also highly satisfactory, a balance of £35 being at the credit of the association. The office-bearers were then elected as follows:—Mr. Alexander McGibbon, A.R.I.B.A., honorary president; Mr. Wm. Tait Conner, A.R.I.B.A., president; Mr. George Hill, A.R.I.B.A., and Mr. Robert J. Gildard, vice-presidents; Mr. Hugh Dale and Mr. Charles E. Whitelaw, hon. secretaries; Mr. Wm. F. Blaine, hon. treasurer; Mr. John Fairweather, A.R.I.B.A., hon. librarian; Messrs. A. N. Paterson, M.A., Jas. Craigie, Jas. Salmon, and Robert Walker, general committee.

A Local Government Board inquiry was held at Lye on Friday before Col. March into the application of the Hales Owen rural district council for sanction to borrow £4,360 for the sewerage of Lye and £2,965 for the sewerage of Wollescote. The works are to be carried out from plans by Mr. W. Fiddian, engineer to the Upper Stour Valley Drainage Board, into which system they will have an outfall.

## COMPETITIONS.

**BACUP.**—In a limited competition for a new chapel to be erected at Bacup for the United Methodist Free Churches, the designs of Mr. Geo. E. Bolshaw, architect, of Southport and Crewe, have been selected, and he has been engaged to carry out the work, the chapel will be Gothic in design, and provides accommodation for 440 worshippers at an estimated cost of £2,600.

**EXETER.**—A vestry meeting of the parishioners of St. David's was held on Saturday evening to decide as to the selection of a design for proposed rebuilding of the parish church. It was stated that the assessor, Mr. James Brooks, of London, had stated in his award that the plans marked "DI" and "B" were the two best submitted in the competition, adding that design "B" far excels the others in merit. It appeared that design "B" was by Mr. W. Douglas Caroe, of 8A, Whitehall-place, S.W.; and that marked "DI" was by Mr. Harbottle Reed, of Exeter, and not by Mr. Jerman, as had been widely reported. After some discussion, it was resolved *nem. con.* to adopt the design marked "B," subject to the condition that it can be carried out for £12,000, exclusive of organ and reredos and other fittings, and Mr. Caroe was appointed as architect. It was reported that £6,000 had been guaranteed towards the outlay, and that £10,000 would be needed before a start could be made. In reply to questions the chairman explained that the arrangement with the architect contained a provision to the effect that if the church was not commenced within a period of 18 months, for any reason except the refusal of the Chancellor to grant a faculty, the architect might claim 1½ per cent. upon the amount proposed to be expended. The building committee was authorised to take steps to obtain a faculty for the new church, which is to occupy the site of the existing one.

**KINGSTON-ON-THAMES.**—At the meeting of the town council, held on February 25, it was resolved by 15 votes to 12 to adopt the modified plans for the proposed public baths submitted in competition by Messrs. F. J. Smith and M. B. Adams, and recommended for selection by Mr. A. Hessel Tiltman, the assessor. The premium of fifty guineas was voted to the successful architects, who were instructed to prepare a specification and bill of quantities, and to obtain tenders; and it was further decided to apply to the Local Government Board for sanction to borrow £6,000 for carrying out the scheme. The building to be erected in Wood-street will provide a swimming-bath 90ft. by 30ft., capable of being used as a hall, 100ft. long and 46ft. wide from wall to wall, and accommodating 600 persons, exclusive of galleries. There will also be 16 slipper-baths.

**NEW YORK.** The awards of premiums have just been announced in the abortive competition for a new municipal building in City Hall Park, New York. Had not an Act been passed, prohibiting the building of any new edifice in the park, the erection of the new building would have been intrusted to Mr. R. J. Thomas, of New York, and to him is awarded, in lieu of a full commission, the extra consolation prize of 7,000dols. The five equal prizes of 2,000dols. each, offered under the original terms of competition, are awarded to Messrs. E. P. Casey and Ernest Flagg, New York; Rankin and Kellogg, Philadelphia; Gordon, Bragdon, and Orchard, Rochester; and P. D. Weber, Chicago.

A new dry dock is to be constructed at Newport, Mon., on the east side of the Usk, capable of admitting the largest ships, at an estimated cost of £50,000.

The church of St. James, Whitfield, Glossop, has just been reopened, and the enlarged chancel and numerous gifts formally dedicated by the Bishop of Southwell. Besides the greatly-enlarged chancel, a new organ-chamber and vestry, with apparatus-house beneath, have been built, the organ removed from the west gallery, the unsightly part of the gallery removed, the west wall pierced with seven lancet windows, the whole of the nave reseated with open benches of pitchpine, the gallery fronts made to correspond, a baptistery formed, and various smaller improvements effected. The chancel has been furnished entirely with private gifts, including carved-oak choir-stalls, pulpit, reredos, altar, altar-rails, desk, office-book, mats, Glastonbury chair, stained-glass windows in the apse, and baptistery. The cost, with special gifts, will be considerably over £3,000. The architects were Messrs. Norter and Sale, of Derby, and the contractors Messrs. J. and W. Goddard.



## NOTICE FORMS UNDER THE LONDON BUILDING ACT, 1894.

A SERIES of Forms has been prepared for use under certain sections of the London Building Act, 1894, Part VIII., "Rights of Building and Adjoining Owners," by the Practice Standing Committee of the R.I.B.A., who undertook their preparation in consequence of the London County Council's determination to furnish such forms only as were required by officials under the new Act, and to leave individual owners to prepare their own notices for use among themselves. The five forms, distinguished by the letters A, B, C, D, and E, have been approved by the Council of the Institute, and are now published under its authority.

"Form A" is a notice in respect of party structures referred to in Part VIII. of the Act, sections 88 to 92.

"Form B" is a notice of intention to build within 10ft. of, and at a lower level than, an adjoining owner's building, and applies to section 93.

"Form C" is a notice of intention to erect an external wall with footings projecting into an adjoining owner's premises, and relates to section 87, sub-sections 5 and 6.

"Form D" is a notice required when it is proposed to build a party-wall on the line of junction of adjoining lands (section 87, sub-sections 1, 2, and 3). It will be observed that such a wall can only be built with the consent of the adjoining owner, and differs in this respect from work which a building owner has the right to execute.

On the back of Forms A, B, C, and D, definitions and notes applicable to the particular notice are given, and these will be found valuable as a guide in filling up the forms.

"Form E" is for the appointment of a third surveyor under section 91. It is desirable that there should be uniformity of practice in such appointments, and this form will, it is hoped, be found useful.

The rights of the Institute in the forms have been secured, and printed copies may be obtained at 9, Conduit-street, W., price 3d. each; postage extra.

### CHIPS.

The Rothwell School Board have unanimously agreed to adopt the plans submitted by Mr. Richardson, architect, for the enlargement of Stourton Schools, at a cost of nearly £2,000. The extension will consist of a central hall, three additional class-rooms, and an infants' class-room, the whole increasing the accommodation by 260 places.

After considerable discussion the Plymouth board of guardians decided at their last meeting to appoint a committee to consider the question of the erection of a new infirmary at the workhouse, the present one being overcrowded. It was suggested that a new building would cost about £12,000.

At a recent meeting of the governors of the Royal South Hants Infirmary, held at Southampton on Wednesday week, it was decided, after some discussion, to adopt plans by Messrs. Young and Hall, of Doughty-street, W.C., for the reconstruction of the building, at an estimated cost of £19,000.

Mr. Cecil Smith, director of the British School at Athens, states that a committee has been for some time deliberating as to the best method of repairing the damage to the Parthenon brought about chiefly by the earthquakes of last year. A massive scaffolding is already in hand, and will be erected as soon as the Olympic Games are terminated. The expenses of the undertaking are being defrayed by the Archaeological Society of Athens, which is fortunately well supplied with funds.

At Tuesday's meeting of the London County Council, a recommendation of the joint Parliamentary and Water Committees, authorising the moving of the second reading of the various Bills for the transfer of the undertakings of the London water companies to the Council, was adopted after two amendments had been rejected.

During the present week one of the lights in the east window of Ripon Cathedral has been remodelled by inserting a new and lighter groundwork, with a view to ultimately altering the whole of the window after the same pattern, in connection with the scheme for erecting a suitable memorial to the late Dean Fremantle. The work is being carried out by Mr. Hemming from instructions by Sir Arthur Blomfield, A.R.A., whose name, it is stated by the *Guardian*, was suggested to the Dean and Chapter by the Prince of Wales during his visit to the minister in October last. The committee have made an appeal for £500 for altering the window, and £1,500 for Fremantle House.

## Building Intelligence.

**HARBERTON.**—For many years the stump of an ancient cross has stood in the churchyard of Harberton, near Totnes, and it has long been the wish of the vicar to restore the cross to its original proportions. Through the liberality of Mr. R. Harvey, J.P., of Dundridge, and by the skill of Messrs. Harry Hems and Sons, of Exeter, the wish has been realised. The dedication service was held on Friday in Harberton church. The restored cross is of 14th-century workmanship. The steps are of local slate, and the die and what remains of the shaft of Ham Hill stone. The new work is in the same material. What the missing parts were like is now unknown, but the motif for the present work has been the upper part of the churchyard cross at Chewton Mendip, one of the four canopied crosses in Somerset. The sculptured figures on the four faces are all carved in the solid stone. On the west face, the Crucifixion is represented. In the panel upon the opposite face is shown the Adoration of the Magi. In the niches at each end are statues of SS. Andrew and Bartholomew. The restoration has been carried out under the immediate direction of Mr. W. M. Tollitt, of Totnes, architect to the Dundridge Estate.

Ipswich is, says a local correspondent, a very prosperous place. It has developed considerably of late years. Not only have many important buildings for public and commercial purposes been erected, but a large number of villas and smaller houses have sprung up on the outskirts, and work of the kind is still rapidly going on. Ipswich is essentially a business town. Establishments which a score of years ago were well adapted to the purposes for which they were constructed, and adequate to the trade then done, have been added to and improved. During the last six months Messrs. Thos. Parkinson and Son, builders, of St. Margaret's Works, Ipswich, have been making additions to the premises of Messrs. Johnson, Clarke, and Parker, Ltd., boot and shoe manufacturers, Princes-street. The portion dealt with was a one-story block, 129ft. in depth, and with 38ft. and 30ft. frontages to streets, inclosed by three-story premises belonging to the same firm, and this has now been raised to the general height. Messrs. Eade and Johns, of Ipswich, were the architects. The third floor of the new building is lighted from the roof by Messrs. W. Edgcombe Rendle and Co.'s glazing. The ceilings and walls are match-lined, stained, and varnished.

The Good Samaritan Hospital, Glasgow, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Snowdon railway from Llanberis to the summit is almost completed, and an experimental trip was made on Friday, a number of guests being present, on the invitation of Messrs. Holme and King, the contractors, who have been represented on the works by Mr. Rigby. Sir Douglas Fox is the engineer. A viaduct of four arches of 30ft. carries the line over the river near the waterfall, and a second viaduct of 50ft. spans the river. The construction of these has been carried out by Mr. Owen Morris, contractor, Carnarvon, to whom has been intrusted the building of the two intermediate stations, which, in harmony with the surroundings, are to be in the form of chalets. The line, which is five miles in length, will be ready for passenger traffic at Whitsuntide.

A Methodist New Connexion Bethesda Chapel has been built at the corner of Coatsworth-road and Whitehall-road, Gateshead. The style is Decorated Gothic, and the chapel is constructed of brick with terracotta and stone dressings. The main features are the large traceried window in the front gable and the tower and spire at the corner of the two roads. The accommodation is for 550 sittings. At the rear are three vestries, and a church parlour 33ft. by 18ft. The chapel roof is open-timbered, with hammer-beam principals; the benches are open. All the walls are wainscoted, and the timber used throughout is of pitch-pine. The choir-seats are arranged on each side of the communion, with the pulpit in the centre. The contractor for the building was Mr. A. Pringle, of Gateshead, the pulpit and Communion-rail by Mr. T. Stockdale, of Gateshead. The plans, chosen in a limited competition, were prepared by Mr. J. W. Firth, architect, of Oldham, and under his superintendence the work has been carried out; Mr. G. Stockdale, of Gateshead, acting as clerk of works.

## Engineering Notes.

**GLASGOW.**—The district subway—the first underground cable-carway constructed in any part of the world—will be opened to the public early in summer, and it is expected that the Prince of Wales, should his engagements permit, will open the line. The cable cars or tramways will be controlled from the main station at Broomloan-road, Govan, from which point the cars traverse by a circuitous route, by way of Paisley-road, across Eglinton-street, through Coburg-street, beneath the river by tunnel, thence through St. Enoch-square, up Buchanan-street; after which the line proceeds westwards, then turns down Byars-road, again crossing the Clyde, till it reaches the starting-point at Broomloan-road—thus making a complete circuit of the city within the arc described. Apart from claims for structural damage, a sum approaching £300,000 has been paid for the purchase of land and property under which the subway is constructed. The engineers of the undertaking are Messrs. Simpson and Wilson, C.E., and Mr. H. Mayberry, who has also been the company's valuator and arbiter from the origin of the scheme.

**THE SURREY COMMERCIAL DOCKS EXTENSION.**—A party of members of the Civil and Mechanical Engineers' Society visited, on Saturday, the extension works of the Surrey Commercial Docks, designed by Mr. J. Wolfe Barry, C.B., and now being carried out under contract by Messrs. Pearson for some quarter million of money. The past-president (Mr. E. H. G. Brewster) and party were conducted by Mr. Bennett, the resident engineer. The new works are rendered necessary by the need for accommodating vessels of larger size than those formerly employed in the timber and grain trades. The whole peninsula caused by the bend of this part of the Thames is scooped out into a vast series of moderate-sized docks and timber floating pools. Of these the Greenland Dock is the oldest, having been built in 1660, and then known as Howland's Dock. This dock, 1,000ft. long, 500ft. wide, and 17ft. deep, is to be altered and extended by a new dock 845ft. in length, 450ft. wide, with a depth of water of 31ft. 6in. A great part of the excavation has been done, and trenches have been cut for the erection of some parts of the walls of the quays, these walls being of concrete, with a superstructure of hard bricks surmounted by a coping of granite. A new lock is also in progress, 600ft. in length by 80ft. wide, and 34ft. depth of water over the sill. This will form the entrance on one side of the Thames into the new extension dock, which, when completed, will have the structural dam removed, and be thrown, with the Greenland Dock, into one whole. Ultimately, the other docks will be enlarged and deepened so that steamers may pass from one dock to another and into the Surrey Canal itself, or can go out through another lock on the opposite side of the system into the river. The whole water area of the docks is 370 acres, and the quay space over five miles in length.

Probate of the will of the late Lord Leighton was proved on Tuesday, the personal estate being sworn at under £50,000. The will leaves all the property to Lord Leighton's two sisters.

The town council of Southampton have adopted plans by Mr. W. B. G. Bennett, the borough surveyor, for the sewerage of Shirley district, at an estimated cost of £24,000.

The parish church of All Saints, Southampton, which was consecrated in November, 1795, is about to be restored at an estimated cost of £1,000, in accordance with plans by Messrs. Mitchell, Son, and Gutteridge, of that town.

The annual meeting of the Surveyors' and Auctioneers' Clerks' Provident Association was held on Wednesday evening at the Mart, Tokenhouse-yard. Mr. J. H. Sabin presided, and said that during the year the membership had increased. The various funds belonging to the association showed an increase—£200 had been invested during the year, and the committee had decided to invest a further sum of £100. This would bring the nominal value of the investments to £3,400, but their cash value was £3,700. No claim had been made upon the life assurance or the benevolent fund, and the committee were prepared to consider the application of any deserving person connected with the profession, whether a member of the association or not. The report and financial statement were adopted. All the officers were re-elected, with the exception of Mr. Collins, who resigned the honorary secretaryship, and was succeeded by Mr. W. Cudlipp.



## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting architectural or literary matters should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and SIXPENCE for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LII., LIII., LIV., LV., LVI., LVII., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED, M. R. and Co. E. T. Baker, Colonial, E. S. W.—T. R. (Bedford)—S. M. E. and Co.

## Correspondence.

## "THE PROVINCIAL PRACTITIONER."

To the Editor of the BUILDING NEWS.

SIR, In common, probably, with most of your readers, I have greatly enjoyed the delicate irony of the remarks on this subject in your issue of last week. The droll pretence at amazement that anybody should want to look outside his own town for a design when the borough surveyor has already spent months on one, is delicious.

A vision of borough-surveyor's designs by tens and dozens instantly flashes before us all, and we realise, as your contributor intends, what a lucky escape the neighbourhood has had. With no less skill he enforces the same lesson in another way. He holds up before us "Mr. Simpkins, the residential practitioner, who prepared designs on his own responsibility, looking forward to the commission himself." But the scheme goes to competition, and "what are his chances? Ah, what, indeed? Poor Mr. Simpkins! Why did they not sacrifice their building, and make him happy?"

The fun is at its height, however, when the London architect comes in. When he has once gained his provincial competition, his labours, we are told, are at an end. "His building is intrusted to a local contractor or clerk of works, who takes all the responsibility and labour, makes all the detail drawings, and does everything except grant certificates." What an ideal of sublime serenity! We see the great man of the Metropolis sitting on some architectural Olympus, and whistling to the first person that passes to come and build a town-hall for him. Naturally he might prefer a contractor, as having more experience, but failing him, a clerk of works will do; and if there were no clerk of works in sight, why, he would hand

the work over to the postman or the milkman. Such, your contributor would artfully insinuate, is the popular idea of the London architect; such the ease with which he is supposed to amass his ill-gotten millions. He toils not, neither does he spin. He thrusts all the problems he ought to deal with, whether structural or artistic, upon anybody whom chance provides, and accepts the result, and yet, in spite of this, his buildings do not fall, and his reputation rises higher and higher. A better *reductio ad absurdum* of the vulgar superstition none of us could wish. We have most of us struck a blow at it before now, but it will surely never survive this last exposure.

As an architect, however, of provincial origin, article in the North and subsequently trained in the West, I cannot help feeling that my country friends might have been let off a little more lightly. Was it necessary to expose all their weaknesses to the light of day, especially by the needlessly-galling method of pretended excuse? Why make believe that our brethren in the shires are notable for the provincialism of their style, when we know that, with a few eminent exceptions, they are the very last persons who ever think of keeping up local characteristics? Why draw attention, even by contraries, to those too amicable relations which the public in country towns sometimes suppose to exist between them and the builders, and which they try to counteract by calling in designers from a distance? And why show so pointedly the emptiness of the natural—the almost pardonable—excuse which consoles under their failures the less capable of faraway competitors—the excuse, namely, that there was a London assessor, and that they could not get fair play? It is only human to talk so, and it would have been easy to let the talk pass unregarded into silence. But your ironical contributor cannot rest without knocking the bottom out of this fallacy also. He pitilessly holds it up in the face of men and angels, and leaves you, in the same number of the BUILDING NEWS, to set by the side of it the result of a Northumbrian competition, in which a London adjudicator awarded all the first, second, and third premiums to local men! I am, &c.

A COUNTRY AND LONDON ARCHITECT.

## BUILDERS' CLERKS' INSTITUTION OF GREAT BRITAIN.

SIR,—May I be permitted space in your columns to thank the many inquirers and sympathisers who have written to me respecting this Institution? All such will be interested to know that the provisional committee have completed the work of framing rules, &c., and have arranged for the inaugural meeting at St. James's Hall, Piccadilly, on Saturday, March 14th, at 8 p.m., and it is hoped that there will be a good muster, as the work of the Institution should be of the greatest interest to every clerk in the building trade, and all are earnestly invited to attend, and assist, in the adoption of rules, election of officers, and other necessary business.—I am, &c., J. PEARSE BOWDITCH, Hon. Sec. pro tem.

94, Dalberg-road, Brixton, S.W.

## FINISH FOR OAK.

SIR,—During my long experience I have had largely to deal with first-class oakwork, both ecclesiastical and domestic. I have always found oiling unsatisfactory except for large flat horizontal surfaces where the oil will lie evenly, and so that plenty of friction can be obtained very frequently. French polishing is altogether out of the question—it is unsatisfactory at first and does not improve with age.

Where dust is very prevalent it is desirable to wax the surface with beeswax and turpentine (this should be very thin—just sufficient to fill up the pores of the wood, and little, if any, left on the surface), brushed well in and then well rubbed and polished with clean white cloths, taking care to clean out all wax, &c., from mitres, quirks, &c.

The most satisfactory way of finishing in my opinion is as follows:—Never attempt to do it either cheaply or in dusty places. If waincoat is used, it should be the best quality Crown Ligat; no other quality of oak has the same richness of colour and tone; it requires perfect seasoning in an atmosphere free from smoke, and to be worked by skilful joiners used to this class of wood only. All mouldings and ornamental work should be worked on the solid—none should be permitted to be planted—as nothing has a worse effect than framings to be of one colour and grain with mouldings and ornaments of another; the wood

should be carefully selected to harmonise in colour and to be free from dark streaks and other defects; the work left entirely from the plane and not touched with sand-paper, having nothing put upon its surface but left in its natural tint; then it will soon tone down to a beautiful colour, and will improve with age.

All one-sided work, such as framing on walls, should have two or three coats of red-lead paint before fixing, to stop the porosity of the wood, otherwise the grains of the wood will soon get choked with dust, and spoil the colour of the wood. No sprig, nail, or screw-holes to be seen on the wood. All work should be screw-slotted on grounds or specially made irons, for the purpose of secret fixing.

I have recently seen oakwork which was executed under my supervision 40 years ago, and it is as perfect in execution as the day it was finished, clean, and of a charming colour.—I am, &c., R. STEVENSON.

Imperial Chambers, Burton-on-Trent.

March 2.

## RIVERLESS LONDON.

SIR, Your correspondent, Mr. Bradshaw Brown, in calling attention to the absence of facility for Thames passenger traffic, has by no means overstated the pitiable case, but has really made things seem better than they are. He credits Gravesend with being the possessor of a steam ferry, whereas it has nothing of the kind. The corporation of Gravesend once held the ferry rights between Gravesend and Tilbury; but a few years ago they parted with their birthright to the London, Tilbury, and Southend Railway Company, and the only means of crossing the river now is just such as that proverbially miserable railway company affords to its passengers in general. In the good old times of Queen Bess, a Gravesender had only to ring a bell and pay a small extra fee, and the ferry would cross for him at his call at any minute of the day. A modern Gravesender has often to wait from an hour to an hour and a half before he can get from Gravesend to Tilbury, and in foggy weather he may wait for days, unless he chooses to travel round by way of London Bridge. That was never so in the good old days.

That the London County Council should take the whole matter in hand is devoutly to be wished for, and, as an old Gravesender, I do hope they will see their way to come down the river to the extreme limits of our old "Port of London," and include Gravesend and Tilbury, destined as it is possibly in the future to be one of the most important docks of the world. You truly say no other nation in the world would allow its chief highway to be so wasted, and our great highway includes, of course, its piers and docks. Now, failing the Thames Conservancy and all the smaller fry, whom have we to look to, unless it be a paternal Government? Who should be the first to move? Let us see, now, the London County Council showing once again its *raison d'être*, and keep us and itself up to date accordingly.—I am, &c.,

CHARLES COBHAM, F.S.I.

The Shrubbery, Gravesend, March 2.

At Walsall, Col. J. T. Marsh, R.E., on behalf of the Local Government Board, conducted an inquiry, on Friday, with reference to an application by the town council for sanction to borrow £48,000, for purposes of their gas undertaking.

Extensive additions are being made to the public schools in the burgh of Paisley, to cope with the increase of population. Apart from the erection of a new grammar school, to cost over £20,000, and the freeing of the present one for elementary education, the School Board have decided on the erection of an addition to the south school to accommodate about 820 pupils at a cost of £9,500, an addition to Ferguson school for 170 children, and a new school in Carbrook-street for 800 pupils. These were approved of last week, giving accommodation for 1,790 children at a cost of £48,000.

The churchwardens of Brewwood, Staffs, have received the faculty from the Bishop's Court sanctioning the placing of a new peal of eight bells in the tower of the parish church in accordance with the bequest of the late Mr. Charles Docker, who left the sum of £1,000 for this purpose. The contract for supplying the new peal has been placed in the hands of Messrs. John Taylor and Son, of Loughborough, and the old bells were removed from the tower last week and conveyed to Loughborough for the purpose of being melted down and founded into the new ones. The last new bell placed in the tower was in 1762.



## Intercommunication.

### QUESTIONS.

"11482.—Coloured Concrete.—Will some reader kindly give his experience in colouring concrete and Portland cement so as to represent stone? I have seen blocks and mouldings cast in concrete and finished with a thickness of coloured cement; but have not been able to learn what the colouring matter is or how it affects the adhesive and other qualities of the cement. Any information will be acceptable.—Q.

"11483.—Building Stones Report.—Where can Report be seen or obtained of building stones inspected, tested, and recommended for Houses of Parliament in 1886? Will anyone favour me with a reply?—PERSEVERANTO.

### CHIPS.

President Faure inaugurated on Friday the new hôtel-de-ville for the Tenth district of Paris, in the Rue du Faubourg St. Martin, and afterwards presented the cross of the Legion of Honour to M. Rouyer, its architect. The style adopted for the building, which occupies a corner site, is a florid type of Renaissance.

New board schools are being built at Cromer, at a cost of £5,500, from plans by Messrs. Bootle and Otley, of Great Yarmouth. The site of three-quarters of an acre at the junction of three roads cost another £2,000, and accommodation will be provided for 650 children.

The town clerk of Shrewsbury has received a letter from the Secretary of the Local Government Board sanctioning the proposed borrowing of £70,000 for the purpose of carrying out the new sewerage scheme, and the disposal of the sewage by means of a farm at Monkmere, which has been purchased for £12,000, the purchase-money being included in the total amount of the loan.

At a special meeting of the urban council of Selby, held on Friday, Mr. R. B. M. Gray, assistant to the Glasgow city surveyor, was appointed surveyor, nuisance inspector, and waterworks manager to the council. There were 67 applicants.

In response to the appeals made to them by the Historic Society of Lancashire and Cheshire, the Chester Archaeological Society, and other bodies, the town council of Birkenhead, at their last meeting, instructed a committee to inquire into and report upon the present state of the ruins of Birkenhead Priory, founded in 1150, of which the walls of the priors' hall are still standing.

St. Mary's Clyst Church—which has been recently undergoing alterations, chief among which are the placing of the chancel in what was formerly the north transept and separating it from the body of the church by an oak screen—has now been further enriched by the insertion of a stained-glass window in the baptistery, formerly the chancel. The window is divided into two lights by a central mullion, and the subject is the charge to the Disciples after the Resurrection. The window is from the studio of Mr. Frederick Drake, of Exeter, and is the third of a series by that artist.

A Conservative clubhouse is about to be built at Hetton-le-Hole, from plans by Mr. Frank Caws, of Fawcett-street, Sunderland.

The work of renovating the tower of St. James's Church, Bristol, recently determined upon by the vestry, has been taken in hand by Messrs. Wilkin and Son, of Surrey-street, Bristol, and the scaffolding is now in course of erection. The turret is to be rebuilt, and three pinnacles are to be added, the contract also providing for external repairs, at a cost of £700.

The Prince of Wales visited Brighton on Saturday to lay the foundation-stone of a new out-patients' department at the Sussex County Hospital, with alterations to existing buildings, is estimated to cost £25,000.

A new Constitutional Club has just been opened at Ashby, near Brigg. Mr. Bennett, of Sackthorpe, was the contractor for masonry, and Mr. H. G. Varat, of Ashby, carried out the other trade contracts.

The Yarmouth Port and Haven Commissioners have resolved to undertake works (spread over a series of years), which will cost £20,000, to remedy the "scend" in the harbour. The work will consist of an extension of the concrete works at the North Pier at Gorleston and the creation of a spending beach there.

At the last meeting of the Birkenhead Guardians, the alterations at the workhouse were considered. A series of plans prepared by Mr. E. Kirby, architect, of Liverpool, for extensions of the workhouse premises, comprising changes in the school buildings, and nurses' home and infirmary, were examined by the members, and it was decided, on the motion of Mr. Brattan, seconded by Mr. Rothwell, that the plans should be forwarded to the Local Government Board, and recommended for approval and adoption.

## Legal.

### MORTGAGEES IN POSSESSION.

WHEN a mortgagee takes possession of the property mortgaged he must be prepared to pay all rent, rates, taxes, and outgoings. He may not intend to stay in possession save for a short time, and until he can sell the premises. But meanwhile he practically becomes the "owner" and the "occupier," in the sense in which these words are used by the various statutes relating to taxation and to local liabilities. As to ground-rents, of course the mortgagee in possession must pay these, as otherwise he would forfeit his lease, and so lose his security. In regard to the payment due to the parish for paving, &c., of a new road, if a mortgagee is receiving the rack rent of the premises, he at once becomes the owner within the meaning of the Act, and so is liable accordingly. But this liability does not affect the right of the local authority to take the rent from the tenant if it prefers to do so. As to Queen's taxes, again, the collector could levy upon the occupier, if there was one, in the usual way; but if he had gone without paying them, and the mortgagee had been taking the rent as a landlord, he would doubtless have to pay the taxes.

In the recent case of "Madge v. Debenture Corporation" (Times, Feb. 15), a question arose as to the mortgagee's liability for poor-rates. It appeared that the Corporation, as mortgagees of Elise and Co., of Regent-street, had appointed a receiver, who had taken possession of the premises on their behalf, and had carried on the business at a loss for some few months. Just before the stock was sold up, in October last, and the place closed, a quarter's poor-rate became due, and the question for the High Court was whether the Debenture Corporation were so in possession through their receiver as to be legally liable as occupiers for the poor-rates becoming due during that period. The judges now held that as the Corporation had appointed their receiver, who had gone in on their behalf, and as they were to receive the proceeds of the sale held there, they were clearly mortgagees in possession of the premises as occupiers, and as such the parish authorities were entitled to look to them for the payment of the rates.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

T. W.—FREEHOLD.—LEASE.—ALTERATIONS.—A. could raise these questions by bringing an action to compel B. to reinstate premises and for damage to the property. Probably C. could be joined in regard to damages. If A. claims material, he seems to admit the right of B. and C. to do what they did. It is a case in which to consult a local solicitor.

### LEGAL INTELLIGENCE.

CASE UNDER THE NEW LONDON BUILDING ACT.—At the Greenwich Police-court, on the 29th ult., Mr. E. E. Wood, of 24, Nettleton-road, New Cross, appeared to two adjourned summonses taken out at the instance of the London County Council under section 14 of the London Building Act, 1894. Mr. T. Chilvers, from the Solicitor's department, prosecuted, and Mr. Macmorran, Q.C., defended. The last hearing of the case was fully reported in our last issue, p. 333. The defendant had erected a one-story shop and three dwelling-houses in Conington-road, Greenwich, in such a manner that the back external walls and fences of such buildings were at less than the prescribed distance from the centre of a carriageway leading from Albion-street to Albion-grove, Greenwich, and that the defendant had failed to set the buildings back to the prescribed distance in accordance with the requirements of a notice served by the Council. The magistrate, Mr. Marsham, in giving his decision, stated that he was satisfied that the case came within Part II. of the London Building Act, 1894, and he had no doubt the Council had power to take the proceedings under that part of the Act; and he was also of opinion that the back walls of the buildings were external walls within the meaning of section 13, and that the case did not come within the exceptions, and as the defendant had failed to comply with the notice served by the Council under section 14, he must impose a penalty of £2 on each summons, with the costs. Mr. Chilvers then stated there was another summons against the defendant for erecting the buildings in advance of the general line of buildings in Conington-road; but he intimated his willingness to adjourn that summons to allow the defendant time to submit an

application to the Council for their consent. Mr. Macmorran, after consulting with his client, said defendant would accept that offer, and the magistrate therefore adjourned that case for four weeks.

DAMAGES FOR PERSONAL INJURIES.—In the City of London Court, before Mr. Commissioner Kerr, an action was brought, on Wednesday, under the Employers' Liability Act, by Henry Cude, carpenter, Zingari-terrace, Upton Park, to recover £250 against his former employers, Messrs. Lidstone and Sons, builders, Hosier-lane, Smithfield, E.C., for personal injuries sustained. Cude had been in the defendants' service for about three weeks, and on Nov. 16 he was sent to assist in the erection of a house at No. 88, Clerkenwell-road. On the second floor he was doing some carpentering work, and he stepped on to what he thought was a portion of one of the joists. Instead of that, it turned out to be a mortar-board turned upside down, covering a large hole. He fell through the hole, in all a distance of 21ft., breaking five ribs and his breast-bone. His doctor said he would be unable to work for twelve months. The defendants' case was that Cude should not have stepped on to the mortar-board. Mr. Commissioner Kerr awarded plaintiff £150 damages.

LONG-FIRM SWINDLING.—At the Central Criminal Court, on Wednesday week, Frederick Josiah Kelly, 67, carpenter, was convicted of obtaining large quantities of building materials, &c., from divers persons by false pretences, with intent to defraud. The prisoner obtained the goods from tradesmen under the pretence that he was carrying on a *bona fide* business in Hornsey. It was stated by the police that the prisoner was a member of a notorious gang of swindlers, many of whom were undergoing long terms of penal servitude for victimising tradesmen in all parts of the Metropolis. The prisoner had been convicted previously in conjunction with a gang of swindlers, who carried on for a long time a system of defrauding landlords. The Recorder sentenced him to five years' penal servitude.

THE TOWER SUBWAY: ARBITRATOR'S AWARD.—The sum of £11,500 has been awarded by the umpire, Mr. A. R. Stenning, to the Tower Subway Company as compensation for the loss of revenue sustained by the company owing to the opening of the Tower-bridge. The claim was for the sum of £30,000, and the case was heard on January 16, 17, and 27, at the Surveyors' Institution, Great George-street, Westminster. The claim arose under section 35 of the Corporation of London (Tower-bridge) Act, 1885, which gave power to the Tower Subway Company to make such a claim within five years from the opening of the bridge in the event of the tolls being injuriously affected by the opening. Mr. R. Vigers acted as arbitrator on behalf of the claimants, and Mr. R. C. Driver on behalf of the Corporation; but these gentlemen were not called as witnesses, and they did not sit with the umpire. The company called as their witnesses the engineer who constructed the subway, Mr. Greathead, C.E., and five surveyors—Messrs. Tewson, Galsworthy, Garrard, Watney, and Wilkinson, whose valuations ranged from £31,059 to £21,700. The Corporation mainly based their defence on their engineering evidence, comprising Mr. Wolfe Barry, C.B., C.E., Mr. Shelford, C.E., and Mr. Cruttwell, C.E. They at the same time called Mr. Edwin Bousfield, Mr. James Green, and the City Surveyor on the question of value, and the evidence was directed to the point as to what price would have been offered at a public auction if the subway had been in the market on June 30, 1894—the date of the opening of the Tower-bridge—supposing the bridge not then to have been in contemplation. The Corporation also called Mr. Stone, chartered accountant, whose evidence tended to show that the company for many years had been practically insolvent. It should be added that the company retains its property, and the subway remains open for traffic.

LIFTS AND THE LONDON BUILDING ACT.—At the North London Police-court, on Friday, the Hackney Board of Guardians were summoned for putting into use a new building called the married couples' quarters, without first obtaining the approval of the district surveyor. The builders, Joseph Richmond and Co. (Limited), were also summoned for not giving notice of such building operation to the district surveyor. The work in respect of which the builders were summoned was an hydraulic lift, and the contention for the defence was that this was not a "building" in the ordinary acceptance of the term. The district surveyor, in reply to the magistrate, said he would not have taken action in respect of the lift had it not interfered with the external walls of the old building. Mr. Bros said the short point was whether this work affected the building. If it did, then the district surveyor was right in his action; if otherwise, then he was wrong. Mr. Joseph Richmond said he had erected hundreds of lifts similar to the one in question, and never before had been called upon to give notice to surveyors. Mr. Finch, architect, under whose supervision the work was carried out, said it in no way affected the structure. Mr. Bros said Section 78 was very strong as affecting the building, and he thought that notice



should have been given by the builders to the district surveyor. He found in favour of the district surveyor, with 2s. costs. The case against the guardians was adjourned.

**AN ARCHITECT SENTENCED TO HARD LABOUR.**—At the Central Criminal Court on Saturday, Frederick William Fryer, 29, architect, was indicted for obtaining two sums of £25 and £175 respectively by false pretences. The prosecutor, Mr. Bath, an architect, became acquainted with the prisoner through an advertisement for a partner, and after negotiations he agreed to enter into partnership with him, and paid him £25. The prosecutor was to pay the prisoner altogether £500 in respect of the partnership; but, after the partnership deed was drawn up and before it was signed and the balance of the money paid, Mr. Bath saw the prisoner and told him that he had heard that he had been a bankrupt and was an ex-convict. The prisoner assured him that the statement was untrue and absurd, and it was upon receiving this assurance that he signed the deed of partnership and paid the £175, the balance of the £500. Evidence was given that the prisoner at the time had been a bankrupt. The jury found the prisoner Not Guilty of obtaining the £25, but Guilty of obtaining the £175 by false pretences, but recommended him to mercy. The prosecutor desired to join in the recommendation of the jury to mercy on account of the prisoner's wife and children, whom he had supported since the prisoner had been in prison. The Common Serjeant said the prosecutor had been defrauded of a very large sum of money, but had shown the prisoner the greatest kindness and consideration. He sentenced the prisoner to nine months' hard labour.

**BEADELL V. DAW.**—Before Mr. Justice Day and a common jury last week, this action was tried, in which Alfred Thomas Beadell sued Nicholas Fabyan Daw, to recover damages for an alleged breach of warranty and representations that the drains of an unfurnished flat in Cornwall-gardens, Regent's Park, which the plaintiff hired from the defendant, were in a fit and proper condition, whereby he had been induced to take the flat. The plaintiff said he received from defendant's agents assurances that the drains were in good order and the said flat in a good sanitary condition, whereas the plaintiff alleged the drains had been constructed as regarded the position of the closets and their soil-pipes contrary to the by-laws of the London County Council, the sink waste pipes being connected with the drain and not over properly trapped gullies. Further, that the dust-shoot and dust-bin were contrary to the requirements of the vestry. The plaintiff occupied this flat for six months, but his son contracted typhoid fever, of which he died on May 6, 1895, while the plaintiff, his wife, and their daughter had, during the spring of 1895, suffered from enteric fever. The defendant denied that his agents had any authority to give a warranty as to the state of the drains, and he counter-claimed for rent due; but the jury found for the plaintiff, with £100 damages, and judgment was entered for that amount, and also in his favour on the counter-claim.

**A LEEDS ARBITRATION.**—The umpire, Mr. Richard Horsfall, of Halifax, architect and surveyor, has published his award in the arbitration held before him at Leeds Town Hall on the 18th and 19th of December last, between the trustees of the late John Cunningham and the Leeds Corporation, respecting property situate in North-street, at its junction with Melbourne-street and St. Thomas's-row. The arbitrators were Mr. J. M. Fawcett, for the Corporation; and Mr. C. F. Wilkinson for the trustees. The award is £4,288 10s., and the highest value put upon the property by the witnesses for the Corporation was £3,639 1s. 6d.; the lowest for the trustees (Mr. John Hepper's) was £4,943 8s.

**BUILDING ON VAULTS BEYOND FORECOURTS.**—At Bow-street, Mr. Lushington has given his decision in the case in which Messrs. Gorrill, builders, Peacock-street Works, Newington-butts, were charged with having erected a building beyond the general line at 50, Lincoln's Inn-fields, without the written consent of the County Council. Mr. Lushington said the defendants were charged with erecting a structure beyond the general line of buildings without the consent of the Council. There was a forecourt in front of an old building in Lincoln's Inn-fields, and it sloped slightly from the house towards the fields. There were vaults beneath the forecourt. The boundary-wall had not been raised, and skylights had been put into the rooms built on the place of the vaults. The defendants had no right to do what they had done without the consent of the Council. No penalty would be imposed; but they must pay £5 5s. costs.

On Thursday in last week the first schools erected by the Lowestoft School Board were formally opened. One is in Church-road, and will accommodate 260 boys, 250 girls, and 300 infants, and the other in Morton-road has a department for infants on the ground-floor and a mixed school for boys and girls on the first floor. The Church-road school cost £7,536 and that in Morton-road £5,700.

## Our Office Table.

ANOTHER stage has been reached this week in the award of the Royal Gold Medal for the present year. At a special general meeting of the Royal Institute of British Architects held on Monday evening, at 9, Conduit-street, W., the recommendation of the council to present the medal this year to Mr. Ernest George, vice-president, for his executed works as an architect, was unanimously adopted on the motion of the President, Mr. F. C. Penrose, F.R.S., seconded by Mr. Aston Webb. The formal presentation will be made at the closing meeting of the R.I.B.A. for the present session, to be held on Monday, June 22nd.

MR. GOSCHIN'S twenty-two million scheme, if adopted, as seems probable in the present temper of the House, will provide, at the cost of the Income-tax payer, plenty of work during the next few years, not only for the shipwright and dock-yard labourer, but for the Royal Engineers' assistant and the great contractor. Provision is made in the Naval Works Bill, 1896, for the continuation of the works contained in the Naval Works Act, 1895, and various new works are included for the first time, increasing the total outlay from eight and a half to fourteen millions sterling. At Gibraltar it is proposed to increase the length of the dock already begun to 700ft., and to build two additional docks, with a length of 500ft. and 600ft. respectively. The width of the dock entrances will be 95ft., and the depth over sill 33ft. Provision is made for the extension of Keyham naval barracks, so as to provide accommodation for 2,000 officers and men in all. At Chatham it is proposed to build a new hospital with 600 beds, while at Dartmouth it is proposed to replace H.M.S. *Britannia* by a college, to be built on the high land above the town. In view of the magnitude and importance of the works included in the Schedule of the Naval Works Act, a separate department has been formed at the Admiralty to superintend their execution, and Major Pilkington, R.E., C.B., the late Director of Works, has been appointed Civil Engineer-in-Chief in charge of this department. Major Raban, R.E., late Superintending Civil Engineer at Portsmouth, has been appointed Director of Works.

AFTER prolonged agitation against the Bill being promoted in Parliament by the Trustees of the Earl of Dysart dealing with lands in the immediate neighbourhood of Richmond Hill, terms have at last been agreed to by all persons concerned which will have the effect of preserving the famous view from the hill for all time to come. The Richmond Corporation, who are most nearly concerned, have entered into an agreement with the trustees not to oppose their Bill, on consideration that certain concessions are made by the Trustees, and the Ham Urban District Council have just consented also to withhold their opposition. The Trustees have agreed to invest £2,500 in Consols for the endowment of five almshouses for the poor of Ham, and they have agreed to invest a further sum of £4,000 for the maintenance of the National Schools. Besides this they have offered to enlarge the parish churchyard, and to provide a new one at a cost of £2,000, and to give £5,000 and four acres of land towards the proposed sewerage of the district. The Trustees will also hand over the entire control of Ham Common to the Urban District Council. These concessions will benefit the district to the extent of about £15,000, in return for which the Trustees will obtain permission to sell as building sites a portion of these lands.

THE eighty-first annual meeting of the Artists' General Benevolent Institution was held on Friday, at 19, St. James's-street, Mr. J. C. Horsley, R.A., presiding. Mr. Douglas Gordon, the secretary, submitted the report, which showed that the gross receipts in 1895 were £5,220. Of this amount, £500 was a legacy, and was funded, thus leaving an available income of £4,720, and £2,328 was subscribed at the last dinner. During the year £3,842 was distributed among 225 applicants, in sums varying from £10 to £50. The working expenses amounted to about £340. Sir John Millais was elected president of the institution, and a vote of thanks was accorded to him for his services as honorary secretary during the last 27 years. Mr. W. W. Oulless, R.A., was elected hon. sec., and Mr. A. Waterhouse, R.A., was re-elected treasurer.

THE work of clearing the island of Philæ from

débris so as to permit a thorough examination of the ancient monuments, which was intrusted by the Egyptian Government to Captain Lyons, R.E., will probably be completed next month. The satisfactory discovery has been made that the foundations of the main temple of Isis are laid upon the granite rock, being in some places over 21ft. in depth, and the temple has nearly as much masonry below ground as above. The south-eastern colonnade has also its foundations upon the granite, and so far as excavated, they are curious, if not unique, in design. They consist of parallel cross walls some metres high, but varying according to the slope of the rock surface, with large stone slabs placed horizontally upon their tops, and the pillars forming the colonnade are erected upon the slabs. The nilometer is marked in three characters—Demotic, Coptic, and another much older, probably Hieratic, of which a copy has been sent to Berlin for decipherment. A stele was found bearing a trilingual inscription in hieroglyph. No traces have been discovered of any buildings anterior to the Ptolemaic periods. M. de Morgan, Director-general of the Antiquities Department, is engaged upon repairing the great hall of columns at Karnak.

AN important decision was arrived at by the Scottish Society for the Registration of Plumbers at their ninth annual meeting, held in Edinburgh on Friday night, Sir James Russell in the chair—viz., to amalgamate with the National Society, on receiving an undertaking that the amendments on clauses eight and twelve in the Plumbers' Registration Bill, which has been agreed upon, were inserted in the Bill; and that the members of the Scottish Society should be received into the National Society without entrance-fee or annual subscription for this year in the case of persons who had already paid their subscriptions for 1896 to the Scottish Society. A committee was appointed to carry out the arrangements.

THE Trustees of the Peabody Donation Fund, in their annual report for 1895, state that the net gain of the year, from rents and interest, has been £28,434 9s. 9d., which is £1,560 17s. 10d. below that of 1894. This decrease, mainly due to an unusually large expenditure in drainage and other works, and to a further rise of over £400 in the rates, would have appeared much greater, but for the fact that the two new blocks in Stamford-street came into rental. The capital expenditure on land and buildings to the end of the year was £1,250,390 10s. 8d., being an increase of £693 14s. 10d. At the end of the year the trustees had provided 11,367 rooms, besides bath-rooms, laundries, and lavatories. These rooms comprised 5,121 separate dwellings—viz., 76 of four rooms, 1,791 of three rooms, 2,436 of two rooms, and 818 of one room. The number of persons in residence on the 31st of December last was 19,914. The average rent of each dwelling was 4s. 9½d. per week, and of each room 2s. 2d.

Mr. Douglas W. Freshfield writes explaining that £950 has been subscribed towards the cost of the beacon to be erected on Freshwater Down as a memorial to the late Lord Tennyson. The order for the work was given six months ago, the great stone for the shaft has been successfully cut out of the Cornish quarries, and the contractors hope to be able to erect the cross in the course of next autumn. The sum in hand is sufficient for the erection of the monument. Any further subscriptions that may come in will be applied to its further decoration or protection.

The new electric-lighting undertaking of the vestry of the parish of St. Mary, Islington, was inaugurated on Wednesday in the presence of the Lord Mayor and Sheriffs of the City of London. The works are situated in Eden-grove, Holloway. The system adopted is the high tension alternating current transformer, the special feature of which is that it supplies low tension currents on premises by means of transformers from mains charged with high tension current, a great saving of expense being thus effected in regard to both generating stations and mains. The compulsory area named in the Order commences opposite the Angel Tavern, and takes in High-street, Upper-street, and Holloway-road, to Seven Sisters-road and Finsbury Park Station. For the present there are to be four dynamos at work, supplying the electrical equivalent of 15,000 lamps of eight candle-power each. The cost of the undertaking will be £81,354. There are 98 arc lamps, each of 2,500 candle-power, for street lighting along the compulsory area, and there has already been a demand for private supplies of electric lighting, to meet which additional plant will be required.



## PARLIAMENTARY NOTES.

**WORKING MEN'S DWELLINGS BILL.**—In the House of Commons on Wednesday Sir A. Hickman moved the second reading of the Bill to enable working men to acquire their own dwellings. The Bill, which is purely of a permissive character, allows local authorities to make advances, not exceeding £150, to any workman for the purchase of the freehold or leasehold in the dwelling-house he either resides in or intends to reside in. The local authorities, before advancing the money, will have to be assured that a working man for whom a house is to be built or bought really intends to reside in it; they must be satisfied that the house is in good sanitary condition; and they will not be allowed to advance more than £150 to one workman, nor anything at all to the same person on more than one house. The workman assisted will have to find at least a quarter of the whole sum to be spent, and if he is helped to build, he must first acquire the site at his own expense. Sir H. Vincent, who has introduced a Bill this session with the same object, which has been read a first time, seconded the motion. Sir C. Dilke moved, as an amendment, that in such measure the freehold should be vested in public bodies, and not in the individual on whose behalf public moneys were advanced. Mr. John Burns opposed the Bill, he said, lock, stock, and barrel; it helped the wrong people in the wrong way, and was calculated to interfere with the mobility of the labourer by assuming a permanence of employment which did not exist. Mr. Chaplin said that the Government approached the Bill with entire sympathy as to its object, which was that the occupant of a dwelling should be its owner: he recommended that the Bill should be read a second time, and referred to a select committee. Sir C. Dilke's amendment was rejected by 276 to 91, being a majority of 185, and the Bill was then read a second time. The motion to refer the Bill to a select committee could not be put, owing to the lateness of the hour.

Mr. John Oldrid Scott, F.S.A., of Spring-gardens, S.W., has been commissioned to design a memorial to the late Professor Veitch, who for many years occupied the chair of Logic in Glasgow University. The memorial, which will be placed in the University building, will take the form of a mural tablet, with a medallion portrait of the professor.

## STAINED GLASS.

**YORK MINSTER.**—St. William's window, which occupies the northern gable of the eastern transept, has just undergone needed repair. The stonework has been almost entirely renewed, and the glass cleaned, re-lead, and carefully replaced. The cost amounts to about £500. The colouring and the detail of the subjects in the window now stand out with great clearness. The window was, it is believed, a memorial erected by a member or members of the Roos family, of Helmsley. It contains 135 panels, of which 105 are devoted to the pictorial representation of subjects, and the remainder are pieces of tracery, each containing a canopied niche with figure. The five base panels represent kneeling figures of the family, and the next row above depicts various scenes from the life of St. William, whose body was interred in the nave in 1151. A set of panels is devoted to the illustration of the translation of his body in the presence of Edward I. and his queen, the archbishop, and the prelates and nobles. Upwards of 420 studies of the human figure and the ecclesiastical and civil costumes of the period are contained in the window. It is characteristic of the Perpendicular style, measures 79ft. in height and 15ft. 6in. width, and is the finest saints' window of its kind in this country, if not in the world. The window was inserted early in the 15th century, and the glass-painters of the time are unknown. It suffered damage during the siege of the city by the Cromwellian forces, and at other times—notably in so-called restorations. Mr. Knowles, of Stonegate, York, has now repaired the glass, and the minister clerk of works and his staff carried out the stonework.

The town council of Liskeard have elected Mr. T. McMeeken, of that town, borough surveyor and sanitary inspector, at a salary of £65 a year. There were 48 other applicants.

The Clackmannan County Council decided on Friday to form the large area covering the western portion of the county, and including the villages of Menstrie, Cambus, Tullibody, Marchglen, and Sauchie, into a special water-supply district. The water is to be taken from the Loss Burn, on the Ochils behind Demyat Hill at Menstrie. The estimated cost of the scheme is from £12,000 to £13,000. Offers were submitted, but consideration of these was deferred.

## MEETINGS FOR THE ENSUING WEEK.

**SATURDAY TO-MORROW.**—Architectural Association. Visit to the Northampton Institute, St. John-street-road, Clerkenwell, E.C. 3 p.m.

**TUESDAY.**—Institution of Civil Engineers. Discussion on "Littoral Drift." 8 p.m.

Society of Arts. "English Book Illustrations, 1390-70," by Joseph Pennell. 8 p.m.

**WEDNESDAY.**—Society of Arts. "Peasant Life and Industries in Ireland," by Prof. A. C. Haddon. 8 p.m.

Carpenters' Hall. "A Nation's Architecture," by Prof. Banister Fletcher. 8 p.m.

Northern Architectural Association. Annual Meeting. 7.30 p.m.

Edinburgh Architectural Association. "Town and Gown," by Prof. Patrick Geddes. 8 p.m.

Sheffield Society of Architects and Surveyors. "Axiality," by Hugh Stannus, F.R.I.B.A., of London.

**SATURDAY.**—Builders' Clerks' Institution. Inaugural Meeting at St. James's Hall, Piccadilly. 8 p.m.

## CHIPS.

A new board-room and offices are about to be provided for the Market Harborough Board of Guardians from plans by Mr. Goodacre, their architect.

The managers of the Rashcliffe (Church of England) Day Schools, Huddersfield, have decided to build a new school in St. Stephen's-road at a cost of £1,800, and have given instructions to Mr. J. Berry, architect, of Huddersfield, to prepare the plans.

The Burgh Sawmills, off Great Junction-street, Leith, belonging to Messrs. Low, Kinghorn, and Co., were entirely destroyed by fire on Friday, the damage done being estimated at between £5,000 and £6,000.

A meeting in aid of the completion of the new parish church of Hove was held at Hove Town Hall on Monday. The sum of £22,000 has already been subscribed, but £15,000 more is needed to complete the eastern part of the church, and £9,000 for the tower.

The sheriff and police courts at Glasgow are being enlarged and improved at a cost of £9,500.

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## Trade News.

### WAGES MOVEMENTS.

**ARBROATH.**—At a conference between representatives of the master masons of Arbroath and the operatives, it has been agreed that the standard rate of wages for the ensuing year shall be continued at the same rate as at present—namely, 8d. an hour.

**CARPENTERS' PROSPECTS.**—In his monthly report to the members of the Amalgamated Society of Carpenters and Joiners, Mr. F. Chandler, the secretary, expresses his gratification to observe the small percentage of unemployed this month, in striking contrast to the corresponding month of last year, when he recorded no less than 5,156 on the books, nearly 1,000 of whom had been walking the streets for many weeks prior to that date. In order that the full benefit of this improved state of affairs should show itself in the finances of the society, he earnestly appeals to those members who have trade movements pending to spare no effort in trying to effect amicable settlements with their employers, and thus avoid, if possible, having recourse to strikes. In another page of the March report members are requested to call upon the B.S. at Smethwick, Croydon, Rotherham, Nantwich, Rugby, Bingley, or at the G.W.R. new station at Cardiff before seeking employment in these places, and to keep away from Blackpool pending a settlement of the dispute in that town.

**EDINBURGH.**—The operative plasterers obtained, on Monday, an advance of ¼d. per hour, raising the wages to 9d.

**PLYMOUTH.**—The following notice appears in the monthly report of the Operative Stonemasons' Society:—"Portsmouth.—Masons are cautioned against working in Plymouth dockyard under the Directors of Works, as they are only paying at the rate of 4s. 6d. per day, which is 2s. 2d. below the current rate. The penalty will be inflicted on those who work there."

**WOLVERHAMPTON.**—The operative painters of this town went out on strike on Monday, having refused the terms offered by the masters.

### CHIPS.

At a meeting of the Lower Ward District Committee of Lanark County Council, held in Glasgow, on Monday, it was reported that that committee and the committee of the Middle District had come to a mutually satisfactory arrangement for the erection of a joint hospital at Lightburn, near Shettleston. The estimated cost of the institution is about £30,000.

The Lord Mayor and Lady Mayoress, accompanied by the sheriffs, opened on Wednesday St. Giles Public Library, High Holborn. The library adjoins the offices of the St. Giles's Board of Works, and is faced with Ancaster stone. It includes on its various floors a reading-room, lending and reference libraries, a boys' reading-room, and other offices, and has cost £6,000. Mr. W. Rushworth was the architect, and Mr. W. Boyce, of Hackney, the contractor.

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### TENDERS.

\*.\* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**BATH.**—For setting a boiler at the workhouse, for the city board of guardians:—  
Wibley accepted £39 0 0

**BIDEFORD.**—For the erection of baths and washhouses at the workhouse, for the board of guardians:—  
Glover and Co. accepted £250 0 0

**BLAENAU-GARW, S. WALES.**—For forming roads, surface-drains, sewers, &c., for the Fwllcar Building Club (Mr. Ewan Griffiths, secretary). Mr. C. Telford Evans, Esq. Queen-street, Cardiff, architect and surveyor:—

Hatherley and Carr, Bristol	£1,135 0 0
Batchelor and Snowden, Cardiff	857 9 8
Thomas, B.	834 2 6
Davies, T.	811 15 2
Barnes, Chaplin, and Co., Cardiff	724 9 10
Page, E. H., Cardiff	685 11 3
Davies, S., and Son, Blaenau-garw	600 0 0
Evans, B., Cardiff	595 0 0

\* Accepted.

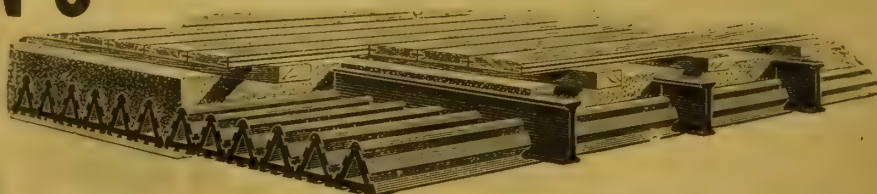
**BRIDLINGTON QUAY.**—For the erection of a People's Palace and Pleasure-grounds on the Rosendale Estate, Quay-road:—

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## THE BUILDING NEWS

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## BLESSINGS IN DISGUISE.

SIR WILLIAM GROVE, a few years ago, gave a brilliant address at the Royal Institution on the advantages of that constant state of struggle in which all things exist. As one illustration, he mentioned the rabbits on two different parts of an estate he had once occupied. On the hill side, where the vegetation was thin, and where they had to work hard for a living, they were healthy, active, and in excellent condition. In the valley, where pasturage was luxuriant, they were affected with disease, were unfit for food, and were often found dead in the fields. Prosperity was their ruin, while their difficulties were blessings in disguise. It is often so in mental as well as in physical matters. The student who is preparing for his examination may wish he had lived in the easy times of his father or his grandfather, when an elementary knowledge of building and the facility of drawing to scale were held enough to make a man an architect, and when the likeliest things to raise him in his profession were "dress and address." Now, before entering a professional society, he has to prove his competence for all sorts of duties, and to show an acquaintance with subjects which he may never have to approach again as long as he lives. He asks what is the object of it, and why he should expend all this effort on the bare chance that some fraction or another of it may finally prove productive. But it is not only productive efforts that are useful. Dumb-bells and gymnastic apparatus are very unproductive pieces of mechanism. Of themselves they neither produce clothing, food, nor shelter, but are justified sufficiently if they bring their users into the best state for producing these and higher things. Examinations at the lowest are mental gymnastics, and even the man who fails for the time to pass them has carried away, perhaps, an increase of strength which he hardly dreams of.

As the young architect gets into practice, the puzzles and problems of his daily work increase. That, at least, is how he is tempted to state the fact. But a truer way of putting it would be to say that his opportunities for distinction, great or small, grow more and more numerous. He is passed on to a higher examination, and he stands among a more advanced class. He is side by side now with his fellow-architects, great and small, and Time, which tries all, is asking them perpetual questions. Just now they do not receive too satisfactory answers. The replies are often stale. To some of Time's present-day problems he is put off with solutions which only suit those he presented 50 or 100, or perhaps 500 years ago, and to others he cannot even succeed in calling attention. Here, then, is the able man's opportunity. Every puzzle, every problem, is a chance for him. Time, with these vexatious-looking riddles of his, is not really his enemy, but his friend. Any one of them may be a stepping-stone to eminence and success; any one of them may be a blessing in disguise.

We have often been told we want a new style. We shall probably be told so more and more, as every phase and modification of the old style is successively tried, wearied of, and thrown aside. But the people who tell us this seem to know little of the way in which styles arise. They do not spring up because some man, or some set of men, deliberately, and in cold blood, set about inventing them. They come "unasked,

unsought," as the reward of honest workers, who are simply dealing, to the very best of their skill, with the common difficulties of their daily life. The Pointed style, for instance, seems to have forced itself, bit by bit, on its inventors, than to have been consciously looked for. They first employed a pointed arch just to help them in their struggle with an often-recurring puzzle in groined vaulting. They meant, apparently, to use it there, and nowhere else. But they found it was strong, and they saw it was beautiful. Then they tried to bring it and the rest of their details into harmony. After many trials it became clear to them that it was the rest of the details, and not the pointed arch, that would have to be changed, and so, by degrees, they developed all the glories of Gothic art. But it was not this they looked for at first. They were simply doing their best at their common duties when they came upon it. Like Saul, the son of Kish, they were seeking their fathers' asses, and they found a kingdom. For a century or more they had been vexed in trying to fix together the ribs of an oblong cross-vault. It was probably the standing worry of the period—the "unmitigated nuisance" which everybody was sick of; but under its forbidding exterior there had been concealed the highest prize which architects have discovered in the last two thousand years.

It is in dealing with the "unmitigated nuisances" of our own day that we are most likely to make some real advance. There are plenty of them. Take, for example, the subject of gallery treatment. Not long ago there was a public competition of some magnitude in which the arrangement of the galleries really ought to have settled the whole planning of the building. Many of the designs submitted had considerable merits, and altogether the competition was quite up to the average. But not a single scheme appeared which showed any earnest attempt to deal with the architectural difficulties of a galleried building. Every designer, in his own special way, had worked out the kind of plan which pleased his fancy, just as if there were going to be no galleries at all. Then, when everything was settled and done, he had crammed in his wooden beams and framing, cutting across his arches and columns, and destroying character, proportion, style, and everything else which the artist feels vitally necessary to preserve. "If you will have galleries," he seemed to say, "why, you must have them. But do not hold me responsible for the result. I wash my hands of the whole affair." "And so say all of us," was the response of his fellow-competitors. Here was Time asking his new question, and the men he examined giving nothing but stale answers to it. They could remember how buildings of this sort were planned when Time did not want galleries, but how to solve them when he does, was more than they could tell. He gave them their chance, and they never even dreamed that it was a chance. So it happens all around us, all day long, and with regard to all sorts of problems. We call them worries and vexations; whereas, if we were strong enough and earnest enough, they are the very things that would lead us up to fame and fortune.

Modern practice is full of these unsolved problems. We cannot walk for five minutes along any new street without observing them. There is the shop-front problem, at which tolerable guesses have been made here and there, but which is generally left as it stands, without even an attempt to master it. There is the fenestration problem, the puzzle of making a street-front architectural when it is nearly all windows and hardly any wall. There is the wide-roof problem, which is always with us in public buildings, where an audience wants to avoid obstruction, and yet where the architect, if he deserves his name, is resolved to satisfy this want with-

out producing a clumsy, shapeless, disproportional structure. It was just such things as these which in the ages of art brought about the changes that are so obvious from one style phase to another. A demand arose for some fresh type of arrangement—great halls, for instance, were required, practically for the first time. They did not work out well in the style of the period. It required sharply pointed arches, narrow and lofty avenues, and altogether tended to height, whereas the natural shape of the hall rather tended to breadth. Before many years, therefore, the style had been modified to suit them. Its lancet arches had dropped into obtusely-pointed ones, and these into four-centred or elliptical ones; while the whole expression of the details had changed from vertical to horizontal. We still mark these results, but few of us see what was their underlying cause. Some people fancy they were merely the results of caprice, the freaks of an ever-prolific fancy. Not at all. They were simply the giving of new answers to new questions, the conquering of new difficulties by new methods. And if we have anything to be grateful for in the constant variety and freshness which meets us in old work, we may thank, first, the wonderful versatility and inventiveness of the workmen; but next, the constantly recurring difficulties which brought these qualities into play. For us, and for them also, they were blessings in disguise.

The modern Englishman is not less versatile, or less inventive, than his ancestors; but he is so in quite a different way. He inherits the endowments of his race, but he uses them chiefly for material, and much more rarely for mental and spiritual, ends. If we wonder what has become of the imagination that raised our cathedrals, and filled our village churches and cottages with thoughts that make them beautiful for ever, we need not look for it far. It has simply passed into another department of action. A century ago, the Englishman found all the physical force of his race too little for the things it wanted to do. He invented steam-engines, and increased it a thousand fold. Then he could not go about fast enough to get his work done, and he invented railways and steamships. It struck him next, that more time could be saved if he could talk to the people he did business with without having actually to meet them or send to them, and then he invented the telegraph. Every day of his life he is still thinking of some new want, or coming across some new difficulty, and making a fortune, or at least, a reputation, by successfully dealing with it. But, unfortunately, he does not give his mind much to building matters. Even their practical and mechanical side he rather turns away from. If, for instance, he had applied himself to the sewage question as earnestly as he did to the railway one, we should never have our rivers polluted as half of them still are, nor our houses poisoned with sewer gas. With the same earnestness, we should find cheaper ways of building, and be making real progress in housing the poorer classes. We are so far from this, that the popular movement just now is everywhere for more restrictions, more regulations, more of everything in building affairs that makes experiments and improvements impracticable. There seems to be a fancy abroad that in this department it is wise to do the very opposite of what we should do in all others; that freedom of invention is dangerous, and that nothing but endless lengths of red-tape will save us. A hundred years ago this was the belief about all sorts of trades and manufactures. Each had to be carried on just as the law was pleased to direct, and all arrived, consequently, at a sort of dead-alive state. Men still living can recollect, for instance, when no bricks might be made of greater size than 150 cubic inches, and when the making of bricks was hedged



about with as many by-laws as the using of them is now. The time came when all this grandmotherly government was done away with, and then trade did indeed expand by leaps and bounds. But a reaction has set in, especially as to building matters, and the mania of the moment is a wish to be everlastingly inspected and corrected.

### COUNTING THE COST.

AS a general rule the cost of a building bears no relation to its merit. If it did, the architect who spent his client's money in the most extravagant way would be the more successful; and those employers and clients who had but little to spend would care nothing for architecture. So that cost must be regarded more in the light of an accidental factor, which those who build ought not to be too anxious about if they get what they want. It is quite possible to spend the same amount over two buildings—one of which shall be a work of architecture, and the other extremely commonplace and ugly. We see the fact proved every day, and this ought to give us confidence in art; that it is a quality or an attribute which is not purchasable by mere money, and that the humblest follower of the art who cannot command wealthy clients has an equal opportunity of proving his artistic ability as his more favoured rival who has the confidence of a millionaire. All competition, in fact, is obviously based on the unpurchasable qualities of genius or art, for if everyone was similarly gifted, there could be little or no inducement to invite contests. So also if, indeed, good architecture or art was a question of quantity, purchasable for money, like ornament, there would be little opportunity for the architect. The clever or expert copyist or machinist would stand a better chance who could turn out the largest quantity at the smallest cost. Thus it is fortunate for the professor of architecture that neither cost nor quantity is a factor in determining meritorious work. Those who want cheap buildings are really striving for quantity. They want houses with a number of rooms—as many, in fact, as would suit a residence of three or four times the size. They, in fact, want the results of cost at the lowest price. These sort of people evidently take a very wrong view, perhaps even worse than those who regard expenditure as the criterion of worth, for they want to cheapen labour and thought. The wanting of a great deal for a small cost is not only wrong in principle, but it is the worst economy. People of small means and less taste generally go in for this sort of building. In these days quantity at little expenditure is the desideratum. For example, in building a house a certain number of rooms has been usually provided on each floor. There is a drawing and dining-room, a library, a kitchen, scullery, and other offices on the ground floor—all very well for a large house with plenty of space; but when a small house is built, the idea that is most popular is to still insist on having all these rooms, but to reduce them in dimensions. However small they individually become, they are supposed to be necessary, and woe be the builder who designs a small dwelling without its "drawing" and "dining-rooms" and "library," for which the entrance hall must be cramped. The desire to have exactly the same number of rooms as are usually found in a big house is supremely ridiculous, and a *reductio ad absurdum* of planning; every little cottage must have its three or more reception rooms, which are not much larger than closets, and scarcely so useful. Everything else is sacrificed. Where do we ever see one decent living-room in the jerry-built house let at from £30 to £40 a year? Mr. and Mrs. Potter with their large family,

however, prefer the cramped rooms because it is the fashion. It is the same with other things. The elevation of a small dwelling must imitate that found in the larger house—gables, bay windows, and the rest of it; while the furniture, instead of being made simpler and more suitable to the smaller rooms, are cheap copies of Chippendale, and are made to fill up every available corner of the room. It seems hard to make people who follow the show-on-a-little principle that they might obtain much better worth for their money if they contented themselves with fewer rooms and simple furniture, and demanded quality rather than quantity. "Cheap" showiness is much worse than costly display, and it is only when architects and their patrons begin to understand the truth that cost is not an equivalent of merit or "cheapness" of restraint, that our architecture will improve. If low price always meant restraint and high price denoted quality, we should soon begin to place more reliance on our estimates and tenders. A standard value would be attached to every work; so long as it was definitely stated or specified, there could be no two estimates for the same building; or the variation, if there were any, would be due to different market values. But in these days there is a sliding scale of cost, as it were, adopted to satisfy different kinds of people. One man is ready to put in a tender 20, 30, or even 50 per cent. lower than another, which can mean nothing else than that a different interpretation is put on the plans or specification; the man who tenders the highest meaning one kind of quality, and the lowest tenderer quite another—in other words, the one means to be honest, the other to scamp. No one could object if the lower tender represented a modified specification or work reduced in quantity or quality; but we all know this is not the case when several builders tender from one set of drawings and quantities. In short, no relation appears to exist between cost and design; every builder puts his own price on the work, just to satisfy people who do not understand good from bad work, or who desire to have all in a cheap building that is to be found in an expensive one. And it must not be forgotten that architects encourage the idea. They are too ready to suit all tastes—Mr. Spender and Mr. Shaver; more often to under-estimate the cost of their designs. The low bidder is the natural consequence. There would be no chance for him if the architect gave a reasonable estimate, and stood firmly by it. But the under-bidder knows his man; what he can venture in tendering 20 or 30 per cent. below anyone else, as he knows how far he can go in substituting inferior materials, or in evading the terms of the contract. If the architect's estimate was more carefully prefaced than it generally is, wide tenders would be exceptional. When we find competing architects adopting a price per foot cube for churches and public offices which would hardly suffice to build a warehouse, it is no wonder that professional estimates are discredited and low-priced buildings are put up to become guides to future estimating and beacons as to what to avoid. "There," observes one, "is Mr. So-and-So's public offices which have been erected at the cost of 9d. per foot cube," but no one seems to be satisfied with the work or the finish of the building. Then the cube price is often misleading. The unit might be fairly approximate in a locality where labour is cheap and bricks or stone plentiful, but inadequate in or near the Metropolis. But it is necessary to put down something, and 6d., 10d., or 1s. 1d. is hazarded, as the case may be, without any more relation to the proposed building than that a work of a similar kind has been erected somewhere at the price. The method of "cubing" is, however, defective: the pricing of the voids is unscientific, as these spaces have no value,

and the cubing, after all, must apply to the solid parts of the building. It has been suggested by an authority that the better and more reliable method of estimating buildings approximately is by pricing only the inclosing walls, roofs, and floors of the spaces at so much per 100sq.ft., taking the walls according to their materials, thickness and finish, foundations, &c.; the floors by the square, including all joists, floorings, &c., roof coverings, including slating, or tiling, and leadwork, trusses, skylights, &c. by the same unit. As we have said before it would be convenient to frame schedules of prices for each of these items according to the class of building and material, and the architect could then estimate his buildings with some degree of accuracy. It is a plan followed by some architects who have by experience learned to affix prices according to circumstances, and to approximate very closely to the actual cost of building. Counting the cost in either of these ways is done mainly, it is said, to protect clients, and to induce people to build who wish to know something of the cost. But by the method of cubing we are doubtful whether very much is attained. The limit of cost is generally fixed before the architect commences his design; but it is very doubtful whether he ever keeps it in view. Certainly, generally he does not begin to count the cost till the plans and specifications are all out, and he manages to make the cubing price tally as much as possible with the sum intended to be spent. If architects kept the proposed expenditure of their buildings before them when designing, we should have something like a reasonable relation between the cost of a building and its actual design. If it was a hospital, care would be taken to adopt the most simple and efficient plan, to design the details with special reference to the cost per bed; if it was a town hall, the proposed sum to be expended would enable the architect, by a simple rule of arithmetic, to discover the area of the hall and offices which he could provide, and the same could be calculated for the accommodation of a church or school. It is a much more correct way than cubing, if the architect takes the trouble to discover the actual cost of hospital wards, barracks, schools, and churches in relation to the number accommodated, or, which is equivalent, the superficial area. Well-ascertained prices per bed for hospital wards, or the cost per head or pupil, from various parts of the country, and for different kinds of buildings, if classified, would supply data or schedules of value.

The estimation of special, artistic, and decorative work opens a wider field for research than we can discuss. It is almost impossible, indeed, for anyone not an expert to say how much an artistic piece of work—say a reredos or a chancel screen—ought to cost. He can only approximate by knowing what similar work has cost under like conditions, and the architect ought to collect prices and tenders for these and like designs. We should suggest, for example, that the prices obtained for such things as ironwork, screens, pulpits, fonts, altar furniture, reredoses, stalls, benches, wall-decoration frescoes, painting vaults and ceilings, stained glass, tessellated tiling, brasswork, should be kept and tabulated for reference, for it is just the want of information on these details which the architect is in need of. He can merely guess at them; they are matters in which special and artistic skill and labour have to be estimated according to the reputation of the artist, in which special education and training are taken into account. But in counting the cost of ordinary architectural work, it is not so difficult to affix a reasonable price: let it at least have some reference to the design and mode of treatment, instead of a mere guess derived from buildings which have nothing in common. Let the intention of the architect control the cost, not that of



the builder who wants a job. The ethics of the architect's estimate, or of expenditure in its relation to building, can only be satisfactorily placed on a fair basis when the profession begin to realise the real relation of expense to design; that every building has its relative value, though it is not always expressed in the cost.

# THE ROYAL INSTITUTE OF PAINTERS IN WATER-COLOURS.

THE opening of these galleries in Piccadilly is the precursor of many other displays, and taking the Institute exhibition as a whole, there is not much to find fault with. The committee have done well in spacing the pictures on the walls, and in hanging them in a more regular manner, as other societies have done, and this improvement is better both for the painters and the public: both are benefited by the reduction of superfluous and inferior work. One of the best pictures in the West Gallery is R. B. Nisbet's "October Landscape" (3), which is distinguished for much breadth of handling and colour in the trees and middle distance. Rich russet and yellow mingle in the autumnal foliage. There is a classic rendering of the rounded trees in the foreground, albeit spoilt by a rather lumpy effect in the under branches. His coast views, "Muchalls" (199 and 222), are clever effects of atmosphere and light. The sunlight and atmosphere in Max Ludby's "Passing Clouds" (11), and the elm-trees in "Evening" (139), bathed in a haze of a summer sunset, are delicate renderings. The President, Sir James Linton, in his work, "Katherine and Petruchio," a Shakespearian study in "The Taming of the Shrew," has given us a scholarly presentment of the beautiful Shrew and Petruchio, who married her, and is said to have curbed her temper. The face of Katherine, turning away from her wooer, is classical in its features and short upper lip; she has a costume richly trimmed with ermine, and wears a green necklace, which, in her petulant mood, she is pulling with her finger. The figure and expression of Petruchio, dressed in a doublet, with sword, are faultless in technique. The smaller picture, "Sweet Anne Page," in the "Merry Wives of Windsor," is reposeful in the attitude of the young maid in her green dress leaning against a brick pier, and holding a basket of rosy apples. The red poppies give a bright note of colour. Fred G. Cotman has an effective landscape with Wells Cathedral in the background, against a sunset sky. Perhaps one of the cleverest subjects is Henry J. Stock's symbolic and subtle suggestion, "The Cascade" (27), in which the painter introduces the falling golden tresses of a nymph to represent a waterfall. James Orrock, in his vigorous and forcible style, sends a large work, "On Worthing Beach," which occupies a centre place. The qualities of freshness and colour in the turbulent waves and fishing-boats are characteristic of the master. His other subject is "A Windmill near Worthing" (586), having much of the vigour, handling, and sense of colour of Constable in it. Bernard Evans, another master of landscape, gives us a noble coast view; "A December Afternoon, Cannes" (76), an amphitheatre of hills and foliage inclosing the sea, painted with much solidity and power; and in the East Gallery, "St. Cezaire, near Cannes" (557), an imposing ravine between hills, in deep shadow, admirable in depth and tone. In the West Gallery we notice two of E. M. Wimperis's broadly-painted and masterly landscapes: (78) "Old Road, Pen-y-Gwryd," and "Shadows on the Sea" (106), a powerful and effective piece of glistening sea from shadowed land; A. W. Weedon's clever view of "Lewes, Sussex" (86), the distant roofs reflecting the light;

Claude Hayes' "Haymaking" (87), and "Norfolk Common" (95); Anderson Hague's "Crossing the Brook" (105), a subtle and powerful landscape, in which the effects of scumbling and abrasure of surface and other technicalities have been employed. Professor Hans von Bartels is a comparatively unknown contributor. His "Fish-Market on the Dutch Coast" (150), is full of delightful realism, reminding us of the Newlyn school in its fresh colour. Clever in composition and grouping of the fisherfolk, with their catch of plaice and gurnet, we equally admire the sparkling freshness and colour of the fish, and the big ray which one woman is carrying in the foreground.

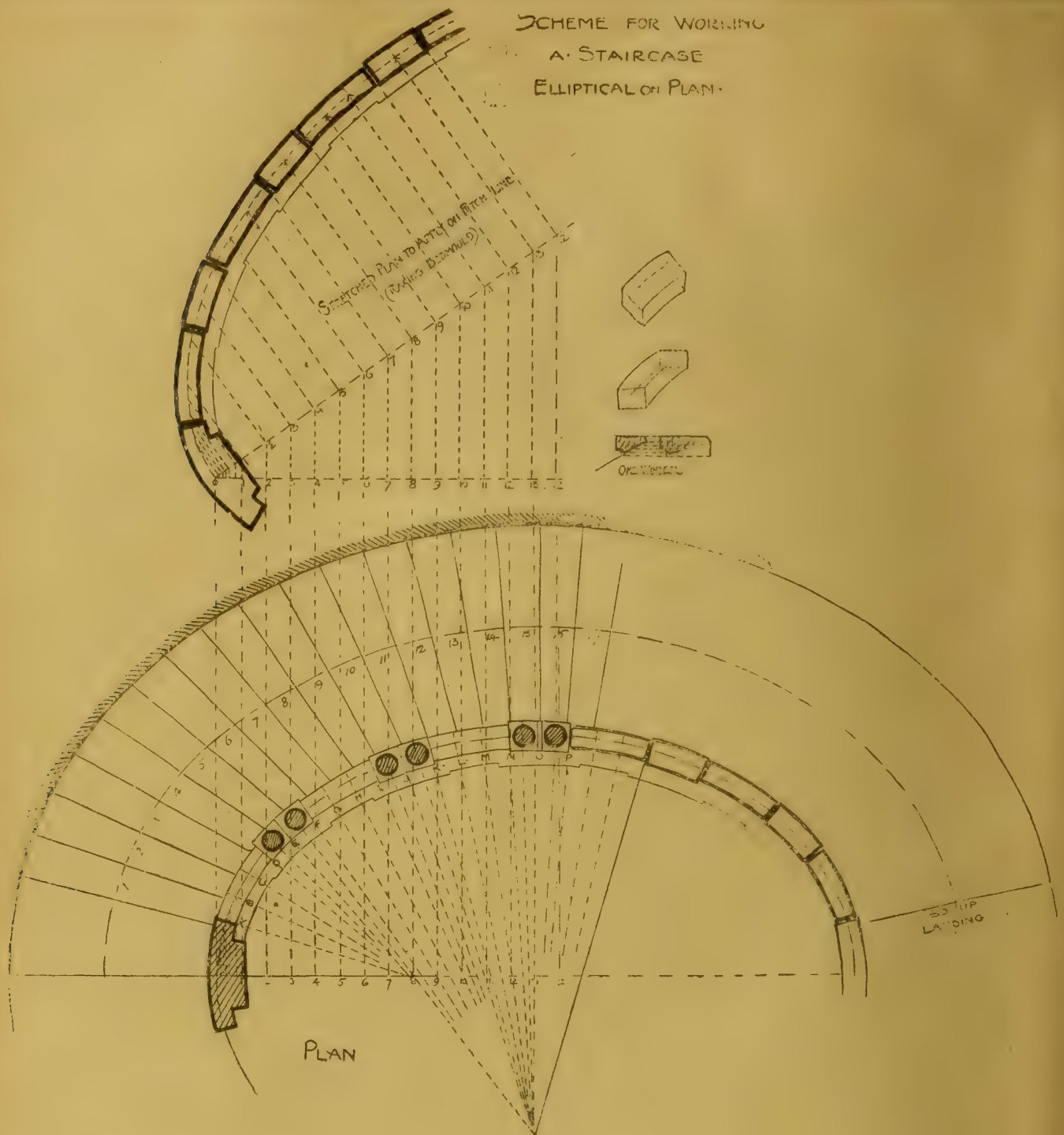
A want of repose is the one fault in Edmund G. Warren's "Hay Time, Devon," despite the leafy detail and glimmer of sunlight through the trees. B. E. Minns (67) is vigorous in his view of "The Gap," Sydney, and the colour is good; Edwin Hayes charms by his "Dutch Boats, Katwyck" (73), and "Dutch Craft" (107), both delightful in colour and atmosphere; Carlton Smith's large centre picture, "The Mother," is touching, and the soft colour and lighting pleasing; and we must also notice St. George Hare's bright, smiling-faced little girl, clad in red, relieved only by a black muff and a sprig of holly (159). Edward Read, in "A Winter's Twilight," dexterously represents a snow-covered scene, with the glimmer of cottage lights over the dreary landscape, and he points a moral in the pathetic and lonely figure of a woman with a child in her arms sitting on the roadside, with her eyes fixed on the distant cottage lights of the village, and who utters the petition, "Forgive our Trespasses." F. Stuart Richardson's "Morning after Rain, Dutch Coast" (172), is exquisite in colour and its fresh, glistening light.

In the central gallery, Miss A. M. Youngman's delightful flower study, "An English Winter" (179), Mrs. Bessie Johnson's "Magdalen College, Oxford" (174), J. Aumonier's "Chalk Pit" (186), Madam Hegg de Lauderzett's "Eilets," crisply handled, and of charming colour (192), Miss Frances Nesbitt's "Flower Girls," and other ladies' work; H. Caffieri's luminous "Children Bathing," a fine piece of sunlight; W. E. Croxford's "Smith's Shop" (215), are creditable. Frank Walton's "Summer Sea, Kynance," and his view of the same rocks (279), are delightfully sharp and finished in the execution of rocks and foreground vegetation. E. J. Gregory, A.R.A., has a delicately-drawn study of "Master Newall" (229). The little blue-eyed boy reposing on an armchair of blue-figured cretonne, with a kitten in his cap, with his toys around him, is subtle in its rendering of the light on the child's face; but the tones of white and blue chintz are trying. William Rainey's "Cornish Garden" is a clever bit of sunlit effect, with a glimpse of blue sea. Luminous and full of reflected light is C. S. Mottram's "Down to the Cove" (163); and we must notice with approbation T. Hope McLachlan's "Moonrise" (234), Alfred Parson's "Cottage Pets," a dexterous rendering of cottage life; Anna Nordgren's "The Letter," a very forcible, charming study of an old woman reading a letter by a cottage window; W. Hatherell's "Mending Nets" (244), Edgar Bundy's "Conquerors" (266), and "Urbs in Rure" (256), two sisters in olive-green walking through a village street; J. C. Dollman's clever study of a black cat in a field of yellow crocuses (263). Bright and clever is Hamilton Macallum's sketch "Cauliflowers for Pickles" (280). John Scott's fairy tale, "A Hopeless Task," is very charmingly painted, and is one of the best figure subjects; Walter Langley's "Once upon a Time" (320) is full of quiet pathos, but hackneyed. The president's study, "Jessica," from the "Merchant of Venice" (333), is one of those delicate and graceful

figures which Sir James delights to paint, perhaps a little cold and unsympathetic—a want which we can overlook for the charm of colour, the greens and yellows, and the textures of the robe which the young daughter of Shylock wears. As usual, the president appeals to us rather in his technique than in dramatic power. Frank Dadd has one of his facetious subjects—a good-tempered country farmer receiving advice from his solicitor (310); the expression on the face of the robust old countryman is one of doubtful surrender. C. Green's "Sailor's Wedding" is equal to his other illustrations of comedy; the faces of the bride and assembled visitors are wonderfully expressive, but the smoothness of the textures almost suggests the chromo. We must also mention W. T. B. Roberts's feeling drawing of the "Choir, Winchester Cathedral" (356), in which the famous altar screen and stalls are cleverly sketched. The vice-president's "Crossing the Marsh" (375) is full of vigour, breezy and fresh.

William Rainey's "Wanderers," in the East Gallery (397), is a work of realism and strength of colour. The tired-out vagrants have pitched their encampment in the marshy ground by the side of a river, where a little scrubby vegetation affords them shelter. It is twilight; an old man sits resting his weary head, and his daughter stands untying her hair, while the rest of the family are reposing. T. Hope McLachlan (400) paints a weary peasant carrying a load over a dark, bleak hillside, with his accustomed strength. Other pictures in the same vein of thought are G. Wetherbee's "Mother and Child" (394), and "Arrested," by Arthur Burrington, a painter whose work has already made a mark, though he is not a member. "Arrested" (458) tells its own tale, and the narrative is dramatically depicted by Mr. Burrington with much pathos. The light on the figures of the red-coated sergeant and the movement and colour, are admirable. Works that attract attention, and which we can only barely mention, are "The Village Forge," by Max Ludby (419); Miss Marian Chase's "The Past and To-Day" (422); Edward C. Clifford's clever narrative subject, "The Quack," excellent in its old Georgian costume and expression of the victimised; the Vice-President's powerful landscape in North Wales (451); David Green's very clever sketch of the "Fish Quay, Whitby"; Arthur Severn's "Coniston Lake" (480); H. R. Steer's "Swift to its Close ebbs out Life's Little Day" (505). John Fulleylove contributes one or two brilliant sketches of Paris and Venice, and his drawing of the "British Museum" (513) is a careful and accurate delineation of the porticoed front. E. Davies's very powerfully depicted view, "A Welsh Hillside," is one of the finest studies of mountain scenery in the gallery, in the colour and handling of rocks. Near it, the imaginative picture, "The Ivory Gate and Golden" (521), by Henry M. Rheam, is a relief from the realistic. The luminous and delicate white drapery, and the artistic conception of the golden-haired maiden who stands and holds aside the white curtain diaped with gold, is decorative and figurative at least. The child's face is delightfully painted; also her rich robe of bright green, embroidered with gold. Nothing can be more subtle than the tangled bushes and excellent colour in Albert Kinsley's "Fringe of the Moor" (527). A clever figure study by Arthur Burrington (547) may be named; also Mrs. Patty Townsend Johnson's "Between the Tides"—a delightful piece of colour, atmosphere, and sea-beach, with fisherfolk, at low tide; under which, in the centre, hangs Bernard Evans' View near Cannes, already mentioned. Thos. Huson's "Beachy Head" (565), Miss Gertrude Demain Hammond's graceful figure subject (569), and James Orrock's "Old Mill" (586) are other noticeable pictures.





#### MASONRY AND STONE-CUTTING.

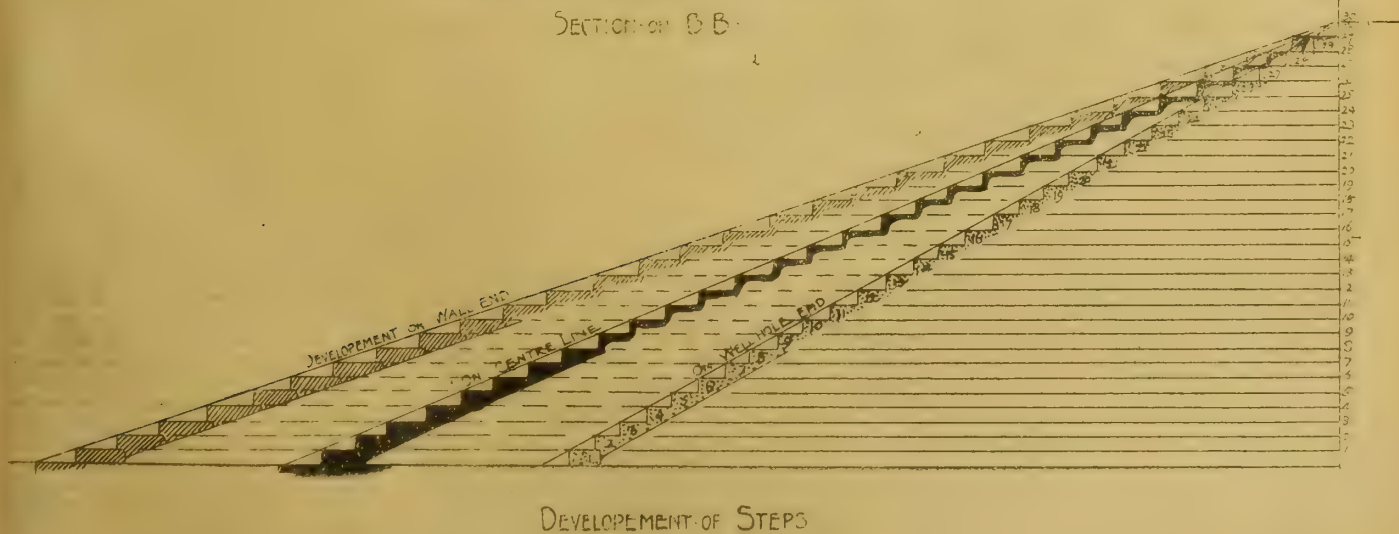
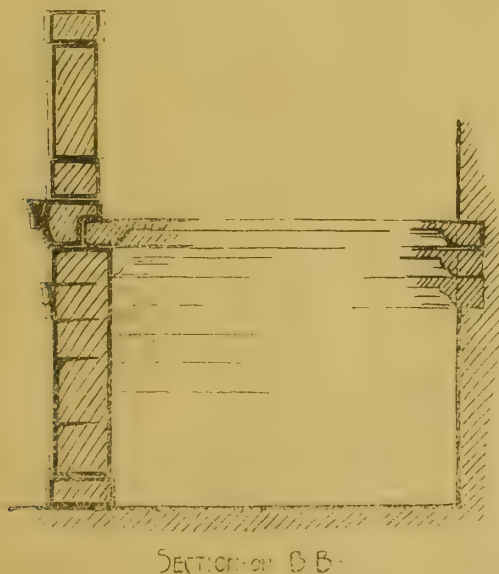
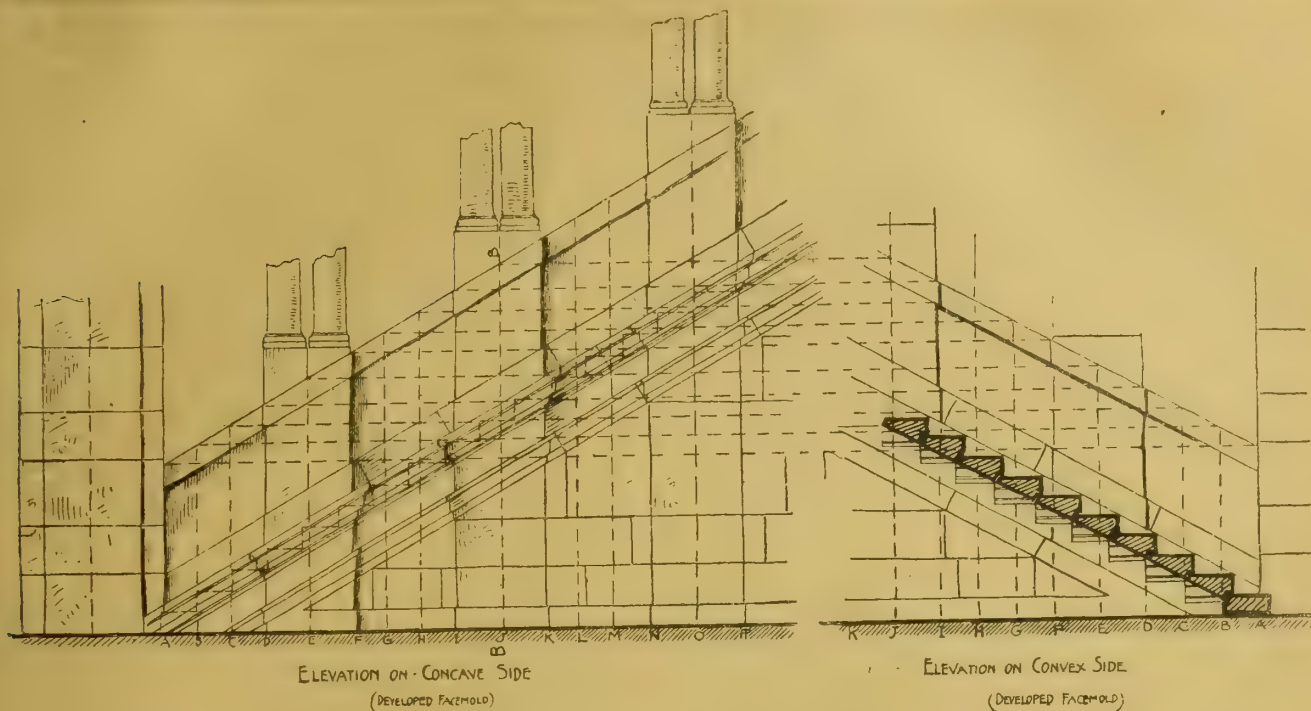
AT the fortnightly meeting of the Architectural Association held on Friday evening, the President, Mr. W. D. Caröe, M.A., F.S.A., in the chair, a lecture was given on "Masonry" by Mr. Hervey Flint, the teacher in this subject at the Battersea Polytechnic and the Carpenters' Company's Technical Schools, Great Titchfield-street, W. The paper was illustrated by numerous full-scale diagrams, some of which are reproduced herewith, by models executed in clunch stone in the author's classes, and by a large collection of photographs and specimens of choice figured marbles, serpentines, and porphyries, and also granites, limestones, and freestones lent by Messrs. Farmer and Brindley, of Westminster Bridge-road, S.E.

Our first consideration in the erection of our buildings is, said Mr. Flint in his introductory remarks, that they shall combine beauty of design with stability and utility. The item that the mason is called upon to assist you in is stability. Stability should be the aim of the architect; but in stonework, is this always attained? We have had, during the last few years, splendid buildings erected; but after a winter or two we find the stone decaying, sometimes even

members of a cornice, for instance, disappearing altogether—weathered away. What is the reason? Is it that we have no stone to stand the weather? I say no; but I do say that enough consideration is not given to the selection of a suitable stone for building purposes. With a thorough appreciation of artistic tastes, love of colour, and fascinating details, I ask you to take a lesson by what has gone before, in the shape of building-stones. Take that noble pile, the Houses of Parliament. Here was a commission of inquiry appointed of the most scientific men of the day, whose business should be to determine the most suitable and proper stone for that gigantic building. What was the result? Why, after travelling all over England, it was found that the stone from the Church Anston and Bolsover Moor quarries possessed all the qualities required by science to form a good building stone; and, further, that the old minster of Southwell, in the immediate neighbourhood, dating back to the Norman period, was built of this stone, the mouldings and chisel marks being in almost a perfect state. It was also shown that the quarries possessed enough stone to complete the work, which was, of course, in itself a great factor. You all know the one great mistake that was made: the atmospheric influences of the Metro-

polis, compared with Mansfield or Anston, are of a totally different character; and selecting a stone from Southwell is one thing, and doing the same for smoky, sulphurous London another. Hence the continual restoration that goes on on a building that should have proved an architectural bulwark of the nation. It is a great mistake to take only the state of buildings in the neighbourhood of quarries when selecting stone for a different part of the country, the climatic changes in the atmosphere being quite adverse the one to the other. Our first building material undoubtedly is granite. It is practically imperishable, as evinced by our own Cleopatra's Needle, Waterloo Bridge, built in 1817, Duke of York's Column, 1830. The success of granite as a building material is when it is polished. If all our buildings were of polished granite, what a change from our dirty grimy streets; but like all other building materials granite requires attention in the shape of cleaning. Marble as an external building material has not proved a very great success, but, with care, marble can be selected to assist you when you require colour, such as panels, &c. The new balustrade round the Athenæum Club is a fair specimen of this kind of work, and has proved a success. Let us deal next with the general building stones. The one





standing out in the most predominant manner is that from the Isle of Portland. As an exterior building-stone it has proved itself more than capable to cope with the influences of our climate. Since the time of the Great Fire of London in 1666 Portland stone has been the staple material for building purposes, and it is noteworthy to mention that only one other stone, and that Roche Abbey, was mentioned by Sir Christopher Wren, as an alternative to Portland stone, for the

material he wished to use in the construction of his masterpiece, St. Paul's Cathedral. The two beds of Portland stone that we are mostly associated with are the Whitbed and the Basebed. The former is by far the most durable for exterior work, and is commonly called Brown Portland. Portland stone is an oolitic, calcareous freestone, its particles resembling the small eggs or roe of fish (hence the word "oolitic," meaning egg-stone). These formations, when the stone is

broken, can readily be distinguished by the aid of a magnifying-glass—in fact, often by the naked eye. In selecting a good lasting stone these particles should be well defined; the cementing properties between each particle should be very clean; there should be no powdery or earthy matter. Generally speaking, good and bad stone in Portland may easily be distinguished by the sound of a block. If it is slung up clear in its own weight, and a sharp blow be given by



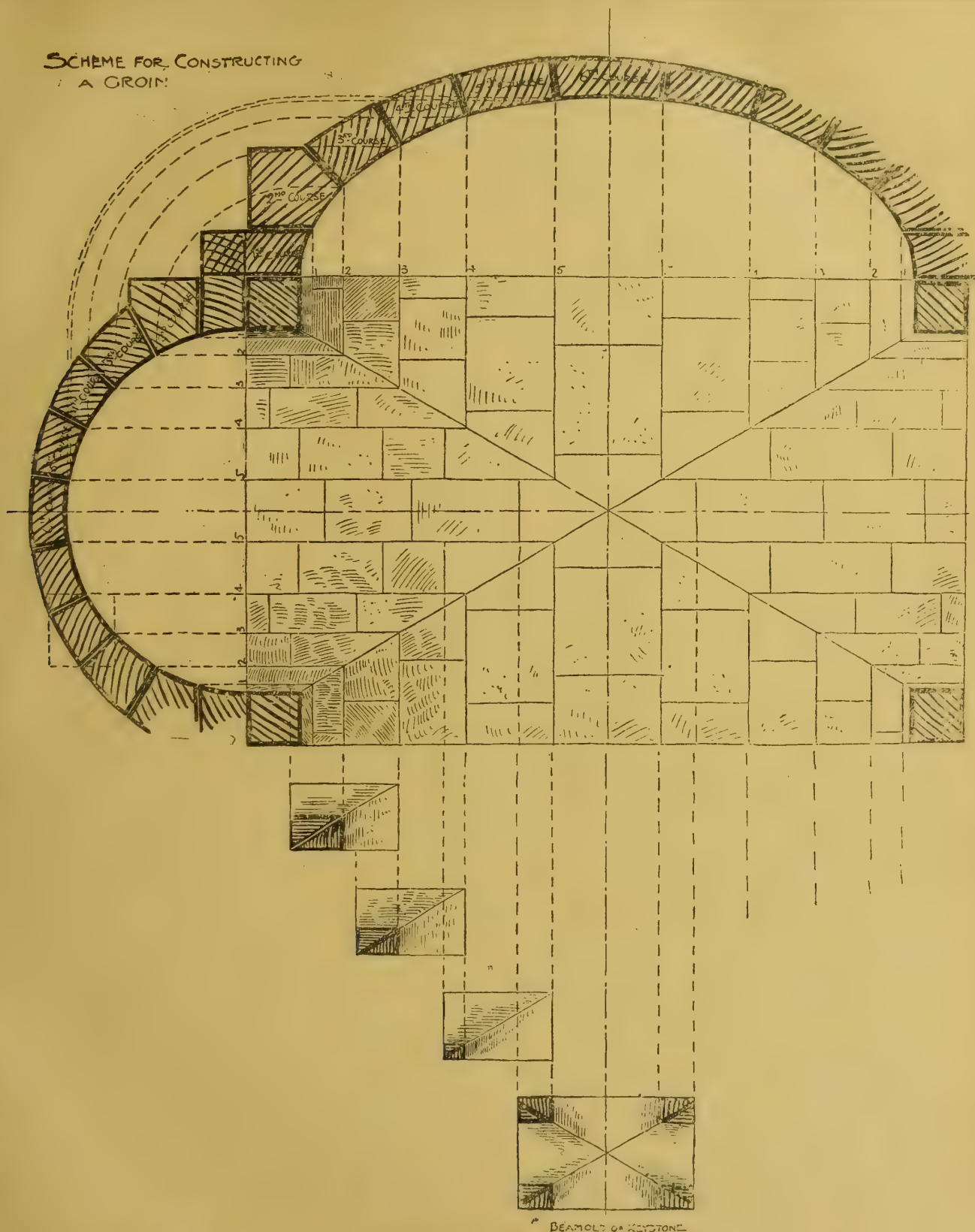
any hard material, the sound should be clear and crisp. If in selecting stone this result is obtained, one may invariably depend, not only on having obtained a lasting stone, but one that will turn out, in the old stereotyped quantities' phrase, "free from all flaws, shakes, and other defects." But if you should get a stone that sounds dull and stifled, then one can rest assured that it contains either one or other of the defects that we are anxious to obviate. Let us turn to Basebed Portland, commonly known in the trade as Bestbed. This is not easily distinguished from Whitbed, the colour and general appearance of the two being almost identical; but if you call in the aid of a glass, you will at once see that it is more uniform in structure, and has less of the shelly matter; consequently it is more difficult to say which is its natural bed, as its oolitic formation is scarcely observable. Basebed Portland is an excellent stone for sheltered positions, as it can be worked up into fine detail and to a fine finish, and also at a less cost than Whitbed; but for exposed positions it should not be tolerated. A third class of Portland stone is what is known as the Old Purbeck Portland. It comes from Swanage, Dorsetshire. This stone was much sought after in olden times, being very superior and durable. It is specially adapted for such work as staircases, pavements, &c., as it is of a very tough nature. The Law Life Assurance Office, 187, Fleet-street, was built of this material in 1854. The balustrade round two sides of the Athenæum Club, with panels of Irish-green marble, is also out of this stone. Ketton stone is one of the best weather-stones we have, but is one that is rather neglected by the architect. The oolitic formation of this stone is very perceptible. We have examples of it at St. Dunstan's Church, Fleet-street, and St. Pancras Station; and I was much impressed recently on a visit to the Jews' Cemetery at Willesden by a large balustrade, full of good detail, round Baron Rothschild's inclosure. It has been standing some twenty-five years, and is in a perfect condition; the carvings and arisings are as sharp as when executed. The labour to Ketton stone is rather less than to Basebed Portland. I would strongly commend this stone, as it combines the essentials of durability with a nice warm colour. The softer freestones, such as Monks Park, Ham Hill, Box Ground, Corsham Down, Stoke Ground, and others, should especially be subjected to the seasoning process. Doubling stone is one of the best of the softer stones for weather purposes, but it will not take small detail, being of a very coarse nature. All stone should be clean in appearance, and should lay on its natural bed. Columns or pilasters, for instance, that have any weight to carry should be in courses. If built in one, "end on," to use a general phrase, the bed lines should be as nearly as possible perpendicular. If otherwise, the stone has a tendency to split with the weight. Especially should the stone be of a very laminated quality, such as Corsehill, Ham Hill, and the like. All faces should be accurately true, beds perfectly square from the face and worked free from holes; every hole below the general surface of the bed lessens its crushing weight. It is far better in a large bed of a pier-stone, for instance, that it should be inclined to roundness rather than to hollow; hollow beds throw all the superincumbent weight on the outer edges, and will consequently cause fractures on the faces. I would suggest that all stonework be left from the chisel and not "rubbed." A chiselled face, properly executed, is far preferable to that rubbed with coarse sand, which leaves all the pores of the stone open. If a stone is roughly chiselled with a dull tool—viz., a blunt chisel—the face is not cut but literally stunned off; if added to this it be rubbed with coarse sand, that stone will for a certainty weather in considerably less time than if it had been chiselled; and when I say chiselled, I mean cleanly cut with a sharp tool. Then, should you prefer it rubbed to a face, let it be so; but use fine sand, so that the face will be left to a fineness that will close the pores, and as this fine face quickly hardens, on no consideration should it be disturbed. Speaking of chiselled faces, I would say that the old Saxon walls brought to light in the crypt of York Minster retain the tool-marks, which are almost as sharp as when first cut, and it is very interesting to trace the individuality of the workman by those chisel marks. In this work you can also trace the mason's marks, clearly indicated, not on the beds, as is usual now, but on the exposed faces; a treatment that would hardly find favour with the architect of

the present day. I have made a small collection of "banker-marks," the forms of which are singular. Soft oolitic freestones should be finished with a fine face and not left from the coarse drag, as is very general, but which has the same effect as coarse sand has upon the harder materials. The art of building in stonework is that every stone has a purpose to perform, a weight to carry; therefore, avoid all sham jointing. The more joints the better, and the less liability to fracture, should any settlement occur. That this is the case is shown by many of the long stones in the window-heads of our buildings, which are often in one length, a large proportion of which is broken. This would not be so if these heads were jointed with splayed joints. Vertical joints, in any head spanning a clear opening, are quite out of order, and should not be permitted, being contrary to all rules of masonry. In building, work should be so arranged that each stone should take its equal share of the weight to be carried. This can only be obtained by the work being properly coursed. "Jumps" should be avoided—all beds should be level. I know of no greater weakness, constructionally, than notched beds. Take the springers to a groined ceiling. These are generally worked with a horizontal bed up to such a height as to where the ribs clear themselves one from the other. Sometimes we find them drawn with radiating beds all through. This is a mistake, for in this case you are apt to get a continuity of sunk and notched beds, and the whole weight of the ceiling being distributed over the ribs on to the springers, consequently the greatest strain is at that point. It therefore goes without saying that at that point there should be nothing but strength. I exhibit a couple of models of vaulting work executed by two of my students at the Carpenters' Company's Trades Training School, Great Titchfield-street, W. The fan vault is a model of a section of the cloisters at Gloucester Cathedral. They are coursed with horizontal beds, and are fair specimens of what can be attained in masonry. Walls made out with brickwork or concrete should be brought up course by course; the stone should be well bonded, the greater the number of thorough bonds the better. The filling-in material should be strictly level, so that the succeeding courses may take a perfectly true bearing right through, not more on the stone facing than on the wall filling in. Each stone should be well bedded in an admixture of lime putty, gauged up in the proportion of three parts stone dust to one of lime, adding one quart of liquid Portland cement to every hundredweight of putty. All joints should be joggled and dowelled with square slate dowels. Pebbles are often used for economy, but being round they lose a great deal of the resisting power that the square dowel retains. Each joint, to make good work, must be run with cement and clean sharp sand, the stones being previously well saturated with water, or the dry stone will absorb all the moisture from the cement, leaving the "grouting-in" material in quite a powder and consequently useless condition. All stone, to make satisfactory fixing, must be well saturated. Stone fixed in positions requiring great strength should be well cramped or dowelled together with copper or slate dowels. These dowels should be slightly dovetailed; if overdone it is conducive to weakness rather than strength. Avoid iron in fixing. Portland cement and iron work well together; but really for cramping, or such work as that, iron has no recommendation; for look at the Banqueting Hall, Whitehall, or the Horse Guards' Barracks at the same place. If you will examine the large fractures in the faces of the stonework in those buildings you will have no difficulty in satisfying yourselves that the factor is the iron cramp. Now, when we come to interior work, a new field is open to us. We are not bound by influences such as those that have been under our consideration. What points we have to consider are, primarily, strength of material for its purpose; secondly, its adaptability; thirdly, and generally to the client the most important, its appearance when finished. With all due respect to your President's opinions, I, if I followed my own inclinations, should give marble the premier place as an internal material. Doubtless a number would say that marble is out of the question for general purposes, its cost is so great; but marble does not in itself ask for a treatment such as you give to stone. Work executed in marble can and should be finished so as not to have any appearance of grime or even of dinginess. Marble should not be looked upon as a constructional but rather as a decorative material,

and looking at its use from a monetary point of view, I would quote Mr. W. Brindley's paper before the Royal Institute of British Architects some two or three years back, where he tells us that, "at St. Sophia 2,000ft. super. of delightful decoration of a durable character was cut out of a single block of Cippolino marble, the whole opened out and making a continuous pattern." Then, again, to adapt marble to concave or convex surfaces, I would ask you to visit the church lately erected by Dr. Freshfield at Lower Kingswood. You will find that we have followed out the scheme of the Byzantines—viz., forming the convex face of the apse with a series of narrow slabs opened out chevron fashion, this producing quite a curtain-like appearance, which has a very pleasing effect. To save work such as this—in fact, all slab work—from having the appearance we find in some churches, and what your President rightly deprecates, several things have to be considered; for instance, if the walls are built of mortar, the sand of which is Thames sand, so called—but if that sand comes from the mouth of the Thames, that constitutes sea sand—consequently you will get that dampness and efflorescence that is usual with that kind of mortar, for the walls being "cased" with marble the salt naturally finds its way through. Marble should never be fixed solidly to the wall, but left hollow, and also with a joint here and there left open to allow for the condensation that invariably takes place. The work should be well cramped to the wall with copper cramps. The best of plaster should be used in fixing, and I have no hesitation in saying that if slab-work is fixed under these conditions, and with a care in selecting suitable marbles, you will get satisfactory work, as shown by the slab-work at the vestibule of the Athenæum Club, the National Gallery, and other places. These buildings were all in a proper state to receive marble. Then, again, as to keeping the work clean after it is fixed. All that is required is proper attention with dry dusters. Marble work should never be washed down as you would wash tiles. The dust that clings to anything damp, if rubbed constantly on the polished surface, is literally ground into the face of the marble. This applies more especially to the light marbles. But if a perfectly dry duster is given to your work, the result will be satisfactory. These may seem very ordinary remarks, and may weary you, but they are of great importance if you want satisfactory results. The mason is a methodical man. If he works a moulding—say a cornice, for instance, or a string mould—he would proceed by applying his section to chamfers, and then working his chamfers through. Now in designing your mouldings, this should be taken into consideration, as moulding drawn to suit the method of working seems to be only right, and in support of this I would ask you to examine the old specimens that are here, and also to look at the diagram. Work drawn on these lines, especially in marble, lessens the cost of labour considerably, the mason being able to get at it much better than if at the outset you upset his method of working. You will also observe that marble moulding drawn on these lines can be got out of slabs, and made out with a core of stone, thus giving you in effect solid cornices, &c. In drawing your sections for marble, it is very essential that you should have a knowledge of the material and its capabilities of receiving mouldings. The composition of the various kinds varies to such an extent that a moulding that could be worked in one marble would be quite out of the question in another. For instance, take a chimney-piece in statuary or Pavanaazza, and then one in Cippolino or Rouge Etrusque. What could be produced in the former materials would be quite out of the question in the latter. Speaking generally, the rich coloured marbles do not ask for an elaborate treatment in the way of mouldings; in fact, the different colours, lines, and markings of the material are very apt to upset the arrangement of mouldings unless they are treated in a broad manner. The use of machinery has considerably reduced the cost of marble work in England during the last few years, and has also lessened the time taken in production. The use of marble by the architects during this revival has been very great, and I believe will be greater in the future, when its adaptabilities are more widely and better known. Alabaster is the intermediate material, as regards cost, between marble and stone, and lends itself admirably to use with either of these materials. It is non-absorbent, and retains its polish in dry positions. Most of the monuments in and since the



# SCHEME FOR CONSTRUCTING A GROIN



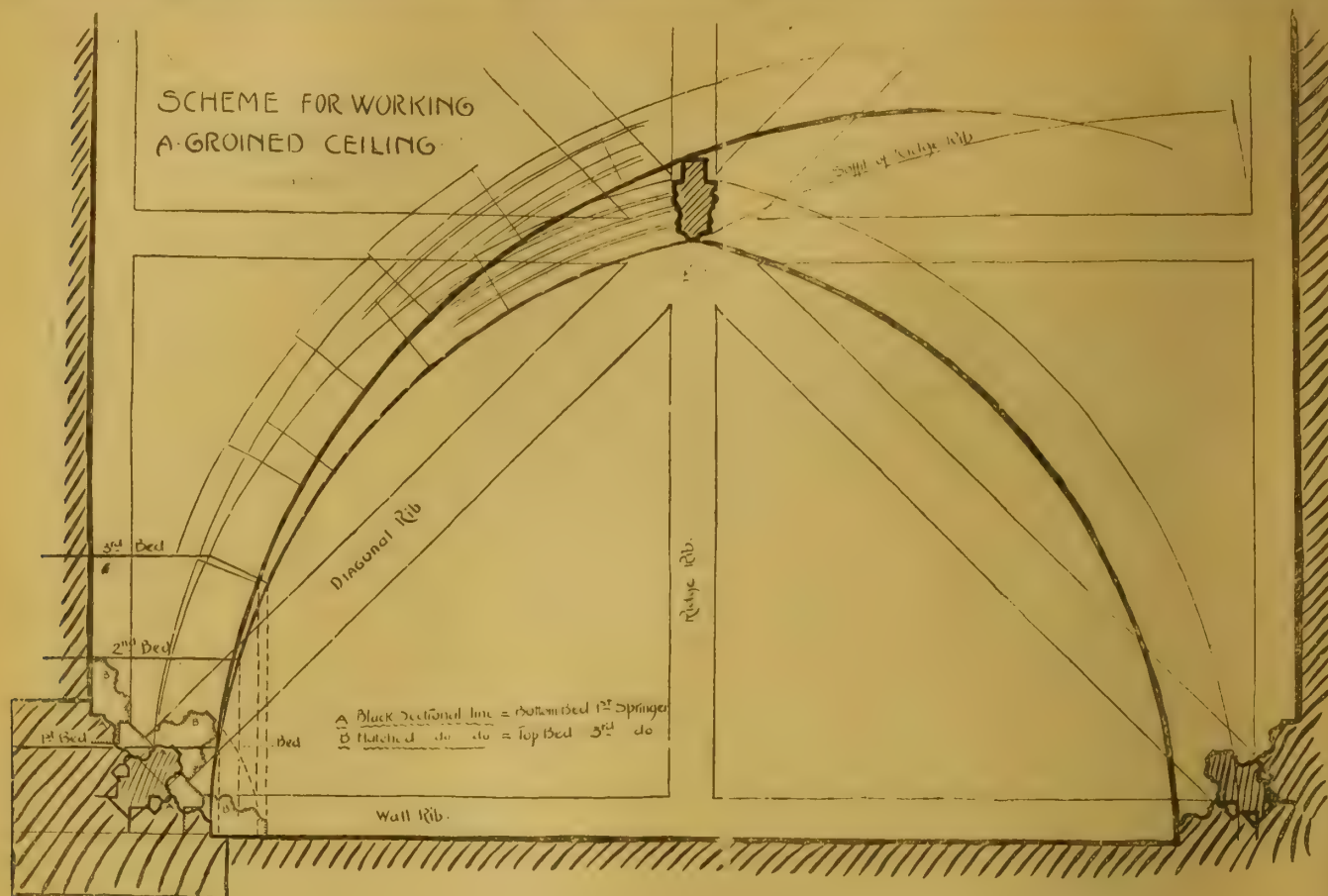
BEAMOLD OF KEYSTONE

Elizabethan period have been executed in alabaster, with panels, &c., of choice coloured marbles. It is specially adapted to ecclesiastical work, such as reredoses, fonts, pulpits, and screens, as it is capable of taking any amount of detail, and, if properly selected, is of a very quiet and subdued colour. We are now able to obtain very large blocks of alabaster of a soft white tone, so that it is now within the reach of most architects to introduce work, such as sculpture, that could only be obtained a short time since in statuary marble. White alabaster is a good and successful substitute for statuary marble when it is a question of cost. Some alabaster being of a semi-transparent nature is, therefore, very suitable for glazing purposes where a quiet and subdued light is desired. Both in marble and alabaster mouldings it is never desirable to have them highly polished, as it produces lights

and shades that have a great tendency to destroy the effect you had intended to produce when you designed your sections. Rather have mouldings polished to the extent of an eggshell, which gives an appearance of solidity to your work. Coming next to consider stones for internal building, we have a very open field of selection. Basebed Portland is about the strongest, and can be worked up to a fineness; but its colour is not as nice and as preferable to some of the softer stones, such as Painswick, Ancaster, Caen, Tottenhoe clunch, and many others. Painswick stone is of a very fine and even grain, and is very suitable for balustrades, groinings, arches, staircases, &c.; and, speaking of staircases, I would ask you to examine my diagram and the models sent by the students at Great Titchfield-street, and the larger one, circular on plan, from the Battersea Polytechnic. These are worked

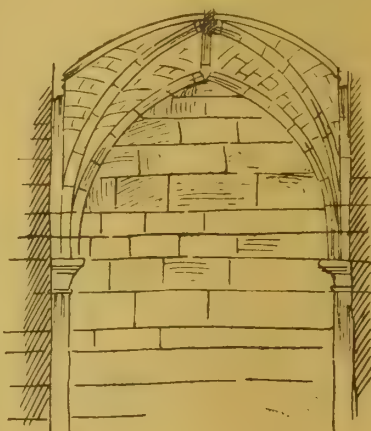
out on an economical principle—viz., using the least possible material to produce the greatest amount of work. If you follow the diagram, you will see that each stone is worked at the first onset to its required pitch, and not in the old-fashioned way—that is, out of square pieces. Take the handrail, for example. This would be produced from a slab slightly in excess of its finished thickness. This is, as you will see, a tremendous saving, especially when one is using such costly materials as those in the staircase at the National Liberal Club, which was erected by Messrs. Farmer and Brindley, from the design of Mr. Alfred Waterhouse, R.A. This work was prepared by this system, and, being elliptical on plan, stands unique so far as England is concerned. As an internal building stone, I would call your attention to the specimens of Tottenhoe clunch stone, in which nearly all the models exhibited





this evening were worked. A very elaborate monument in York Minster of this stone has been recently erected, from the designs of Messrs. Bodley and Garner. The tone of this stone is of a greenish white; it was much used in Hertfordshire, Bedfordshire, and adjoining counties. The high altar and most of the monuments in St. Alban's Abbey are of this stone. It can be worked to the fineness of chalk, which speaks volumes for its adaptability for sculptures, carvings, and the finer traceried canopies we love to gaze upon in Henry VII.'s Chapel at Westminster, or the web-like ceiling of that building, itself a complete masterpiece, or the splendid fan ceilings of the Lady Chapel at Peterborough, or the cloisters at Gloucester—the last named being, I believe, the first fan-vault ever erected. I think I am right when I say that this system of vaulting was the outcome of the old guild or school of masonry which was established at that place, and it seems to me extremely interesting, at a time when our old apprenticeship system has almost become a thing of the past, and when the outlook of masonry, as its sequence, is anything but encouraging. I must say I feel honoured by being allowed to conduct the classes for the technical and practical improvement of the masons carried on at Great Titchfield-street by the Worshipful Company of Carpenters, and also at the Polytechnic at Battersea, and to be able to bring down to you to-night a model of the vaulting I have endeavoured to associate with the Mason Guild. I believe that if we are to uphold our old reputation as craftsmen, this technical education is the only substitute to find for the old time-honoured apprenticeship. The masons' trade, to reclaim its old prestige, which was at its height in the Mediaeval ages, would do well to reform or reorganise its old guild, which insisted on good and sound work, providing and sustaining the young craftsman during his education in the trade—in other words, during his apprenticeship—and finally assisting him to become a workman worthy of the great works they were at that time carrying out in our cathedrals—works which we of the present day look to for inspiration. If this guild were reorganised, I would suggest that before a youth should be allowed to dub himself a mason he should undergo an examination, and thus claim his right to call himself really a master-mason. I believe that such work as this was carried out by the Masons' Company at the time when they

really showed that they actually lived. To me it is a matter of regret that as a trade we are to a certain degree dependent on another company and other institutions to provide that learning and that tuition that is so necessary to uphold our ancient craft. It must occur to you that the mason should have a fair knowledge of drawing, and if we are to carry out work to compare with our old examples, something must be done to educate the



Rough Sketch of Ceiling

mason; and I am glad to say that, through the generosity of the Carpenters' Company, we have made a fair start. These institutions are welcomed by the workman, and I look forward to the time when we shall have the co-operation of your Association. Our doors at both Great Titchfield-street and at Battersea are thrown open to your students, and we shall welcome any who will come and give us the advantage of their capabilities in design and detail. In return we offer you a sound course of practical instruction, instruction that we feel is highly necessary for the welfare of the architecture of the future. I myself am of opinion that as it is requisite in the

erection of an edifice for the builder to know and understand the drawings delivered to him for that edifice, so is it necessary for the architect to know and understand the nature and properties of the materials specified by him for that edifice; and I hold that it would also be to the advantage of all concerned if he had a practical knowledge of the adaptabilities of the materials for the work designed. This knowledge can only be obtained by a course through the workshops, and I ask you, the younger students especially, you that have everything before you, you that are the anxious hope of many a fond parent, to come and take of that knowledge we feel is so important to enable you to carry on your splendid profession successfully.

Professor BANISTER FLETCHER, J.P., in proposing a vote of thanks to the lecturer, said there was no question about one thing, that there was an increasing conviction that there ought to be a closer connection between the architect and the craftsman, and this was being supplied in the classrooms at Great Titchfield-street. During his visits to that institution he had been struck with the fact that the architect, with his educated eye, seemed to learn far more readily and quickly than the practical craftsman. He believed that by means of these classes the architect might soon recover lost ground, and learn the practical part of his profession.

Mr. BARNES, in seconding the motion, said he could not quite concur with Mr. Flint in giving a first place structurally to polished granite. As regards durability, it doubtless stood foremost; but it was too hard and intractable a material, and would not lend itself to the finer forms of architecture. A few white marbles would stand the English climate; but marble should never be placed on a wall or as a pavement where the substructure was not perfectly dry. The lecturer had not alluded to one very durable stone which was not largely used in London, although frequently employed in the North of England; he referred to Bolton Wood stone, with which the Town Hall of Bradford was built twenty-five years ago, and was free from any signs of decay. Taking all things into consideration, Portland stone was the most reliable stone for London use.

The PRESIDENT corrected one mistake by the lecturer, who had said that their chairman did not approve of marble; but he only objected to its use out of doors, and was at the present time finishing two buildings which were entirely lined



with marble internally. The question of wide & narrow joints was an interesting one. If a stone were polished on the bed, the joints ought to be as close as possible; but were this not the case, a bed between the stone was of the greatest importance. The fault in the Anston stone used in the Houses of Parliament was not so much in the material itself as in the fact that the stone was used indiscriminately, and was sent up without any inspection. Granite, again, was by no means imperishable, unless it was carefully selected, and there were granites to be found in both Cornwall and Ireland which would not stand the weather.

Mr. FLINT replied, stating that he advocated an open  $\frac{1}{4}$  in. joint in every case. The beauty of vaulting was its jointing, and the openings between the stones should therefore be kept clear and be easily seen.

#### NOTES ON DOMESTIC DRAINAGE.—VI.

##### JOINTS OF DRAIN-PIPES.

THE efficiency of a pipe drain depends in a great measure on the character of the joint between the pipes. The whole of the joints when made must be perfectly air and water-tight. The adjacent pipes should be concentric with each other, and the bore of the drain quite even and smooth at the joints.

The joints of cast-iron drain-pipes should be

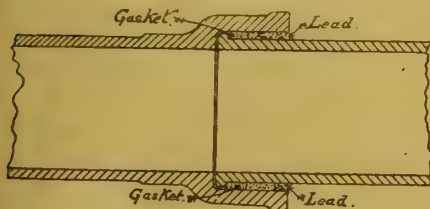


FIG. 11.

run with molten lead. To make the joint a few gaskets of spun yarn are first driven in and well caulked. A band of well tempered clay is then placed round the socket, leaving the interior clear to receive the lead. An opening is left in the clay at the top, through which the molten lead is poured. When the lead is cold the clay is removed and the joint caulked with a caulking tool. A section through the joint of a cast-iron drain-pipe as ordinarily adopted is shown in Fig. 11. Sometimes a tight-fitting turned and bored joint

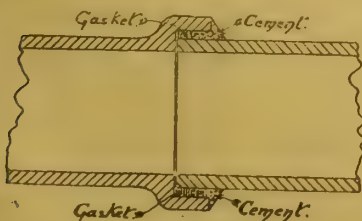


FIG. 12.

is used to obtain better concentricity, the joint being then run with lead and caulked in the usual manner.

The jointing of stoneware pipes is a much more difficult matter to accomplish satisfactorily than in the case of cast-iron pipes. To overcome the difficulty numerous forms of joint and jointing material have been devised. Fig. 12 is a section of the common spigot and socket joint. The joint is generally made with cement only; but a better way is to force some gaskets of yarn into the socket before jointing with cement. This prevents any portion of the cement protruding inside the pipe, and also more readily insures the concentricity of the pipe.

The use of clay as a jointing material should not be allowed, owing to its solubility when in contact with running liquids. Neat Portland cement of good quality should be used, and it is advisable to confine the use of the ordinary spigot and socket joint to storm-water drains only.

A simple and good form of joint for stoneware pipes is shown at Fig. 13. It is called the "double seal" joint. A fillet of bituminous material (consisting of tar, sulphur, and ground pipe) is accurately cast on a portion of each spigot and socket, so that when two pipes are

pressed together, a perfectly water-tight and concentric joint is obtained. Before jointing, the surface of the fillet must be smeared over with a mixture of 2 parts of tallow to 1 part of resin, which has been previously melted together. The remaining portion of the socket is filled with cement, the socket being undercut to afford a better hold for the cement. By this means the extra security given by two distinct jointing materials is obtained. A form of joint very

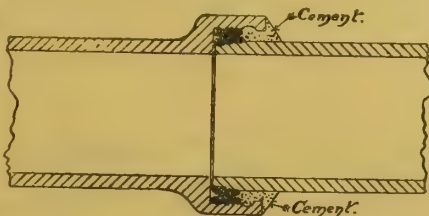


FIG. 13.

similar to this is known as the "composite" joint.

"Hassall's patent double-lined joint" is another form that may be used with advantage (see Fig. 14). This consists of two fillets of bituminous material cast on each spigot and socket. When put together a central hollow space completely encircles the joint, which is filled with liquid cement poured through a hole provided at the top of the socket for that purpose. An impervious band of cement is thus obtained round the centre of each joint.

In addition to those mentioned, there are numerous other varieties of joint for stoneware pipes in the market; but space will not allow of any further reference to them.

##### LAYING DRAINS.

To insure the pipes being laid straight and true in gradient, it is necessary to erect "sight-rails" along the line of the drain. Each sight-rail consists of two stout wooden uprights having a horizontal wooden rail well secured to them. The uprights are firmly planted in the ground at a sufficient distance on each side of the trench to be unaffected in any way by the excavations. The horizontal rail must be perfectly straight on its upper edge, and of sufficient depth and substance to avoid "sagging" when fixed. A "boning staff" of suitable length must also be provided for use with the sight-rails. This is made in the shape of an ordinary T-square having a stout wooden shaft with a cross head attached. The boning staff is used when the pipes are being laid, so that the invert of the drain may be parallel to the line of sight between the sight-rails.

Care must be taken to fix the sight-rails at

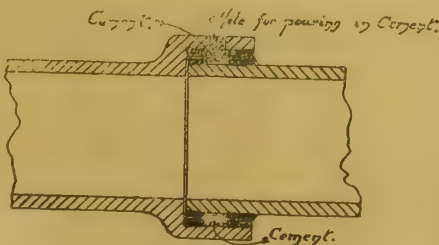


FIG. 14.

their proper relative levels. Having ascertained the reduced levels of the surface of the ground, and also those of the invert of the drain with respect to the Ordnance datum at the points immediately below the position of the proposed sight-rails, the sight-rails should be so fixed that

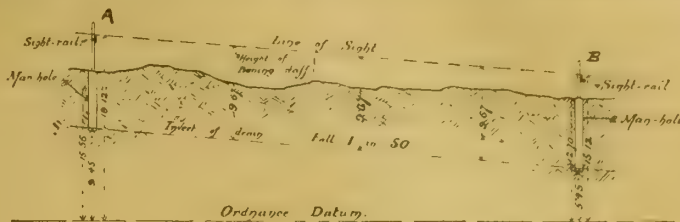


FIG. 15.

the difference of level between the two rails is exactly the same as the difference of level required between the invert of the drain at the points immediately below the sight-rails. In other words, the sight-rails are fixed at such relative levels that the "line of sight" between them is parallel to the invert of the drain. The boning-staff must be of the same length as the distance between the sight-rail and the invert of the pipe immediately below it.

Fig. 15 shows the sight-rails fixed ready for use. In this instance the reduced levels invert of the drain, and the ground level immediately below the sight-rail A, are assumed to be 9.45ft. and 15.56ft. respectively. The levels below the sight-rail B are 5.45ft. and 12.70ft. The rail A is proposed to be fixed 19.12ft. above datum. The invert of the drain having a difference of level between the sight-rails of 4ft. (9.45 - 5.45), it will consequently be necessary to fix the rail B at a height of 15.12ft. above datum, in order that the line of sight may be parallel to the invert of the drain. The length of the boning-staff for use in this case will be 9.67ft., and the level of the invert of the drain at any point between the sight-rails can be readily ascertained by holding the boning-staff vertically at that point. When the head of the boning staff coincides with the line of sight between the sight rails, then the exact level of the invert of the drain will be indicated by the foot of the boning-staff.

The trench should be excavated in a perfectly straight line to the necessary depth, the bottom being well rammed and levelled to the required gradient. It is desirable to lay all foul-water drains on a bed of concrete. Where the ground is

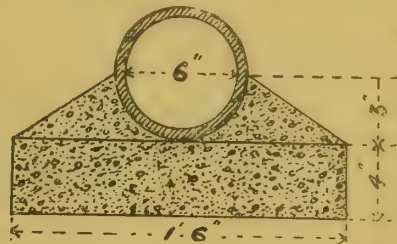


FIG. 16.

ordinarily firm and solid, the thickness of the concrete bed need only be about 4in.; but in situations where the ground is of a loose, wet, or marshy description, then the concrete bed should have a minimum thickness of 6in. For storm-water drains the concrete bed may be omitted where the ground is fairly sound and firm.

When drains are being laid without a concrete bed, care should be taken that the trenches are not made deeper than absolutely required. Where the excavations have been made too deep, and the bottom of the trench requires to be made up in places, concrete should be used, for if made up with rammed earth, settlements of the drain-pipes frequently occur at such points after the trenches are filled in and the ground has become consolidated.

The bottom of the trench should be well rammed to receive the concrete bed. The concrete should be 12in. wider than the bore of the pipe, and the surface accurately brought up to the required gradient. Wooden moulds about 5in. wide, 2in. deep, and of a length equal to the width of the concrete should be inserted in the concrete bed, and spaced 2ft. apart, centre to centre. These moulds are removed when the pipes are being laid, so that a depression is formed in the concrete sufficiently wide and deep to admit of the pipes being readily inserted and jointed on the under side, whilst the barrel of the pipe rests solidly on the concrete bed itself.

After the whole length of drain has been laid and tested, the sides of the pipes should be



haunched up with concrete to a height of half the diameter of the pipe, as shown in the following sketch (Fig. 16).

This additional packing of concrete at the sides greatly supports and strengthens the drain, and at the same time forms an additional safeguard to the joints of the pipe.

Where no concrete bed is provided, slight sinkings should be cut across the trench to allow for the sockets, so that the barrel of the pipes may lie solid on the bottom of the trench. In all cases, care should be taken that the socket of each pipe is laid towards the head of the drain.

When the pipes have been satisfactorily laid and tested, the earth should be very carefully filled in over the pipes at first, and gently battened down with the spade. All large stones should be

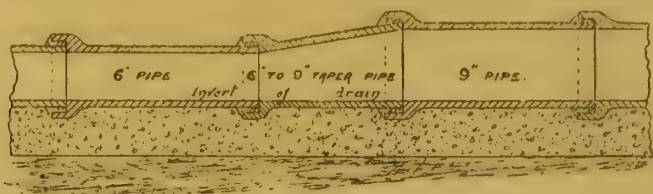


Fig. 17.

removed from the preliminary earth filling, and ramming should not be allowed until at least 2ft. of earth has been placed over the pipes.

Should it be necessary to lay a drain near the walls of a building (more especially if the building contains a basement), the drain must be entirely incased in concrete not less than 6in. thick, so that no sewage from any defective joints or pipes may percolate through the foundations or walls to the interior of the building.

Unless absolutely unavoidable, drains should never pass under a building. If, however, there be no other alternative, then the drain should be constructed with stout cast-iron pipes, coated with some preservative, and the joints run with lead and caulked. The pipes should be laid within a well-constructed culvert, so arranged as to be open to the air at both ends. This can usually be effected by forming a proper ventilated inspection-chamber at each end of the culvert. Instead of the pipes resting on the bottom of the culvert, they may be laid on tee-iron bearers, built into the sides of the brickwork so as to raise them about 9in. from the bottom. Every portion of the drain is then accessible throughout its length, and sufficient space left all round to allow of the pipes and joints being thoroughly examined at any time. Where the drain passes under an unimportant or detached outbuilding it will be sufficient to surround the pipe with 6in. of concrete.

Relieving arches in cement should be turned over all drains passing through walls to prevent a possible settlement of the wall damaging the drain.

At those points where it becomes necessary to increase the size of the drain, the enlargement should be made by means of proper taper pipes or channels, the invert of the drain being laid at the same gradient throughout. When the enlargement does not occur in an inspection-chamber, it should be made as shown in Fig. 17.

#### VALUATIONS AND APPRAISEMENTS.

MR. A. J. RAM, Recorder of Hanley, read a paper at the Auctioneers' Institute, Chancery-lane, on Friday night, on "Valuations and Appraisements." Mr. Frank Everill, of Worcester, the president, occupied the chair. Mr. Ram stated that valuations divided themselves into two classes. To the first belonged valuations of crops, improvements, &c., as between landlord and tenant, and valuations of properties and businesses as between vendors and purchasers. The other class comprised valuations made for the purposes of loans. He advised his audience to see to it that in every case in which their services were sought as valuers of crops, timber, &c., their duties were unmistakably prescribed in writing. They should require that those who sought their aid should say plainly whether they were employed as valuers of a price to be paid in order to avoid differences, or whether they were employed as arbitrators to decide differences, or, after hearing, to judicially determine what should be given. In dealing with the second part of his

subject—viz., valuations made for the purposes of loans, Mr. Ram said the law in respect to such matters had, within the last few years, undergone considerable alteration, and the alteration affected both a class of those who employed surveyors and valuers and those employed to survey and value. An Act was passed in 1893, and one of the present conditions was that in the case of loans by trustees the loan must be made on the advice of the surveyor or valuer expressed in his report. This was an onerous condition. At the present time it did not matter whether a local surveyor valued the property or not, so long as the surveyor was a competent man. He, however, ventured to say that a surveyor who was called upon to value property which either possessed local characteristics, or which was

remote from localities with which he was familiar, would, in his judgment, act wisely if he were to stipulate that some qualified gentleman possessing local knowledge should be associated with him in the survey or valuation.

#### THE NORTHAMPTON POLYTECHNIC INSTITUTE, CLERKENWELL.

THE members of the Architectural Association visited, on Saturday afternoon, the new Northampton Polytechnic Institute, now in course of erection at Clerkenwell, from plans by Mr. E. W. Mountford, F.R.I.B.A., selected in competition (see illustrations in our issue of April 21, 1893). The visitors were received in the great hall by Mr. Mountford, who exhibited and explained the plans and drawings, and afterwards conducted the party over the buildings, pointing out the salient features. The scheme is being carried out by a committee representing the City of London College and the Birkbeck Institute, as well as the Charity Commissioners; the site, the whole of which has not yet been handed over, is an isolated triangular area, bounded by St. John's Street-road, Lower Charles-street, and Ashley-street; the main buildings are now being roofed-in. The contractor is Mr. Walter Wallis, of Ramsden-road, Bulham, and the clerk of works is Mr. Isaac Gard. The outlay will be about £70,000, exclusive of the excellent site, which has been given by the Marquis of Northampton. The style adopted is Free Renaissance, very plainly treated, the details, especially in the internal woodwork and fittings, being kept studiously simple. The facing materials are red Ipswich bricks, with bands and dressings of Monks Park Bath stone, the roofs being covered with green Westmoreland bricks. The buildings form a triangle, with a central courtyard and staircases at the outer angles. The principal feature of the block is the great assembly hall; this is 100ft. by 67ft., and 50ft. in height from floor to barrel-vaulted ceiling. This hall occupies the upper portion of the St. John's Street-road frontage, and accentuating the main entrance on this façade between the hall and the adjoining workshops is a plain square tower rising a little above the height of main roof, and finished with a circular domed roof of copper; from the belfry level of this tower a wooden bracket, carrying a large clock, projects over the street, and the upper stage will be fitted up as an observatory. The great hall is surrounded on three sides by a deep gallery, supported on iron columns, and at the farther end is a large stage, with recess for organ above. The ceiling is divided into five bays by broad flat ribs, and these have been treated in plaster by Mr. Seale, of Camberwell, from the architect's designs. The floor is of narrow deal, 1½in. boarding. The area will be seated for 1,500 persons, and the gallery will accommodate another 500. The gallery front is very plainly treated in rigid lines of deal panelling, painted green, and oak rail. On the Charles-street front is the gym-

nasium, 125ft. by 55ft., and about 40ft. in height. It is also provided with a gallery, and the floor is of narrow deal boards. The roof is of steel, arranged as queen-post trusses, carrying deal purlins, with 1½in. boards, felt and slates, and the dado is of salt-glazed bricks. The swimming-bath adjoins the gymnasium, and is of like dimensions, 125ft. by 55ft., the pond itself being 100ft. in length. A noteworthy feature of the scheme is that very few classrooms—some half-dozen in all—are provided; but there are no less than twenty-six workshops, averaging 50ft. by 40ft., arranged in five stories, while it is under contemplation to build other workshops over the central courtyard. The refreshment-rooms are on the first floor, opening on to the gallery of the gymnasium and of the swimming-bath, and occupy a space of 70ft. by 25ft. There is a separate entrance for women, but the separate staircase originally insisted upon has been abandoned, and it is probable that the refreshment-rooms may eventually be thrown into one. Adjoining are the women's club-rooms, cookery demonstration room, and apartments for the lady superintendent. All the floors to corridors and stairs are of fire-resisting construction, of coke breeze and cement laid on steel girders. The steel work has been supplied by Messrs. Moreland and Co. and Messrs. Lindsay, Neale, and Co., but are being fixed by the contractor, who is also constructing all the flooring. The heating is steam, and is being carried out by Messrs. Z. D. Berry and Sons, of Westminster, and the windows are fitted with the National Accident Prevention apparatus. Mr. Mountford mentioned that the construction was similar to that carried out from his designs at the Battersea Polytechnic; but it is curious to notice how the interpretations of district surveyors differed as to the same Building Act, Mr. Carritt insisting at Clerkenwell on fireproof stairs even down to the men's lavatory in the basement. The building will be fitted throughout with the electric light, which will be manufactured in the basement at an estimated cost of 2½d. per unit, as against 7d. demanded by the company supplying the district.

#### CHIPS.

The Wesleyan Chapel Extension Committee sanctioned on Monday the erection of new chapels at Aigburth-street, Liverpool, to seat 400, at a cost of £2,400; Little Steeping, Spilsbury circuit, seat 90, cost £315; Brimington, Chesterfield, seat 294, cost £1,400; Dyserth, Rhyl, expenditure £1,142, accommodation 300.

The dispersal of the first portion of the collection of decorative objects formed by the late Sir E. J. Dean Paul came to a conclusion at Messrs. Christie, Manson, and Wood's on Tuesday, the five days' sale of 556 lots showing a total of £20,328.

The Glasgow Corporation Police Department resolved on Monday to appropriate a sum of £300 to obtain from an outside engineer plans and estimates of the cost of a bridge over the Clyde at the harbour, about a mile further down the river than Glasgow Bridge, the lowest at present.

An official inquiry in connection with the scheme of the London County Council for the improvement of the insanitary area of Clare Market was opened on Wednesday week before Mr. H. T. Stewart. The density of the population in the area under consideration is remarkable, being 905, 770, and 1,222 to the acre in the three sub-sections respectively. The density of the population for the whole of the Metropolis is 58·8, and in the Strand district 143. The death-rate for the district is no less than 38·53 per thousand.

The annual soirée, concert, and assembly of the East of Scotland District of the United Operative Plumbers' Association were held in the Literary Institute, Edinburgh, on Friday night. Bailie Pollard presided over a large attendance, and was supported on the platform by Councillors Cameron, Waterson, and Mallinson, and the leading employers in the city.

The Rotherham Town Council have decided to carry out a scheme of sewage treatment similar to that adopted at Wolverhampton, and have appointed Mr. R. E. W. Berrington, of the latter town, as engineer. The estimated cost will be £100,000.

At a meeting of cabinetmakers held on Friday night in Free St. David's Hall, Morrison-street, Edinburgh, steps were taken for increasing the number of trade unionists among cabinetmakers, with a view to the improvement of the conditions under which they now work.

The next examination at Cambridge University in Sanitary Science will be held in April. The examination in Part I. commences on Tuesday, April 7, and in Part II. on Tuesday, April 14.



## CONTENTS.

Blessings in Disguise .....	371
Counting the Cost .....	372
The Royal Institute of Painters in Water Colours .....	373
Masonry and Stone-Cutting .....	374
Notes on Domestic Drainage.—VI.....	379
Valuations and Appraisements .....	380
The Northampton Polytechnic Institute, Clorckenwell .....	380
THE BUILDING NEWS DIRECTORY .....	381
Our Illustrations .....	381
Competitions .....	381
BUILDING NEWS DESIGNING CLUB .....	382
Strength of Pillars .....	382
The Strand Improvement Scheme .....	389
Architects' Benevolent Society .....	399
Architecture at the Royal Scottish Academy .....	399
Obituary .....	400
Architectural and Archaeological Societies .....	400
Building Intelligence .....	401
Correspondence .....	401
Intercommunication .....	402
Legal .....	402
Legal Intelligence .....	402
Our Office Table .....	403
Meetings for the Ensuing Week .....	404
Trade News .....	405
Tenders .....	405

## ILLUSTRATIONS.

THE HALL OF THE CUTLERS' COMPANY. "THE SHEPHERD IN THE BUSH": SCULPTURED PANEL AT THE PASSMORE EDWARDS PUBLIC LIBRARY, HAMMERSMITH.—DUDDING HILL ROAD SCHOOL, WILLESDEN.—NEW ART GALLERY AND PUBLIC BUILDINGS, READING.—DESIGNS FOR GAME-KEEPER'S COTTAGE.—PRACTICAL MASONRY.

## Our Illustrations.

## CITY GUILDS, NO. XVII.—THE CUTLERS' HALL.

UNITED AS "cutlers" in 1425 by Henry IV., this ancient Guild originally traded as forgers of blades, or bladers, makers of hafts, and sheath-makers. Their last old hall was situated in Cloak-lane, Dowgate-hill, and its removal took place in 1854, when their premises were rebuilt. About ten years ago, after their City buildings had made way for railway extensions, the Cutlers' Company erected their present hall in Warwick-lane, Newgate-street, at a cost of £19,000. The architect was Mr. T. Tayler Smith, who at that time was surveyor to the Company. Our present illustration represents the interior of this new hall. The builder was Mr. William Brass, and the decoration work was carried out by Messrs. Worrall and Stephens. Mr. Sax did the bells, Mr. Seale the carving, and Mr. Starkie Gardner the gas-fittings and metal-work.

## "THE SHEPHERD IN THE BUSH": PASSMORE EDWARDS PUBLIC LIBRARY, HAMMERSMITH.

IN the 14th and 15th centuries our ancestors were given to indulge in the old graphic pun or "name devyse" in many of their buildings, as also in their stained-glass patterns and carvings of their enrichments. At Wells, for instance, in the Vicar's Close, the rebus of Richard Swan is depicted by three swans on one of the chimneys. Hugh Sugar also figures by "H" and three sugar-loaves, and in another place John Talbot appears. The bird-bolt piercing a barrel answers for "Bolton," or an eye and a tun for "Eyton." Rose Hill is another favourite and ready-made example. At Westlington, near Aylesbury, there was formerly a glass roundel worth naming of Park-hurst, the family of John, Bishop of Norwich in the days of Elizabeth. The rebus may be traced back to the Romans, in fact, if precedents for such carvings are wanted, and the reference is of more than passing interest. The accompanying sheet shows an idea on the same lines which has been lately sculptured on the main gable of the Public Library in the Uxbridge-road which Mr. Passmore Edwards is building, adjoining Shepherd's Bush-green, for the parish of Hammersmith. The sculpture is nearly life-size, and was executed by Mr. Nathaniel Hitch, of Vauxhall. The notion was suggested by the unsuccessful endeavour which was made last year to change the name of Shepherd's Bush-green into "Cromwell Park." The cartouche panel, also shown in the lithographic plate, is placed near the angle of the building, and bears the dedication inscription to Leigh Hunt and Charles Keene (the famous *Punch* artist), as a memorial to two distinguished Hammersmith men whose names are associated prominently with art and

letters. The carving is executed out of a hard block of white Portland stone, and the lettering is gilded. A movement, with the assistance of Mr. J. P. Heseltine, is being made by the admirers of Charles Keene to erect inside the vestibule of the Library a memorial bronze portrait medallion, and Mr. George Frampton, A.R.A., has undertaken the work, in which he has personally a great interest, and it is hoped that a similar bust of Leigh Hunt will also be erected as a companion portrait. The wrought-iron date scroll, represented in the illustration, occurs on one of the chimneys. A view of the Library was published in the BUILDING NEWS for March 29 last year, and a detail of the façade appeared on July 5. The builders are Messrs. W. Johnson and Co., and the oak fittings are being executed by Messrs. Adamson and Sons. The architect is Mr. Maurice B. Adams. The Library is to be opened in May.

## DUDDING HILL SCHOOLS.

A COMPETITION limited to three invited architects was instituted for these schools, and Mr. Mac-Vicar Anderson was appointed assessor. He awarded the first place to the design of Mr. W. D. Carge, here published; but his award was not carried out, for reasons which did not reflect credit upon the board. The plan speaks for itself. Economy, both in construction and in future school management, combined with efficiency and completeness, were the main objects sought. Economy of space was secured by an absence of corridors, and by convenient inter-planning of mezzanine to obtain teachers' rooms and cloakrooms in connection with the staircases. The plan, however, was somewhat marred by a foolish requirement of the board that every two contiguous classrooms should be capable of being made into one by sliding partitions.

## NEW ART GALLERY AND EXTENSION OF FREE PUBLIC LIBRARY AND MUSEUM BUILDINGS, READING.

WHEN the Reading Town Hall, Free Library, and Museum Buildings were erected some fifteen years ago, the scheme was to a great extent marred by the fact that the town council were unable to obtain possession of a property which stood on the corner adjacent to the site of the library, &c. The illustration shows the addition about to be built on this corner site, together with its relationship to the present buildings. Advantage is being taken at the same time to make some useful improvements to the library department, in order to bring it up to date, as necessitated by the growth of the town. The plan shows the ground floor as altered. The new part of the first floor will be occupied by a large top-lighted picture-gallery, and the present museums will be rearranged. The scheme also includes a large basement, and extensive modifications of the heating and ventilating appliances. The external treatment has to a large extent been governed by the design of the adjacent buildings, but this has been departed from where required by the different uses of the rooms. It is worthy of note that in this museum the Romano-British remains from Silchester (Calleva Atrebatum) will be housed. Another interesting exhibit is the fac-simile of the Bayeux tapestry. The architects are Messrs. Cooper and Howell, of Reading, and, subject to the approval of the Local Government Board, the contract has been placed in the hands of Mr. McCarthy E. Fitt, also of Reading. The cost will be about £8,000.

## "BUILDING NEWS" DESIGNING CLUB: A GAME-KEEPER'S COTTAGE.

(SEE description on page 382.)

Two parallel arcades, with a connecting link in the centre, are about to be built in New Briggate and North-street, Leeds, from plans by Messrs. Smith and Tweedale, of that city. One of the arcades will be 286ft., the other 263ft. in length, and both will be 18ft. wide. The cross arcade will be 105ft. long and 15ft. wide, providing in all 56 shops. These dimensions are considerably greater than those of any other arcade in Leeds.

Among those who have accepted invitations to the annual dinner of the Institution of Surveyors, to be held at the Whitehall Rooms on Wednesday next, are the Earl of Jersey; Mr. Jesse Collings, M.P., Parliamentary Secretary to the Home Department; Mr. Horace Plunkett, M.P.; the Recorder of London; the Chairman of the London County Council; the Sheriffs of London; the President of the Royal College of Surgeons; the President of the Incorporated Law Society; and the President of the Society of Mechanical Engineers.

## COMPETITIONS.

CLEETHORPES.—Forty-five sets of competitive designs for the proposed new municipal buildings at Cleethorpes were on exhibition at the Odd-fellows' Hall in that town last week. The drawings of the three following competitors have been selected by the council:—Mr. G. Harold Elphick, Broad-street House, Broad-street, London; Mr. A. K. Mayston, A.R.I.B.A., No. 38, Marquis-road, Stroud Green, N.; Messrs. Cooksey and Cox, No. 4, Adam-street, Adelphi, W.C. The assessors engaged were Mr. Watson, quantity surveyor, of Hull, and Mr. Scaping, diocesan surveyor, of Grimsby.

LYTHAM AND ST. ANNE'S GOLF CLUB.—After examination of the 49 designs submitted in this competition, for club-house at St. Anne's-on-the-Sea, the assessor, Mr. Charles Heathcote, architect, has submitted his report. Mr. Heathcote reports:—"A considerable number of the designs are of great merit, although this applies more to the elevations and architectural treatment than to the plans. May I suggest that the drawings of the second and third premiated designs be ultimately returned to their authors, and not retained as mentioned in the instructions? My award, after careful consideration of plan, elevation, and cost, is as follows: First, design by 'Fate,' Messrs. Woolfall and Eccles, 60, Castle-street, Liverpool; second, design by 'Recreation,' Messrs. Cheers and Smith, Blackburn and Twickenham; third, design by 'Expert' (treatment A), Messrs. Woodhouse and Willoughby, 120, King-street, Manchester." The council of the club have adopted the report, and further place as fourth in order the design by "Jewel," submitted by Mr. J. D. Harker, 100, King-street, Manchester.

## CHIPS.

Colonel Yorke, R.E., accompanied by Mr. R. Evans, general manager of the Barry Railway Co., and other officials, was conducted on Friday over the main line of railway between Cadoston and the Rhondda Valley, and made an inspection on behalf of the Board of Trade. The line will shortly be opened for passenger traffic.

The Liverpool City Council have voted £12,000 for the erection of working men's dwellings on sites where insanitary property had been demolished. The front houses are to be let at a weekly rental of 4s. 6d., and those at the rear at from 3s. to 3s. 6d. Each house is to contain four rooms.

The urban council of Trowbridge agreed on Monday to vote £100 to Mr. Stanley, their surveyor, as an honorarium for extra services rendered in connection with the sewerage works now being carried out under his supervision and from his plans.

The London County Council agreed, on Tuesday, to seek Parliamentary powers in the session of 1897 to enable the Council to widen Tottenham Court-road, by the removal of the block of buildings at Bozler's-court on the betterment principle, at an estimated cost of £47,860.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied some more of their patent Manchester grates to the Priory Schools, Acton, those previously supplied having proved very satisfactory.

The Sale Urban District Council were charged before the local magistrates, on Monday, at the instance of the Mersey and Irwell joint committee, with "causing liquid sewage to flow into the Mersey," contrary to law. It appeared that the concrete bottoms of tanks at the sewage works had given way, with the result that the sewage flowed into the river without being "treated." On behalf of the district council it was urged that they had shown great diligence in complying with the requirements of the law. The magistrates imposed a nominal fine, and made an order extending the time for the completion of the works for six months.

Mr. George A. Lawson, H.R.S.A., the sculptor who has recently completed the important frieze for the new municipal buildings at Bath, is now engaged on an interesting series of statues for the new buildings surrounding the old Roman Bath, now being carried out from the designs of Mr. J. M. Brydon. These statues will comprise eight of the Roman governors who were in Britain, to surmount the colonnade. Mr. Lawson has just completed models for the first three of these—namely, Julius Caesar, Claudius Caesar, and Hadrian.

The insanitary property and artisans' dwellings committee of the Liverpool Corporation agreed on Friday to sell to various builders land in Fisher-street, Hughson-street, Prophet-street, and Fernie-street, which formed the sites of insanitary houses, for the erection upon it of four-roomed cottages for workmen. The area is sufficient for from 70 to 80 cottages.



## "BUILDING NEWS" DESIGNING CLUB.

## A GAMEKEEPER'S COTTAGE.

ACCOMPANYING these remarks are two lithographic plates given in illustration of the designs placed first and second in this competition by "Tadpole" and "The Owl." The third place is awarded to "A. B. C." The following were the instructions issued for competitors:—"A Gamekeeper's Cottage on the roadside at the skirts of a wood, to be built in half-timber, on a ground-floor story of rubble stone walling, with hammered stone angle-quoins of big scantlings. The house to comprise a sitting-room, 14ft. by 12ft. 6in., a kitchen living-room of rather larger area, a scullery, and three bedrooms. A gun-room, 10ft. by 8ft., or thereabouts, to be located near the porch, and leading out of the entrance-lobby. An outbuilding comprising game and house larders, one distinct from the other, besides a bake and wash-house. A tool-place and E.C. to be contrived, with a fruit and root-store loft over the whole. Scale, 8ft. to the inch. Elevations, plans, section, and view. The site presents no special difficulties as to frontage or levels. The cottage will stand in its own garden away from the kennels." We found some little difficulty in arriving at a choice, for the good and satisfactory reason that the best of the plans submitted were very nearly even in merit. On the whole, "Tadpole" seems to have produced the most appropriate cottage. His drawing is rather hard in execution, and is not so artistically rendered as "The Owl's" sheet, which thereby gains no small advantage. In execution this effect, to some extent, would not remain, and, of course, all new work has a tendency to look hard; indeed, time alone can give the character of age as well as much of that appearance of quaintness which a sympathetic draughtsman seeks to indicate by an artistic manipulation of the pen. The architect does well when he sets his face against a hard cast-iron effect creeping over his buildings, making them look as if they were produced by mere living machines; and all the time we proceed without a vernacular art, his task is no doubt rendered exceedingly difficult in this respect, seeing that the artificer works with mechanical ideas only, and is governed for the most part by conditions which crush out any little individuality he may have originally aspired to. On the other hand, the architect is ill-advised when he overlooks the fact that he is engaged on the erection of new buildings, built to withstand the elements and serve a practical purpose. Crumbling ruins and open-jointed masonry are no doubt artistic looking, while undulating lines are more pleasing than rectilinear ones. The student, at any rate, however, must not deceive himself by tricks of draughtsmanship. "The Owl" has not fallen into this mistake, but his pencil tends to stray in that direction. "Tadpole's" design may possibly, to the superficial observer, suffer in comparison for the reason which we have not failed to remark. His plan is a good one, and when built the cottage would look well. The introduction of a lavatory and w.c. adjoining the gun-room would be a convenience to the sportsman, and the sitting-room door, instead of that to the kitchen, facing the entry is a decided point in favour of this plan. The stairs are sufficiently masked from the front door, though they might have started, perhaps, from out of the sitting-room, instead of introducing a villa-like hall in a wood-side cottage, where the primitive farmhouse type of plan is certainly most at home. "The Owl's" cottage is too small-looking, and would not appear in execution so well, or so long on the flank, as his perspective sets forth. The kitchen and stairway, in full view of the master, on any unexpected call might be unpleasant for all parties, and the sitting-room planned away in this fashion would convert it into a show-room, which is entirely out of character in such a house. The scullery is cramped by the stairs, and we doubt the utility of a slipper-bath in such a place. The dresser, too, should not be located in front of the kitchen window. The front elevation is very pretty. "A. B. C." comes next, and with more experience will probably improve. The long line made by the outbuildings towards the north gives a convenient covered way facing the south which would add to the gamekeeper's comfort, and it insures the horizontal effect so essential in picturesque country buildings. His plan fails in the principal rooms, which ought, by preference, to run out of each other. "Invicta" draws in a telling way,

with a sense of sunshine and colour; but he is not so simple in his ideas as we should like to see, and we fancy he is not so attentive to practical matters as he might be. The cut lintels over the windows would never be so treated, and certainly would break. They look very weak and very ugly. The plan groups itself round a needlessly lofty chimney-stack like that to the lodge in Kew Gardens, and the plan makes the house too much of a *cottage orné*. "Moonraker" contributes a very pretty hillside sketch, which makes us wish to see more of his work, and his plan has some good points. Its defects are seriously opposed to anything like comfort. The master would have to reach the middle of the house, and almost go into the scullery, to get at the gun-room. The doors open directly on to the fireplaces, and the bedroom plan is not nice. "Fear" has the merit of simplicity. His bedroom plan is eminently good; the entrance and gun-room are convenient. The scullery is wrongly placed between the parlour and the kitchen, and, in fact, the author has not done himself justice, or his design either. The plan is not compact enough to be considered inexpensive with so extensive an expanse of roofing, and a proprietor would be likely to consider the cost, even if land may be worth but little. "Giles" has a very compact arrangement which commends itself, though the yard is needlessly contracted, cramping all the outbuildings in a very confined way. The exterior is not nicely delineated, and it has a stilted appearance, which ill accords with the spirit of old half-timbered buildings. "Once More" has a grip of the picturesque, though his interpretation of the style adopted has a smirch of the merely pretty, introducing rather too many conceits which, in a park-drive close to a very modern house, would look more at home than by a wood-side in the heart of the country. "Demetrius" handles his pencil with freedom, and seems to value the artistic side of things. His cottage is well contrived on plan within the lines of a square; but the cube is really too small for the large treatment of a second gable, and the waste of space in the roofs is considerable. "Demetrius" shows promise in his work. "Mac" does the same; but we see no real advantage in depicting his cottage in a thunderstorm. The planning is not so good as the last: the gun-room is too much involved in the other arrangements of the building, and the head-room to the stairs is a very close fit. "Ivy," with the circular tower at the corner, mistakes the spirit of cottage building, which should always be simply treated. The gun-room and its adjacent lavatory are noted as good points, and the semi-octagonal bedroom over as a very bad one. "Cygnette" is improving, but the plan is far from perfect. The perspective is better than some others. "Beckington" has a very similar plan, and is too villa-like in appearance. The columns to the porch are quite out of place, and the half-timber work does not realise the example set by old instances, which require to be kept in view by any designer who wishes to do good work. "Kafir" is much better in this respect, and his plan follows rather the type of ancient houses. The staircase projecting into the dining-room is an inconvenient barbarism. "Canary" is another member whose work shows a serious endeavour. The cast-iron verandah-like porch we do not like, and the stairs leave precious little space below them at the entrance to the living-room, and would have to be very steep. "Oberon" is too rambling and cut-up in his treatment, and the same remark applies to "Punt," whose house is more than a cottage in the sense intended. "B"—in a circle—does not obey the rules as to the size of the drawing-paper sheets, and he draws mechanically. "Fac et Spera" is too theatrical and ambitious with the rustic bridge, pine-woods and stream, the woman feeding the chickens 'midst Arcadian "fixings." The design is ill-considered, but the work is painstaking, though misjudged. J. G. P. Meaden puts no motto, and his design in outline is very hard, and no view appears. "Picwick" has a semicircular arched window more suited to a public bath. The inglenook is quite needless in a gamekeeper's house. "Thrush" places the gun-room w.c. too much to the front. The hall would be dark, and the plan is not so good as the external treatment, which is rather commonplace. "Bee's" larder building is prettier than the cottage, which is of the ordinary lodge type. "Leemo" is very careful; but it is not clear why he should fix up a lavatory and w.c. imme-

diately out of the sitting-room, and by dividing the cottage into two by the hall, half the house is presumably reserved for the shooting parties. "Moor" comes next, and then "Snapshot," whose design looks like a seaside villa of the regulation mode, the lower walls built in random rubble. "Blau" and "La Cigale" try their best and work neatly, so that we have every desire to encourage them in their studies. At present we can say no more. "Dessinateur," "Breton" (who ignores the rule as to size of paper), "Sanitas," "Dunelm," "Ghiberti," "Overture," "Veller," "R" in circle, and "Venus" complete the series. One remark to "R" in circle, and that is, to advise him to drop this silly style of drawing trees and clouds and mushrooms of Broddingnagian proportions. Let him study his plan more thoroughly, and consider the comfort of the tenant, avoiding such follies as solid-shaped projecting stone window-heads like that to the third light of the kitchen window. We should not trouble to notice "R" if we did not think he ought to know better.

## STRENGTH OF PILLARS.

A VALUABLE paper on this subject, which was recently read before the American Society of Civil Engineers by Leopold Eidlitz, the author of the well-known and able work on the "Nature and Functions of Art," is printed in the *Transactions* of that society. Mr. Eidlitz examines mainly the question: "What is the maximum strain in pillars compressed endwise in the centre of resistance by weights less than the breaking weights, or by weights not applied in the centre of resistance?" Under increasing loads the deflections of a pillar increase at a greater ratio than the loads causing them, and the reverse is also true. Mr. Eidlitz shows that a short specimen of cast iron of lin. sectional area is crushed by a compressing force of 96,000lb.; but as the specimen becomes longer, the force required to disintegrate becomes rapidly less. When under 5in. long it will break under 85,000lb., when 10in. long under 45,000lb., when 15in. long under 30,000lb., and so on. The author considers the nature of elasticity, which is the internal force which maintains atomic relations; its potential elasticity is the sum of this persistence. The exertion of the elastic force is accompanied with "fatigue," which is the reduction of the above force, and the amount of this fatigue is so delicate as to elude the senses, and can be only measured by instruments. The tables which accompany the author's paper are numerous, and give very elaborate results. Some of these show the compression of inch areas of cast and wrought iron for various loads, the breaking-weights of cast-iron and wrought pillars of diameters from 5 to 50 and under eccentric loads. Tables are also given showing compression for brickwork piers under loads up to 2,000lb. per square inch, deduced from the Watertown Arsenal experiments. The last table gives the results for yellow pine square posts from 0 up to 60 diameters, loaded on the centre, when dry and not dry. Thus, a post of 15 diameters had a breaking weight of 7,800, a deflection of .00428, and safe load of 795, with a deflection of .0010; at 20 diameters the breaking-weight is 4,400, deflection .13636, safe load 695, deflection .0025; at 30 diameters the breaking-weight is 1,950, deflection .51750, safe load 460, and deflection .1225; at 40 diameters the breaking-weight is 1,100, deflection 1.0454, safe load 290, deflection .2900. One half the safe load to be taken when the wood is not dry. We refer our readers to the useful analysis and tables of Mr. Eidlitz.

Mr. George Payne, F.S.A., secretary of the Kent Archaeological Society, has reported to the Public Library and Museum Committee of Rochester the gift to the city by the Ecclesiastical Commissioners of a valuable collection of Roman antiquities found at the recently discovered Roman villa at Darenth.

The last of the series of fortnightly lectures on art subjects organised by the Parks and Galleries Committee of Glasgow Corporation was delivered on Saturday evening in the Corporation Art Galleries, Sauchiehall-street, Glasgow. The hall was crowded. Mr. William J. Anderson, A.R.I.B.A., was the lecturer, and the subject was "The Racial Element in Architecture." Mr. Anderson dealt with the influence architecture had on our knowledge of the literature and manners of the ancient peoples, and described, by means of lantern views, the types of dwellings of different races.

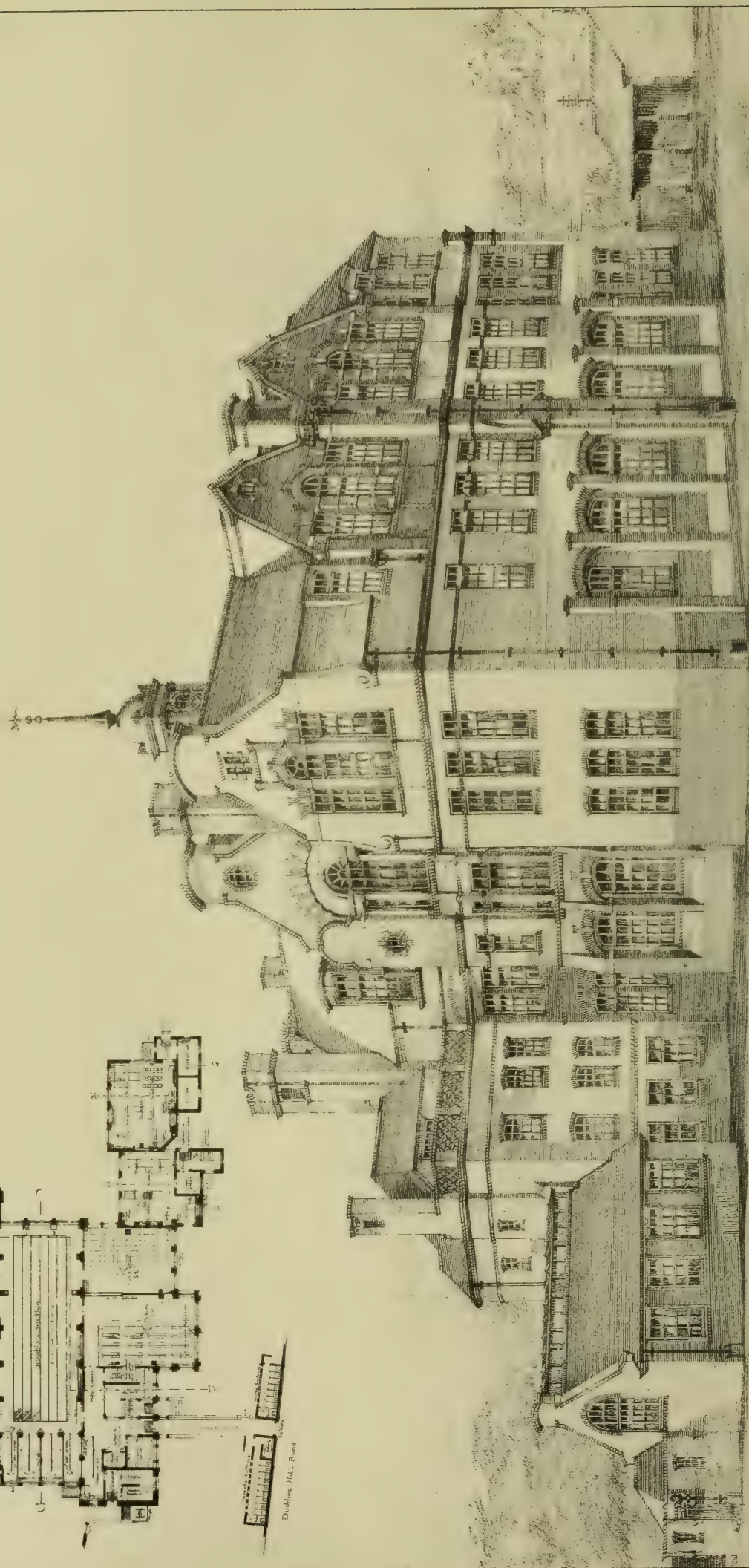
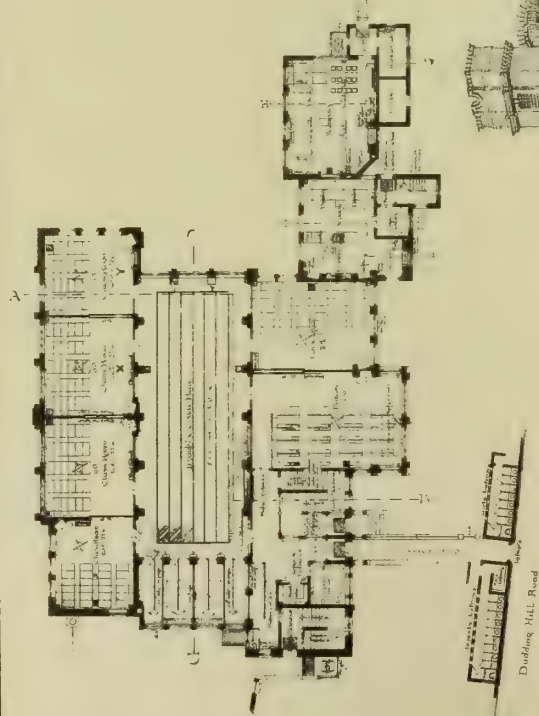






THE BUILDING NEWS, MAR 13, 1896.

DUDDING-HILL ROAD SCHOOL FOR WILLESDEN SCHOOL BOARD W.D. CAROE, MA. ARCHT.









The Building News, Mar 13, 1896.

PASSMORE·EDWARDS·PUBLIC·LIBRARY·UXBRIDGE·ROAD·SHEPHERDS BUSH·HAMMERSMITH

MAURICE B ADAMS

FRIBA·ARCHITECT



DEDICATION TABLET  
CARTOUCHE = EAST FRONT



MAURICE B ADAMS DEL.

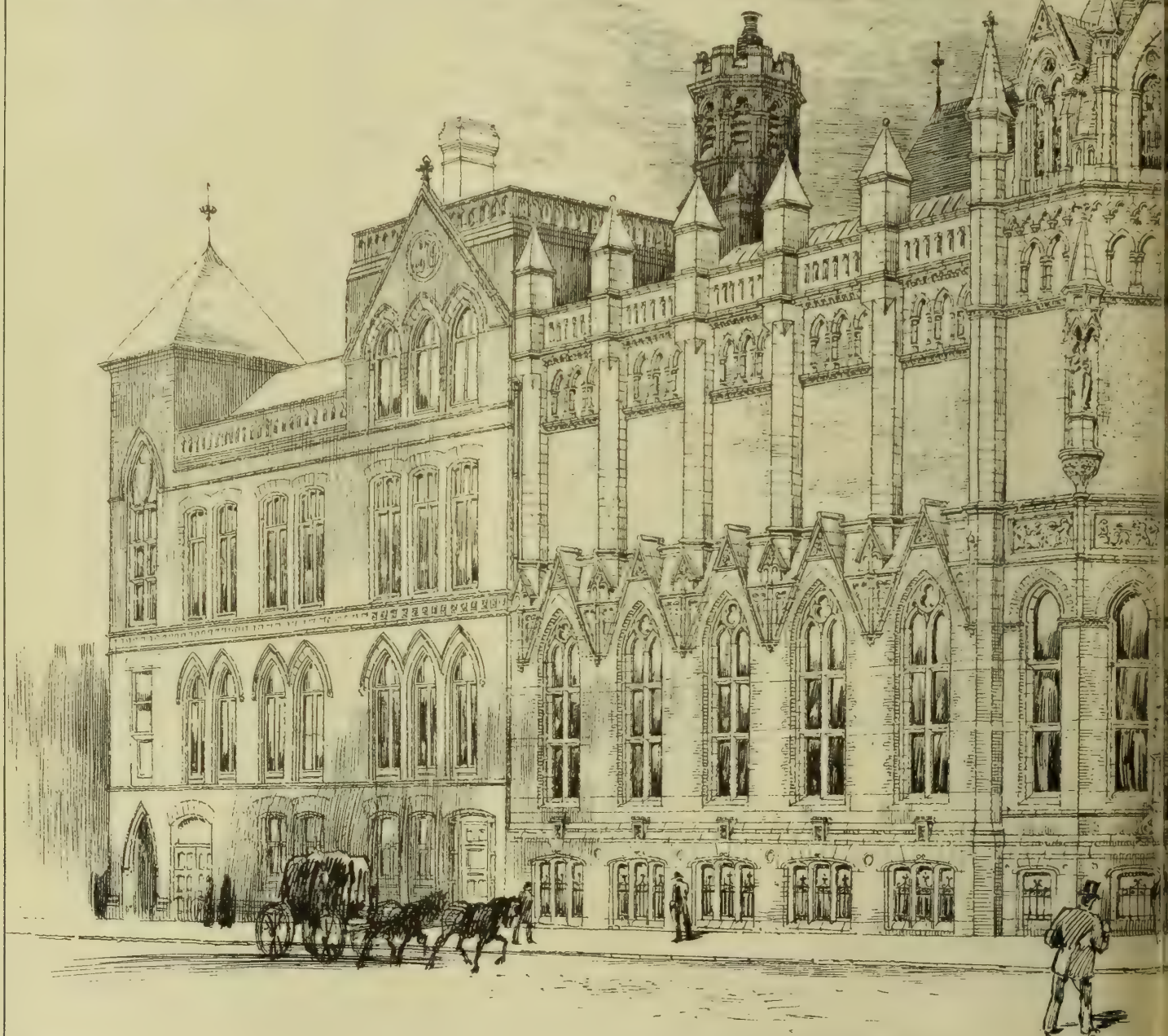
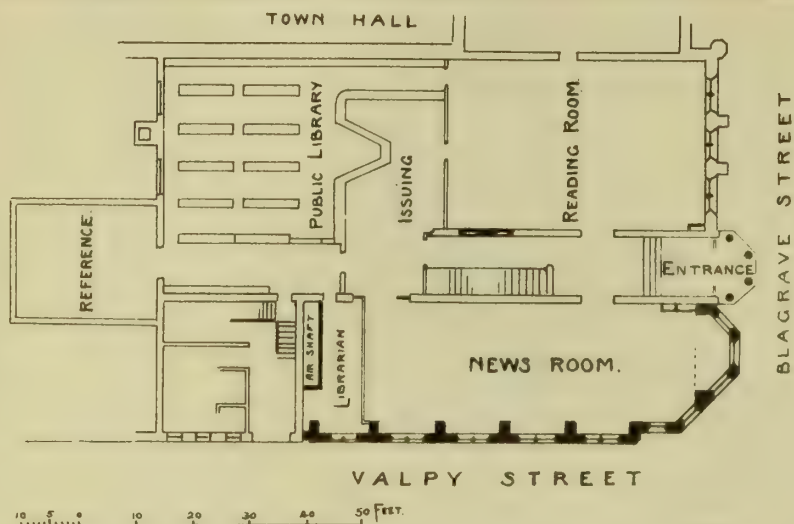
NATHANIEL HITCH SCULPTOR

SCULPTURED·PANEL·OF·"THE·SHEPHERD·IN·THE·BUSH·IN·THE·MAIN·GABLE·(ABOUT LIFE SIZE)











S. MAR. 13, 1896.

NEW ART GALLERY - PUBLIC BUILDINGS - READING - MESSRS COOPER & HOWELL ARCHTS











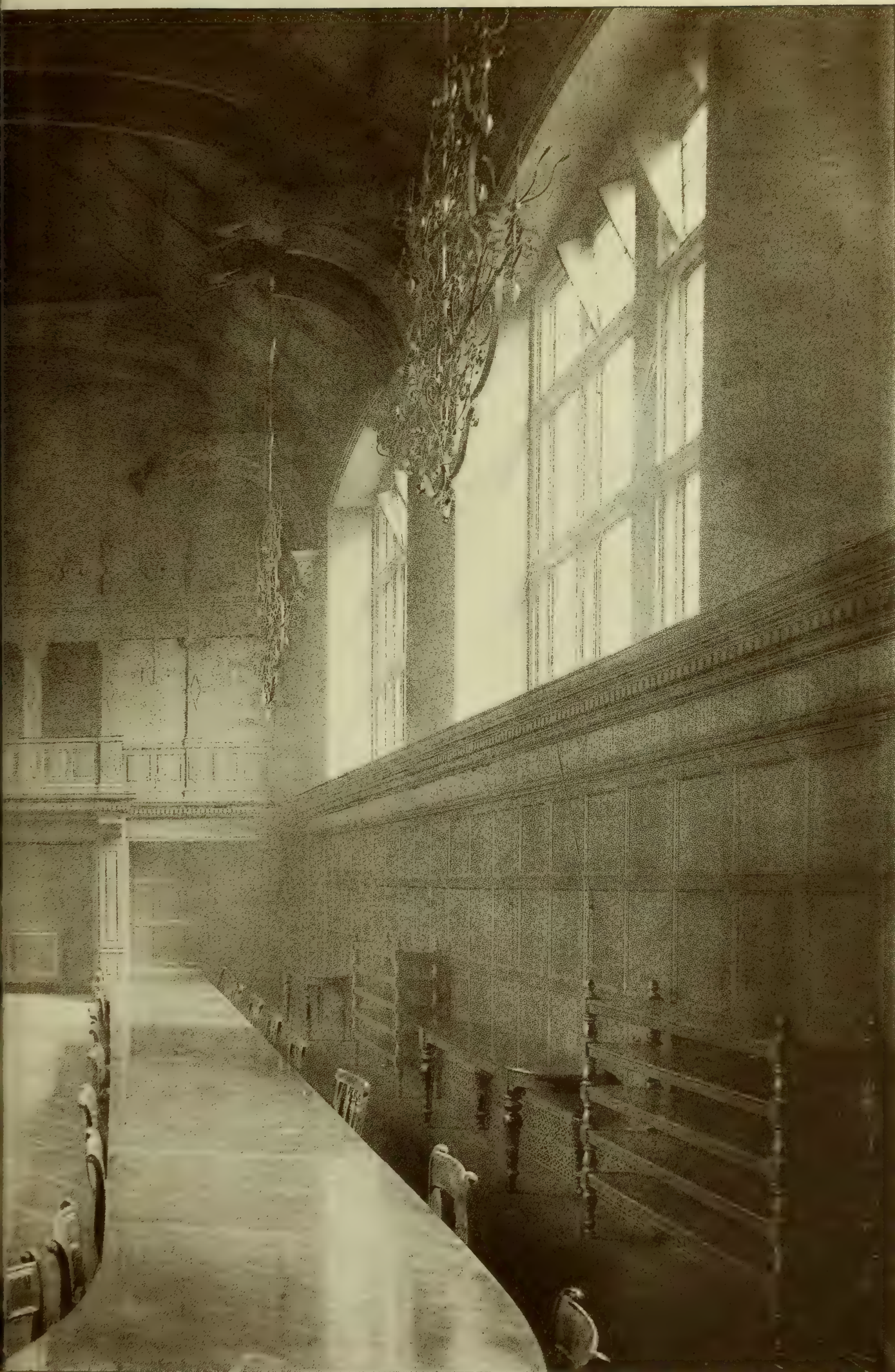




PHOTOGRAPHED WITH A SANDELL PLATE



MAR. 13, 1896.



"PHOTO-TINT," by James Akerman: 6 Queen Square London, W.C.





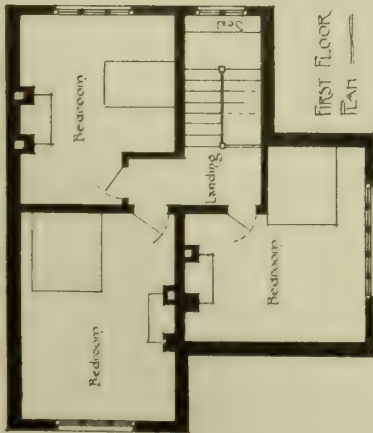




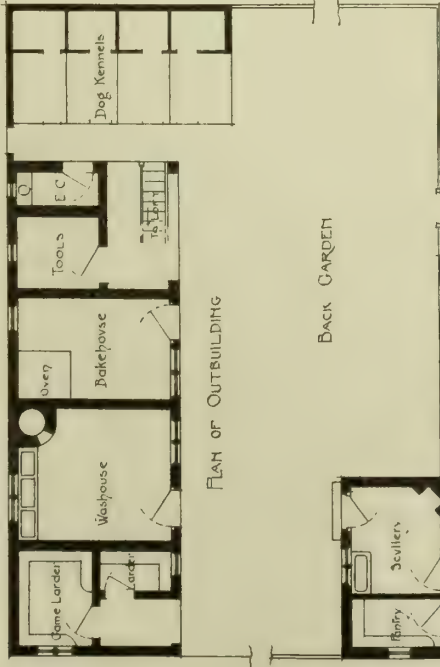






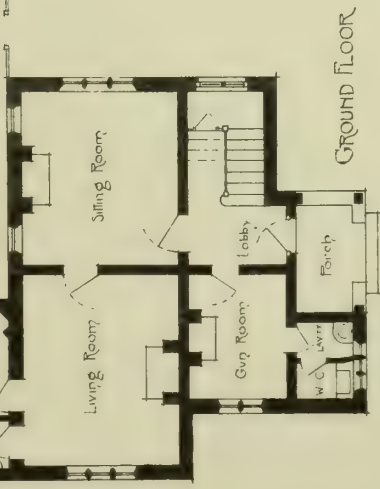


FIRST FLOOR PLAN

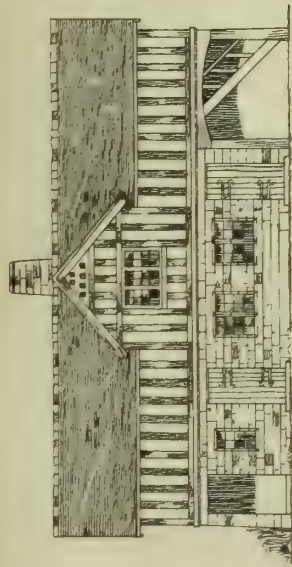


PLAN OF OUTBUILDING

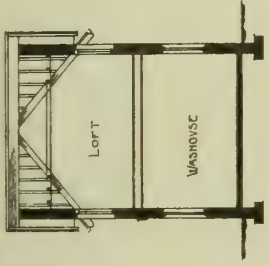
BACK GARDEN



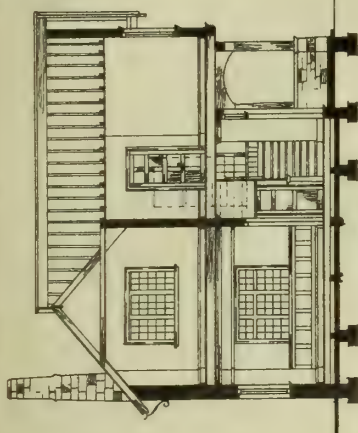
GROUND FLOOR



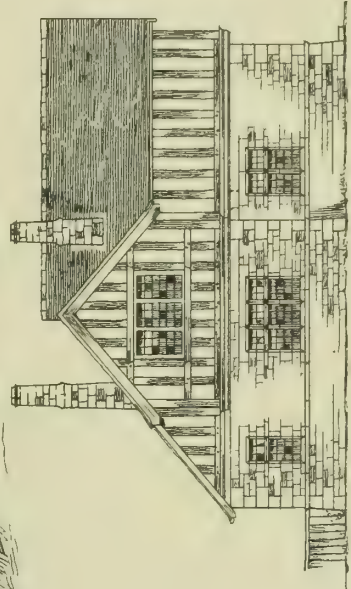
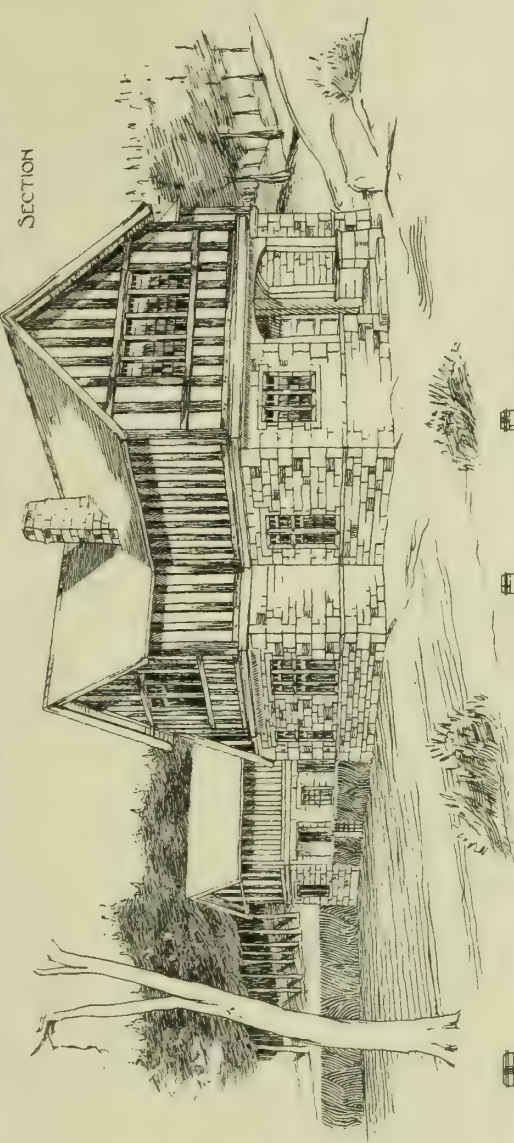
ELEVATION OF OUTBUILDING



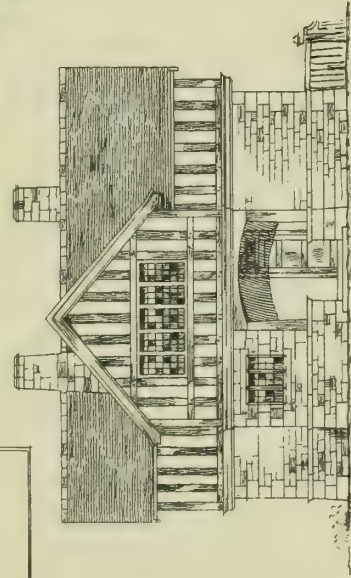
SECTION



SECTION



SIDE ELEVATION



FRONT ELEVATION

THE BUILDING  
NEWS DESIGN-  
ING CLUB. A  
GAMEKEEPER'S  
COTTAGE BY  
TADPOLE  
FEBRUARY 96.



Scale of Feet







## THE STRAND IMPROVEMENT SCHEME.

**T**HE new scheme for a broad thoroughfare between Holborn and the Strand, just propounded by the Improvements Committee of the London County Council, follows, as will be seen by the subjoined official plan, the principal lines of the proposal of October last, the main point of difference being that the width is now recommended to be 100ft. throughout, in lieu of 90ft. The proposal is, it will be observed, to drive a new street in an approximately direct line from the junction of Theobald's-road with Southampton-row, through the latter street, and then crossing Holborn, proceeding southwards to the church of St. Mary-le-Strand, on the east or City side of Little Queen-street, over the electric lighting station in Sardinia-street, across Vere-street and Stanhope-street, over the Olympic Theatre, and so, with a sweep westwards, to the east side of New Church-court, and eastwards to the Globe Theatre entrance, the western wing just opening out the Strand Newspaper Company's

foundation, the amount received in subscriptions being largely in excess of any previous year.

While, however, having this cause for satisfaction, the council would at the same time direct attention to the fact that a greater demand has been made upon its resources than in former years, and that although the sum of £413 15s. was the income derived from subscriptions during the year, £70 was paid to pensioners, and £604 to applicants for grants, together making a total of £674 (as against £589 in 1894) distributed in relief.

With regard to the capital account, a balance of £169 8s. 8d. having been brought over from 1894, an investment was made in the purchase of £100 Caledonian Railway 4 per cent. Debenture Stock at a cost of £143. During the year the sum of £91 7s. (as against £85 14s. in 1894) was received in donations, so that the balance in the hands of the bankers at the credit of the capital account on the 31st December last was £117 15s. 8d. The donations were chiefly contributed by Mr. Graham C. Awdry (£25), Colonel R. W. Edis (£21), Mr. Wm. Emerson (£7 7s.), Mr. Zeph. King (£5 5s.), Mr. Wm. Kidner (£5 5s.), Mr. A. H. Tiltman (£5), Mr. Geo. T. Hine (£5), and Mr. George Inskipp (£3 3s.). A further sum of £5 15s. was also contributed as a donation by the Spring Gardens Sketching Club.

Five meetings have been held by the council during the past official year. The pension of £20, which was awarded last year, having again become vacant through the death of its recipient, the vacancy was announced in the professional papers, and the pension awarded to one of the four persons who applied. It should also be mentioned that Mr. J. G. Finch Noyes, who was elected co-auditor with Mr. W. Hilton Nash at the last annual general meeting, being unable to act on account of absence abroad, Mr. John Hebb kindly undertook, at the request of the council, the duties in his stead.

The following gentlemen, being the five senior members, retire by rotation from the council, namely:—Mr. Thomas Blashill, Mr. Sydney Smirke, Mr. William Grellier, Mr. E. B. P'Anson, and Mr. E. H. Martineau. To fill the vacancies caused by these retirements, the council have the pleasure to nominate Colonel R. W. Edis, Mr. Arthur Crow, Mr. E. A. Gruning, Mr. G. T. Hine, and Mr. W. Hilton Nash.

The balance sheet and income account for the year ended December 31, 1895, duly audited by Mr. W. Hilton Nash and Mr. John Hebb, were submitted.

Mr. H. H. Collins moved, and Mr. William Woodward seconded, the following resolution, which was agreed to:—"That the council for the year 1896-97 be elected as follows: Mr. J. M. Rickman, Mr. R. St. A. Roumieu, Mr. J. T. Wimperis, Mr. Thomas Harris, Mr. H. C. Boyes, Mr. Wm. Kidner, Mr. Geo. Scamell, Mr. Zeph. King, Mr. George Inskipp, Colonel R. W. Edis, Mr. Arthur Crow, Mr. E. A. Gruning, Mr. G. T. Hine, and Mr. W. Hilton Nash."

On the motion of the chairman, seconded by Mr. E. H. Martineau, Mr. J. Macvicar Anderson was elected a trustee, in place of the late Mr. Thomas Cundy.

Votes of thanks were passed to Mr. Arthur Cates and Mr. Percivall Currey for their services respectively as hon. treasurer and hon. secretary, and each gentleman was re-elected in his office for the ensuing year. Mr. Wm. Woodward and Mr. Henry Hall were elected auditors. Mr. Cates proposed, and Mr. T. M. Rickman seconded, a vote of thanks to the Royal Institute of British Architects for affording office accommodation to the Society.

A hearty vote of thanks having been accorded to Sir Arthur Blomfield for presiding, and the chairman having briefly replied, the meeting terminated.

## ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.

**T**HE largest and most important of the list of subjects in church architecture is the "Coats Memorial Church, Paisley," by H. Blanc, R.S.A. It is drawn to a large scale, the architectural detail has been very faithfully rendered, and the whole has a fine pictorial effect. The drawing gives an excellent idea of the building in relation to its site, but without any suggestion of the immediate surroundings. This, as is well known, is one of the most costly and splendid specimens of church architecture which has been, or is ever likely to be, erected in Scot-

land. The exterior, which has been well illustrated in the pages of the BUILDING NEWS, needs no description, further than to state that it is cruciform in plan, with wide, short nave and narrow passage aisles, a tower of lofty proportions, surmounted by a crown resembling that of St. Giles's. The edifice occupies the summit of an apparently isolated eminence, and the access is made easy by gently sloping roadways to a plateau about half-way up. This terrace gives access to hall below the nave of the church, and to a staircase of about 30 steps, magnificently broad, being about as broad as the church itself. Three porches of considerable projection show very richly-moulded doorways, and over these is the large window of the nave, a combination of Early Lancet and Geometrical design. The exterior as a whole lacks proportionable length, a defect rather intensified by the erection of the tower over the crossing, which is a square of the narrower proportions of the transept width. The defect is inseparable from the requirements of the plan, which provides for a moderately large audience being massed as equably as possible around the preacher, and with no pillars to obstruct the view. But in this instance the vertical proportions of the height—especially in the nave, with its lower floor—are so dominant that there is nothing at all akin to the broad, squat, and generally ungainly proportions of churches constructed with these narrow aisles. The church is said to have cost about £80,000, the greater portion of which will be taken for the sumptuous appointments and constructive details of the interior, a sketch of which would be very interesting to the public. 455, "Design for St. Andrew's Church, Ayr," by J. A. Morris and Hunter, is the only other sample of church architecture with much decorative detail. It is in water-colour, and a fine pictorial representation of a church in the Later Perpendicular style, with very good tower and spire placed at one side of its west front, and the usual door and window over in the nave gable. The aisle appears to be constructed with a succession of projecting gables. The architects have been lavish of the surface panel decoration peculiar to some examples of the style, but have perhaps carried the decorative detail to an extreme in crocketing the upper angles of the spire, and without the angle rolls general in the Continental examples, which seem to have beguiled their fancy. 458, "Regent Place, U.P. Church, Glasgow," by H. and D. Barclay, is a large and important edifice in the Greek Classic style, with a lofty campanile, and is a noteworthy example of the successful study of harmonious proportions and picturesque grouping of parts without any of the oddities that make some Glasgow churches in this style conspicuous. 456 and 456 are designs for churches, submitted for competition, by Mr. Hunter Crawford and Mr. Miles S. Gibson. Both are good examples of what may be styled economical arrangement in Early Gothic. The one has the usual wide nave to accommodate galleries, and rather much of secular accessory building at the front; the other is a more ambitious design, and shows a nave and double transepts, with massive buttressing and a fine south porch. 499, "New E.U. Church, Bathgate," by J. E. Fairley, is another of the wide-naved galleried churches, and the architect has, at least, so far as the front is concerned, been very successful in masking the proportions with buttressing, pinnacles, &c. 503, "St. Margaret's Convent Chapel, Edinburgh," shows a new apse and other additions, by A. Macpherson. Little, in the perspective given, is to be seen but a lofty octagonal apse, with massive buttresses, surmounted by the parapet. The roof is not visible, and the old original chapel, which was built about 50 years ago in the Perpendicular of that period, seems to have been entirely buried in the recent additions. There is a small window or two at lower levels; but the only lights of any importance, and these by no means large, are close to the roof.

Public buildings in civil architecture form the largest and most important department of this exhibition. The drawings include most of the competitive designs for the new hotel and offices of the N.B. Railway. In 506 Mr. Beattie, whose design is being carried out, gives a large perspective of the exterior as seen from the north-west—i.e., Princes-street—and in 505, a picture of the same size, several views of the interior, the entrance-hall, board-room, &c. These are all in a style of decoration which may be called grand and imposing in their proportions, and give a good idea of the provision made for elegance



Offices. The "island" in Holywell-street and the north side of the Strand will be removed, and two spur streets, each 60ft. wide, are proposed at the Strand end, the eastern one from the junction of the new street with Stanhope-street to St. Clement Dane's Church, the western one from the same junction of the new and Stanhope streets by a widening of Blackmoor and White Hart streets into Wellington-street at the rear of the Gaiety Theatre. The gradient of the new street would in no place exceed 1 in 50. The estimated net cost of the entire scheme is £2,074,800, of which £153,000 is the estimated outlay on the new streets, subways, sewers, and paving, the remaining £1,921,800 being the sum allowed for compensation for property removed after deductions for recompense under the "betterment" system, as laid down in the Tower Bridge Southern Approach Act of 1895.

## ARCHITECTS' BENEVOLENT SOCIETY.

**T**HE annual general meeting of the Architects' Benevolent Society was held on Wednesday afternoon at the Royal Institute of British Architects, Sir Arthur Blomfield, in the absence of the president (Mr. F. C. Penrose), in the chair. Among those present were Mr. Arthur Cates (hon. treasurer), Mr. Percivall Currey (hon. secretary), Mr. Henry L. Florence, Mr. Sydney Smirke, Mr. H. H. Collins, Mr. T. M. Rickman, Mr. George Scamell, Mr. Edward H. Martineau, Mr. Zeph. King, Mr. Wm. Woodward, &c.

The minutes having been read and confirmed, Mr. Percivall Currey (hon. secretary), read the report of the council:

It was the pleasant duty of the council to congratulate the contributors to its funds on the Society's having attained during the year 1894 its greatest degree of financial prosperity since its



and comfort. The exterior does not show any special outstanding variety of its component masses, but, on the contrary, a somewhat monotonous repetition of detail over all the frontages. This, however, gives it the appearance of being larger and more commodious than any of the others, and it distances them all in its elevation to the street by the erection of a massive clock tower. 501 is the design by W. Leiper, R.S.A., as it appears from the north-west with the detail visible. Mr. Leiper in 498 gives also a fine view of the building as seen from a great distance with its surroundings. Viewed from this distance the hotel dwarfs by its magnitude all buildings in its vicinity, and probably will not in this aspect present much, if any, difference as compared with any of the others seen from the same point of view. The characteristic of Mr. Leiper's design appears to be the employment of massive angle and other turret projections, and those flanking the entrance allow of an imposing doorway; but it is questionable if he has improved them by surrounding the topmost stage with rather heavy pillars round the surface. 552 is the design by J. J. Burnet, A.R.S.A.—a fine pictorial sketch in sepia; its characteristic appears to be the dominance of features borrowed from the old Scotch houses or Old Edinburgh architecture. It has the crow-stepped gables and other well-known features; but these are by no means employed to the exclusion of more modern details, without which people might suggest that it would be more at home at the south end of the new bridge. This design looks more picturesque with its variety of detail in the upper part than any of the others. 650 is the only remaining one, by Messrs. Dunn and Finlay. Its characteristic seems to be the endeavour, very successfully attained, to avoid anything like monotonous repetition of detail and that over-ornamentation of details of windows, &c., which, as in the successful design, is somewhat confusing to the eye of the observer. This design makes well-defined divisions in the façades, and so that the maximum of variety is attained on a site necessarily limited to an even boundary line, these divisions or projections are square on plan, and are relieved by arched recesses in the upper part. The sizes of the windows also are nicely proportioned to the importance of the various apartments, and there is perhaps more of the beauty of harmonious proportion of its parts in this than in any of the rest. 651 is a beautiful drawing in line of a design submitted by H. D. Barclay for the Glasgow Art Galleries. It shows a long building with fine central peristylar division, with the Greek Classical detail.

497, "Bargemen's Institute, Port Dundas, Glasgow," by J. Honeyman, R.S.A., and Keppie, is a plain edifice, but picturesquely arranged in its component parts. 507, "Queen Margaret College, Glasgow, Anatomical Department," by the same architects, is an amusing fancy sketch in what may be termed the impressionist style of etching. The artist is more in evidence than the architect, there being nothing particular in a building of much dead-wall surface and commonplace in its proportions. In the foreground is a vigorous etching of some exotic shrub, and many straight poles doing duty for the trunks of trees, the foliage being carefully shrouded with covering of nondescript material; whilst two lady students, with flowing garments, are walking gracefully over the demesne. 504, "Miss Cranston's Tea-rooms, Buchanan-street, Glasgow," by G. W. Brown, A.R.S.A., is a piece of Decorated street architecture, with one wide window and door on the ground floor, and finished on the top with a gable, in the Flemish style. 449 is a good water-colour sketch of the new Royal B. Hotel, Princes-street, by J. M. Henry. 463, "Design for Dumfries Academy," by J. A. Williamson, is a long building, with centre division and wings, in the Queen Anne style, and plentiful provision for light to the interior. 452, "Carnegie Public Library, Wick," by Leadbetter and Fairley, is a building erected on an angular site, with entrance-hall in the angle, and recreation-room, reading-room, and lending library ingeniously arranged in a triangle. The building is in a single story, and has good Classical details. Messrs. Leadbetter and Fairley send also their competitive design for the "Sandeman Public Library, Perth," also a Classical design, of much larger proportions. 470 is a design for a public hall, by T. R. Peacock, premiated, and with good proportions and details. 648 is a geometric elevation of the Polytechnic School, Battersea,

by J. A. Morris and C. A. de Boinville. It is a very long building, a monotonous unbroken line of circular-headed openings on the ground floor—a row of handsome workshops.

There is nothing of much architectural interest in the way of mansion houses, with the exception of an interesting bird's-eye view of "Earl's Hall, Fife," an old Scottish house which had laid in partly ruinous condition for many years, till restored by R. S. Lorimer, for the new proprietor, Mr. R. McKenzie. The sketch shows not only the house, but the adjacent grounds, including the large garden, now inclosed with ornamental wall and towers. This Scotch house still retains an old ceiling with decorated panels in colour, and is a very good example of the style. 457, "Johnstownburn, Haddington," is an old plain Scotch house, with additions made to it by Leadbetter and Fairley. The additions are shown on a miniature plan, and are very considerable, and made in good keeping with the style of the original. 459, "Hill House, Ayrshire," is another case of alterations and additions by the same architects, and 480, "The Holmes, St. Boswells," by the same architects, is a good vigorous etching of a mansion house recently erected. The elevation shows an entrance-porch in the angles, formed by a projecting wing, with pillars and entablature. The building has two floors, and is not lofty, with overhanging eaves and cornice on the main portion. 453, "Corbet House, Roxburghshire," by Hardy and Wright, the residence of A. Sholto Douglas, of Gateshead, is a building of two floors of considerable length, with details of the Scotch Baronial style in turrets and crowsteps, but without the altitude of the old Scotch house. 462, "St. Marnock's, Co. Dublin," is a large and peculiar building, the residence of J. Jamieson, D.L., by R. S. Lorimer. The whole of the edifice is severely plain both in plan and elevation. A plain parapet runs round the top, rather close to the upper windows, the segmental pediments being altogether on the parapet. It has the principal entrance at one end, and also a garden entrance in the centre of what would be called the principal front. A small plan shows the arrangement of the interior.

There are several examples of small country houses and suburban villas, but with nothing very noticeable in their appearance or details. There are some fine examples of the English cottage, half-timber style. 494 is a pretty water-colour sketch of design for Main Hotel and Club-house, by H. and D. Barclay; 508 is a pavilion for George Watson Club at Myreside, by Thomas T. Paterson. 454 is an hotel, erecting at Dunbar, by Messrs. Dunn and Finlay, in the Scotch style, with prominent angle-turrets, and a look of substantial provision for meeting all contingencies of that stormy coast.

There are some specimens of design for glass-staining. Of these, the most pleasing in design and colour are by Arthur L. Duthie, in his "Spirit of Romance" and "The Ten Virgins." "The Baptism" and "The Recording Angel," by W. Aikman, are far too green, and the figures have little character. Mr. T. Bonnar sends samples of decorated ceilings in water-colour.

#### OBITUARY.

MR. JAMES ABERNETHY, of Delahaye-street, Westminster, one of the engineers of the Manchester Ship Canal, died on Sunday night at his residence, Whiteness, Broadstairs, at the age of 81. He was a past-president of the Institution of Civil Engineers (which he joined so far back as March, 1844, and occupying the chair in 1881) and a Fellow of the Royal Society of Edinburgh. Mr. Abernethy had been failing in health for some time.

The Admiralty has sanctioned an improved scale of salaries to the engineering and constructive staff at the London establishment and at the dockyards (including those of Malta and Hong Kong). The officials listed receive a uniform advance of £150 per annum.

Mr. Bradshaw Brown, F.S.I., auctioneer and surveyor, of Vanbrugh Park, Blackheath, and Billiter-square Buildings, London, was thrown from his horse on Monday morning whilst out riding at Blackheath, and was killed. Mr. Brown, who was in his 46th year, was the surveyor to the Millwall Estate Office, was a member of the Shipwrights' Company, and was well known in City circles. He was an old contributor to our columns, and so recently as a fortnight ago we published a timely letter from him on "Riverless London."

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

THE BUILDING TRADES ASSOCIATION OF MANCHESTER AND DISTRICT.—The second annual meeting of this association was held on Wednesday week, the President (Mr. Robert Holland) in the chair. The annual report was read by the secretary, Mr. Fred Scott. It stated that the question of deposit of priced quantities had continued to occupy the attention of the council, and correspondence had passed between them and the council of the Society of Architects on the subject, with no practical result, however, and the question was now in abeyance. The council had passed the following resolution for the consideration of the several allied trades—viz., "That it be a general recommendation to the various trades to adopt for breakfast time 8.30 to 9 a.m. instead of 8 to 8.30 a.m." The council reported that a dispute between the master painters and their operatives had been satisfactorily settled by arbitration; and that, also, in respect of claims by the operative masons, the masters had made satisfactory arrangements. The treasurer's statement showed that the association was in a stronger financial position at the end than at the beginning of the year. The report and financial statement were adopted on the motion of the chairman, seconded by Mr. J. B. Kendall. Mr. Holland was re-elected president, Mr. G. Macfarlane vice-president, and Mr. J. Cantrill treasurer.

THE SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of the members of this society was held on Wednesday evening last, the 11th inst. A lecture on "Axiality" was delivered by Mr. Hugh Stannus, F.R.I.B.A., a native of Sheffield, now lecturer at South Kensington. The lecture, which was illustrated by numerous drawings and blackboard diagrams, was listened to with rapt attention by a very appreciative audience. A very cordial vote of thanks was passed to Mr. Stannus on the motion of Mr. J. Smith, seconded by Mr. Parkin, and supported by Mr. E. M. Gibbs, Mr. C. J. Innocent (hon. sec.), Mr. A. H. Holland, Mr. Buck, and the chairman.

#### CHIPS.

After prolonged litigation and negotiation the Corporation of Canterbury are taking preliminary steps towards the erection of an Institute from the proceeds of Dr. Beaney's bequest. They decided last week to purchase, as a site for the proposed building, the inns known as the Greyhound and the George and Dragon.

Southend Pier is already by far the longest in England, but it is to be made still longer. The Corporation of Southend have invited tenders for its extension about 150 yards seawards, and for the construction of a new pier-head.

At Christ Church, Linthwaite, on Saturday, a new three-light stained-glass east window was dedicated. It is the work of Messrs. Powell Brothers, Leeds.

The West Riding County Council have entered into a conditional agreement for the purchase of additional freehold land adjoining the Scalebar Park estate, and containing 21 acres, at a rate of £200 per acre, for the purposes of an asylum for private patients.

The will of the late Mr. George Culley Ashmead, land agent and surveyor, of Bristol, who died on October 2nd last year, has been proved by the executors—Mr. Frederick Ashmead (son), Mr. F. D. Ashmead (grandson), and Mr. W. A. Garaway (son-in-law). The gross personal estate amounts to £17,060 8s. 2d., and the net £16,768 15s. 9d. The gross real estate is £21,616, and the net £17,532 18s. 6d.

The Manchester Art Gallery committee have purchased for the permanent collection an oil picture, "The Pedlar," by Charles A. Collins, a son of William Collins, R.A.

The newly appointed hospitals committee who are concerned in the erection of a joint fever hospital, near Skipton, have decided to offer premiums for competitive designs, and to limit the outlay to £10,000, exclusive of land.

In the parish church of High Ongar a stained-glass window has been inserted in the south wall of chancel as a memorial. The artists are Messrs. Lavers and Westlake.

At a meeting in Dowell's Rooms, Edinburgh, on Thursday night, of architects' assistants, forming the newly-established Edinburgh Architectural Society, the president, Mr. A. R. Scott, delivered an address, entitled "The Grammar of Gothic Architecture." The lecture was illustrated by a large number of diagrams.



## Building Intelligence.

**BRISTOL CATHEDRAL.**—Under the presidency of the Mayor of Bristol a meeting was held, on Friday, at the Merchants' Hall in that city in support of the cathedral restoration completion scheme. His worship mentioned that £6,000 was required: £1,200 to clear off the debt for repairs already executed, £4,500 for external repairs to the north and south choir aisles, and their parapets and pinnacles, and the remaining £300 for a new doorway in the north transept, as designed by Mr. J. L. Pearson, R.A., architect to the Dean and Chapter. Speeches were made by the Bishop of the Diocese, the High Sheriff, the Dean, and others, and the sum of £1,115 were promised in the room. Reference was made to the recent death, at the early age of 28, of Mr. W. H. Cowlin, the head of the firm of contractors by whom the recent works of restoration have been carried out.

**HUNSTANTON.**—The memorial stone of the Town Hall was laid last week. Building operations have been in progress for a couple of months, and roof level has already been reached. The building has its principal front to the Green-gate-road, and another entrance from the Green, facing the ancient ruined cross and the pier. The total cost, including the furnishing, will be about £2,500. The town-hall is being erected from the designs of Messrs. George J. and F. W. Skipper, F.R.I.B.A., architects, of Norwich, whose plans were chosen in a limited competition some few months back. The walls are constructed of the local brown carr stone, relieved by windows and door-dressings of Monk's Park Bath stone. The roofs are covered with Broseley flat tiles. The style is Elizabethan. The large hall will be 77ft. by 37ft. 6in., and will have an open-timbered roof of massive principals; there will be a gallery at one end and a broad and deep platform or stage at the other end, provided with retiring-rooms. The windows will be mullioned and transomed, and the walls will have a dado of match-boarding to window height. The council offices will be approached by a side entrance in an octagonal annexe, and the council chamber will occupy the first floor. Adjoining it will be the clerk's office, and on the ground floor beneath will be the surveyor's offices, &c. The heating will be by hot-water pipes on the low-pressure principle. The contractor is Mr. Selden Hipwell, of Wisbech, and Mr. Walker, the surveyor to the council, acts as clerk of the works.

**OLTON.**—The ceremony of consecrating the transepts and nave of St. Margaret's Church, Olton, which has recently been enlarged, was performed on Tuesday by the Bishop of Worcester. The first portion of the church, which consisted of a chancel only, with a small temporary addition, was opened on December 14, 1880, and the interior was arranged so as to seat very closely 200 persons. After fourteen years it was decided to complete the transepts and nave, whereby accommodation would be provided for about 450 persons. The total cost has been £3,400, including £256, the outlay necessary to make a new road as a substitute for a disused lane running across the site. The church is now a characteristic example of the English Gothic style, and a spire will be added at some future date. The walls of the church are faced on the outside with Codsall stone, and Bath stone has been employed for the finishings around the doors and windows. The nave is 75ft. long, the width, including the aisles, is 49ft., and the nave roof, which is open-timbered, is 42ft. in height. During the process of enlargement several stained windows have been added, including one designed by Messrs. Ward and Hughes, in the chancel, and one on the south side, designed by Messrs. Camm Brothers. The building operations have been carried out by Messrs. H. Willcock and Co., of Wolverhampton, from the designs, and under the supervision, of Mr. B. Corser, architect, Colmore-row, Birmingham.

**MR. R. G. O'SHAUGHNESSY, M.S.A., A.M.I.C.E.,** the engineer of the Hesseraghata Waterworks for Bangalore, has been specially selected to act as irrigation engineer under the Government of Perak. The scene of Mr. O'Shaughnessy's work will be the Province of Krian, the irrigation proposals for which were lately reported on by Mr. Claude Vincent, whose services were placed at the disposal of the Colonial authorities by the Government of India for that purpose.

### TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

### SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

### NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—L. T. Barker and Sons.—F. J. W.—C. R. and Co.—W. E. (Newark).—J. Andrews.—W. T. B.

### "BUILDING NEWS" DESIGNING CLUB.

#### SIXTH LIST OF SUBJECTS.

G.—A Block of Stables and Cow Standing, adapted for erection in connection with a small country-house in a stone district. Provide five stalls, two loose-boxes, a washing-standing, harness-room, and man's bedroom over it; a coach-house for four carriages, and a hay and corn loft. The cowshed for four cows and a small calf-standing to form part of the quadrangular block of buildings, and a small stock-yard attached to it looking away from the stable yard proper, and towards the paddock. The buildings to occupy three sides of the little quadrangle. Slate roofs, and stone walls. Scale, 8ft. to the inch, and plans may be drawn 16ft. to the inch; view essential. Site a level one, facing south.

DRAWINGS RECEIVED.—"Mac," "Demetrius" (no name and address), "Punt," "Thrush," "Thistle" (no name and address).

## Correspondence.

### AN ARCHITECT'S SECRETAIRE.

To the Editor of the BUILDING NEWS.

SIR,—You print this week a set of drawings for an architect's secretaire and arm-chair, and in your notice of the same you congratulate the designer on having designed a secretaire adapted to the requirements of an architect.

If you can spare a few lines of your valuable space, I would like to point out why, possibly, a large number of your readers might disagree with your opinion. We will suppose that our architect sits down in the undoubtedly comfortable and useful arm-chair and places his elbows on the fall-down lid. Preparatory to acknowledging the receipt of his commission he is suddenly reminded that this piece of furniture is constructed of some "hardwood"—walnut, for instance—as the secretaire, being only 16in. from back to front and nearly 5ft. high, with all the weight in the upper portion, at once overbalances, hitting the unfortunate architect badly on the head. If he decides to use this desk again, a joiner is first

called in to fix angle-iron holdfasts with which to attach the secretaire to the wall—a proceeding not anticipated by the designer, probably. I consider the fault would have been reduced had the lower portion bounded by the four legs been occupied by a cupboard kept filled with heavy books—volumes of the BUILDING NEWS, for instance.

I have nothing to say against the pleasing appearance of the secretaire, but am speaking only of its merits as a useful adjunct to an architect's office furniture. With apologies for thus trespassing on your space—I am, &c.,

E. H. WOODCOCK.

83, Wellington-street, Alexandra Park,  
Manchester, March 7.

### FINISH FOR OAK.

SIR,—I, for one, am obliged to Mr. Stevenson for his valuable information on above, which appears in this week's issue; but I fail to see how beeswax and turps can be applied to work which is covered with carving, for it is impossible to "trush well in," and equally so to well rub and polish with clean white cloths. Mr. Stevenson doesn't say why he finds oiling unsatisfactory, and I fail to see why friction is to be used frequently. In my case the slight coat of oil I gave soon dried in, but leaves the work with a nice dark look, and I hope it will not prevent the wood darkening with age to that beautiful brown colour seen in old oak chests, &c. I have an oak door in one of my sitting-rooms which is polished inside, and outside—that is, on the weather side—merely has a coat now and again of linseed oil. It is quite a dark brown now, and has only been up about eight years.

In our village church we have an oak pulpit and other work, done some six or eight years ago. It was, of course, left in its natural colour, as most ecclesiastical work is, and to-day it looks very much as it did on the day it was completed—viz., raw and unfinished. There is evidently some chemical matter in the air which acts on the wood and turns it brown through time, and what we want is to find out what it is, so that we can apply it at once, and get the work of years in as many moments.—I am, &c.,

JAMES COOPER.

Killerby Hall, Scarborough.

### WRONG ADDRESS.

SIR,—By an oversight in your last week's paper I find Messrs. Young and Hall's address has been incorrectly stated as in Doughty-street, and I have in consequence been inundated with circulars. I shall feel obliged if you will kindly correct this mistake, as it is no doubt as inconvenient to Messrs. Young and Hall as to myself. I have been here for 23 years, and have no intention of leaving at the present.—I am, &c.,

HENRY HALL.

19, Doughty-street, Mecklenburg-square,  
London, W.C.

[Our own mistake—caused, curiously enough, by a *lapsus calami* made in the very act of verification!—Ed. "B. N."]

### CHIPS.

The new pier at Bangor, now in course of construction from plans by Mr. J. J. Webster, C.E., will be formally opened by Lord Penrhyn on May 14.

On the recommendation of the Highways Committee, the London County Council have agreed to purchase for £2,000 the Highgate Hill steep-grade tramways, which will be put into working order at a further cost of £3,000.

In the course of the lecture he gave on Wednesday evening in last week, at Carpenters' Hall on "Electricity in Connexion with Building," Mr. W. H. Preece, C.B., said that at the present time there was practically no difference between the cost of electric light and gas. The cost of the production of electricity, however, was being reduced, and the time was not very far distant when it would be cheaper than gas.

A quantity of Roman pottery, including cups, bowls, paterae, and amphorae of Samian ware, has been found during excavations for stone on the Gippeswyk Hill Farm, near Ipswich railway station.

The enlargement of St. Mary's National Schools, Monmouth, has been entrusted to Mr. G. E. Halliday, architect, of Cardiff. The so-called "Jefferies window" will in no way be interfered with.

A Victoria Hall and Gordon Institute have just been built at Ballater, from plans by Mr. William Duguid, of that town. The buildings adjoin Albert Institute, and are faced with red and white granite. The hall is seated for 500 people, and occupies the west wing of the edifice. The total cost has been £2,500.



## Intercommunication.

### QUESTIONS.

[11484].—**Permanent Covering to Roofs of Stands on a Cricket Ground.**—Will some reader kindly inform me the best kind of permanent covering to stand through both summer and winter? *Hos. Sec.*

[11485].—**Conditions of Contract, &c.**—Perhaps some Fellow or Associate of the R.I.B.A. would kindly inform me, either through this medium or by correspondence, (1) how the form of contract, as issued by the R.I.B.A., is, or may be, adapted or modified to suit contracts in Scotland, considering that in England, as a rule, one contractor undertakes, and is responsible for, all trades, whereas in Scotland (as far as I have experienced) there is one contractor employed and held responsible for each of the various departments? (2) Are there any publications relating to right of light, air, boundaries, and dilapidations, or books on measuring and valuation of buildings such as are to be found in England, as I believe Scots law differs in many points to that of England? Perhaps either C. J. McLean, Glasgow, or J. J. Henderson, Dundee, may favour with a reply.—A.R.I.B.A., England.

[11486].—**Books.**—What are the best books for a young architect to consult (1) with regard to laying out a building estate, and (2) as to whether there is any information to be obtained about cemeteries and their chapels, &c. *SAXON.*

### CHIPS.

The accident to Mr. Alfred Button, builder, of Southampton, only child and junior partner of the ex-mayor of Southampton, terminated fatally on Wednesday week. Mr. Button, while inspecting an ice factory at Southampton, fell through an unnoticed trap-door, fracturing his spine, and lingered on in a helpless condition for several weeks. He was but 34 years of age, and leaves a widow and one child.

A new board school, on the Bradford and Wakefield-road, West Ardsley, was opened on Tuesday week. The school, together with master's and caretaker's houses, has been erected from plans prepared by Mr. A. Fawcett, C.E., Wakefield, at a cost of about £7,000.

At Ford End, Great Waltham, Essex, a mission-church seated for 80 people has just been opened. Mr. Millbank, of Great Waltham, was the builder.

The Colne Town Council have secured a site in Brown-street, near the railway station, on which they purpose erecting a technical institute.

The town council of Longton, Staffs, decided, on Friday, to authorise a committee to prepare a scheme for the erection of a free library and technical schools, and to report thereon.

The town council of Perth considered, on Friday, the erection of the new free library. The architect's report showed that the total of the lowest tenders for the building was £13,112 1s. 7d.; but in alternative offers for the erection, many of the items had been specified subject to further alterations in quality of stone, &c. The net cost of the library building would be £12,868. The expense of stocking the library was calculated a little over £2,000. The funds available amounted to £31,470. The recommendations were referred back to the committee.

The Oldham Corporation decided, at their last meeting, to raise the salary of Mr. A. Andrews, superintendent of the gas and water works departments, from £280 to £330 per annum.

The 85 topographical drawings of Old Liverpool, executed between 1832 and 1840 by the late William Gawin Herdman, were sold by auction at Liverpool on Friday, and fetched £960, being purchased by Mr. Foster, a local colliery proprietor. The collection cost the late owner, Mr. A. J. J. Bamford, £1,000.

The Monmouth School Board have adopted the plans of Mr. G. E. Halliday, of Cardiff, for their new infant schools at Overmonnow, Monmouth.

Seventy plots of freehold land on the Roundwood Park Estate, Willesden, were sold by auction on Tuesday, the price realised being nearly £3,000, or at the rate of £1,300 per acre.

At the last ordinary meeting for the session of the Sheffield Society of Architects and Surveyors, held on Wednesday evening, a lecture on "Axiality" was delivered by Mr. Hugh Stannus, F.R.I.B.A., of London.

A museum, hall, and gymnasium, with classrooms and dispensary, are about to be built at Lady Wood, near Birmingham, from plans by Mr. J. Hall Gibbons, of City-road, Birmingham.

At Sheffield, last week, Lady Alice Fitzwilliam unveiled the memorial bust of the late Archdeacon Blakeney, vicar of Sheffield, which has been placed in the parish church. The bust, which is of white marble, is the work of Mr. Onslow Ford, R.A., and it has been placed on the north side of the apse, in the next vacant panel to that which contains the bust of the late Archbishop Thomson.

## Legal.

### RAILWAYS AND ANCIENT LIGHTS.

A VERY important and general question was raised recently in the case of "Eversley v. North-Eastern Railway" (*Times*, Feb. 21). The facts were not in dispute. Plaintiff was the owner of some undoubtedly ancient lights at Leeds, which would be darkened by a parcels office which was being erected by the defendant company under their statutory powers. He now sued for an injunction and damages. Mr. Justice North had decided against the plaintiff on the broad ground that, as the defendant company were entitled to erect their new building by their statutory powers, the plaintiff's remedy was not by an action for damages or an injunction, but by a claim to compensation under the Lands Clauses Act of 1845. The clause under which he so held is clause 5 of Section 16 of the statute, which gives such a company power from time to time to alter, repair, or discontinue their works, or any of them, or to substitute others in their stead. The company were, in fact, rebuilding a parcels office, upon their own land, and by extending and enlarging it generally, they were reducing the light hitherto enjoyed by the plaintiff, and for which he now sought, at all events, damages, if not an interlocutory injunction, which he had applied for in the first instance.

Upon the appeal, Lords Justices Lindley, Kay, and A. H. Smith agreed in confirming the decision of the Court below, though for somewhat different reasons, thus showing the difficulty of the various questions involved. The result in the end was to dismiss the appeal with costs, and send the plaintiff for his remedy to a claim for compensation under the Lands Clauses Act, 1845, the whole of these proceedings being wasted, as far as he was concerned, although, of course, the decision remains as a leading authority, and a guide to others similarly situated. This is a very strong ruling in favour of the principle that the remedy must be sought through the statute, because it was not an instance of a new building, or even of building upon land lately taken; but it was, in fact, a rebuilding and extension of a structure upon ground that had long before been acquired by the company.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

The Government intend to introduce a Bill for the creation of a new trust, whose duty it will be to consider the question of the water supply of the Metropolis, and later on to promote Bills in Parliament either for the transfer of the existing undertakings to itself, or for the more effective control over the water companies.

At a meeting of the Royal Scottish Academy, held in Edinburgh on Tuesday, the resolution which was passed last week to elect four painters to the rank of Associate was confirmed. The election will accordingly take place next Wednesday.

The Arbroath Police Commissioners considered, on Monday, the proposed extension of the underground water-supply of the town. In accordance with a report by Mr. McCulloch, C.E., Edinburgh and Dundee, it was resolved to add to the supply by sinking a well or shaft on the lands of Warslap with an adit extending 100yds. east and 100yds. west, and to connect the new works with the present pumping station, which is to be retained.

The new parish church of All Saints, Hove, for the completion of which appeals are being made, is being built in sections, from designs by Mr. J. L. Pearson, R.A. The total expenditure upon the church up to the present time has been over £19,200. The tower will be built some future day, and that will cost £9,000. But the section now in hand is the building of the eastern part of the church. It will include the *quasi*-transept to make the church cruciform; the two bays behind for the choir, and the sanctuary for the clergy; and a chapel on the south side for the daily services, for which chapel an offer of an altar has already been made. On the north side there are to be the vestries, with a large room over for parochial purposes, and under the eastern portion of the church another large room for Bible-classes, and other accommodation. The total expenditure contemplated will not be less than £18,000, and if to that be added the £19,000 already spent, a total of £37,000 is arrived at, or a deficiency of £15,000.

### LEGAL INTELLIGENCE.

**CORK MUNICIPAL BUILDINGS. ARCHITECT AND CONTRACTOR SUED BY THE CORPORATION.** In the Queen's Bench Division, Dublin, on Saturday, before Mr. Justice O'Brien, Mr. Justice Holmes, and Mr. Justice Gibson, in the case of "The Corporation of Cork v. Fitzgerald and M'Mullen," Mr. D. B. Sullivan, Q.C., applied on behalf of Mr. Edward Fitzgerald, one of the defendants, to have the venue in the action changed from the city to the county of Cork. The action was brought against Mr. Fitzgerald and Mr. Michael Joseph M'Mullen, who were sued for £8,000 each, in connection with the erection of the Municipal Buildings in Cork. The action against Mr. Fitzgerald was for breach of contract, he being the contractor for the erection of the building. The action against the other defendant was for negligence, as city architect, in connection with the preparation of the plans. The Court refused the application.

**METROPOLIS MANAGEMENT ACT APPEAL.—LONDON COUNTY COUNCIL v. PRYOR.**—(Court of Appeal, March 4, before the Master of the Rolls, Lord Justice Lopes, and Lord Justice Rigby.)—This was an appeal from the judgment of the Divisional Court upon a case stated by a Metropolitan police magistrate as to whether a certain building in Prince George's-road, Stoke Newington, came within section 74 or section 75 of the Metropolis Management Act, 1862. If it came within section 74 compensation would have to be given for setting back the building to the general building line; if within section 75, a demolition order might be made. The facts stated in the case were as follows:—In April, 1895, Pryor was summoned on the ground that, on October 20, 1894, at the northern end of Prince George's-road, Stoke Newington, he did unlawfully begin to erect a certain building beyond the general line of buildings without the consent of the London County Council, contrary to 25 and 26 Vict., c. 102, section 75; 45 and 46 Vict., c. 15, section 10; and 51 and 52 Vict., c. 41. It appeared that on October 20, 1894, Pryor, who was a builder, began to erect in Prince George's-road for Mr. Hicklin, the owner of the site, a certain building. The superintending architect to the London County Council, by his certificate, dated January 22, 1895, decided the general line of buildings in Prince George's-road, and decided that the said building was in the said road. Mr. Hicklin appealed to the tribunal of appeal constituted under section 28 of the London County Council (General Powers) Act, 1890, and section 175 of the London Building Act, 1894. Pryor was not a party to the appeal. The tribunal of appeal confirmed the certificate of the architect so far as it related to the general line of buildings on the northern side of Prince George's-road, and determined that the house in question was on land within the exceptions in section 33 of the Act of 1890, such land being the sites of buildings and land held with buildings existing at the time of the passing of that Act. Prince George's-road ran at right angles to Stoke Newington-road. Previously to 1890, when Prince George's-road was laid out and made, there had been a row of houses, Nos. 68-85, Stoke Newington-road, having forecourts in front between them and the Stoke Newington-road and gardens at the back. In order to make a space for Prince George's-road the house No. 81, Stoke Newington-road was pulled down. The houses 83 and 85, Stoke Newington-road remained standing at the time the magistrate heard the summons. The forecourts to them were about 40ft. in length. The building in question when completed, would be situate upon a part of the forecourt of No. 83 and upon the whole forecourt of No. 85, and upon part of the gardens of Nos. 83 and 85. By a certificate dated December 21, 1894, the superintending architect fixed the general line of buildings in Stoke Newington-road, and the building in question was within such line in Stoke Newington-road. The said building begun to be erected by Pryor was 7ft. beyond the general line of buildings in Prince George's-road. No consent was given by the County Council to the erection of the said building. Pryor contended (so far as material to this appeal) that the said building was exempt from the requirements of section 75 by reason of the facts being indistinguishable from those in the case of "Lord Auckland v. Westminster District Board of Works." The magistrate held that the facts were indistinguishable from those in Lord Auckland's case, and dismissed the summons. The Divisional Court (Mr. Justice Lawrance and Mr. Justice Collins) held that Lord Auckland's case was not applicable, and remitted the case for the magistrate to deal with. Pryor appealed, but the Court now dismissed the appeal. The Master of the Rolls said that, in his opinion, the magistrate had made a proper special case; he found all the facts, and asked the Court to decide whether the facts so found brought the present case within the principle laid down in Lord Auckland's case. The question was whether on the facts the surveyor had jurisdiction to give a certificate as to the building line of a certain street. There was an old street or road, and it was desired to open a new street to join the old street at right angles; and the question



was whether the surveyor had a right to do what he did with regard to the new street. In the new street there were some old buildings, and beyond the old buildings there were a sufficient number of houses building to enable the surveyor to determine a building line. When that line was laid down one of the old houses advanced beyond it, but it had since been pulled down. The builder claimed the right to build on the site of that old house, and also to build on each side of that site, though the new houses which he so built came beyond the line. On the other hand, it was said that he had abandoned the old house and thrown the site into the street, and that the street had become absolutely a new street, and that if he built he must conform to the building line. The facts in Lord Auckland's case were different. There the owner of a house, which had a plot of land adjacent to it, pulled it down and claimed the right not only to rebuild on the site of the old house, but also to build on the plot of land; and the Court held that he was entitled to do so, on the ground that the plot of land was part of the curtilage, and, therefore, in law part of the house itself. In the present case the old house had a forecourt on one side of it and a garden on the other side. They were clearly not part of the curtilage, but were mere land, and the Act did not give the right to build on land which was not part of a house. The answer, therefore, was that this case was not within the principle of Lord Auckland's case. Section 74 did not apply, and there was nothing to prevent the surveyor from certifying the building line as he had done. The Lords Justices delivered judgment to the same effect.

**MASONRY MEASUREMENTS.**—At the Sheffield County Court, on Feb. 19 and 20, Judge Ellison heard a case of interest to builders and quarry owners, the principle involved being that of the custom in the trade of measuring "through" rockies. The plaintiff was Joseph Turner, quarry owner, of Middlewood, and he sued Charles Glossop, of 121, Hadfield-street, Walkley, for the sum of £25 4s. 4d., balance of account for the supply of stone for a house at Grindleford; £21 had been paid into court. The plaintiff said he charged the defendant 20s. a rod for rockies, and it was usual to have one "through" for every square yard. He contended that the rule to measure "through" was double on the face. Mr. George Carr said there were two ways of measuring "throughs,"—one by means of measuring the face double, and the other by measuring the face and the joint, which was more favourable to the quarryman. The other witnesses for the plaintiff were Messrs. John Catchpole, Darnall; Mr. Thomas Allsopp, Bakewell; Mr. Henry Mitchell, Mr. Wilfrid Wayn. The defence was that the rockies should not be charged twice when the "throughs" only numbered one to every square yard. The defendant said on measuring up his building he found 26 yards of rockies short. When at the plaintiff's quarry he saw the rockies set up on end, and he asked the plaintiff's foreman if he had measured them that way. An affirmative reply was given, and the defendant replied it was no wonder there was a discrepancy between the delivery tickets and the amount delivered. Evidence was given to the effect that it was the custom to measure all stones as "rockies," and not "throughs." His Honour reserved judgment.

**WORKHOUSE ADJUNCTS AND THE BUILDING ACT.**—At North London Police-court on Tuesday, the Hackney Board of Guardians were summoned, at the instance of Mr. Frederick Meeson, district surveyor for Hackney, for using Nos. 24 and 25, Sidney-road, Homerton, as a public building—viz., as the married couples' quarters of the workhouse—the district surveyor not having declared his approval of the construction of the said buildings. Mr. Jutsum, solicitor for the district surveyor, explained that the Hackney Board of Guardians had occasion to provide quarters for a number of aged married couples, and they purchased two houses adjoining the workhouse in Sidney-road, Homerton. They made alterations and caused the buildings to be occupied. Mr. Meeson served the guardians with a notice, but the guardians did nothing, and when Mr. Meeson visited the buildings in February, he found the houses occupied by 14 persons. The staircases were made of ordinary deal (quite unfit for a public building) and the walls were only 9in. thick and considerably bulged. The facts were not disputed. The sole point which arose was whether the conversion had turned the houses into a public building. Mr. Ryde argued to the contrary, and pointed out that the aged couples might have been lodged out separately. Could it then have been said that each house in which a pauper couple resided was a public building? Mr. Paul Taylor: Certainly not; but in this instance the building adjoins the workhouse, and is really part of it. Mr. J. Mason, the master of the workhouse, said that at present there were 16 paupers and two attendants in the houses. In his opinion, the number of inmates, if the houses had remained as ordinary private houses, would have been much greater. By the magistrate: The additional buildings were part of the workhouse and under the rules

and regulations of the Local Government Board. Mr. Alex. Finch, architect to the guardians, said that the alterations had been carried out with a view to insuring the safety of the inmates from fire. In the course of further argument Mr. Ryde quoted the case of "Joslyn v. Meeson," in which it was held that an ambulance station erected in connection with Homerton Fever Hospital was not a public building. Mr. Paul Taylor said the Act stated that a workhouse was a public building, and it seemed to him that this building was a wing of the workhouse. Mr. Ryde said if that was the magistrate's view he asked for an adjournment in order that the guardians might apply to the London County Council to license the building, and thus exempt it from the provisions of the London Building Act. As a matter of fact the County Council were of opinion that this was not a public building within the meaning of the Act, and they had withheld the license until the magistrate had decided the point. Mr. Paul Taylor said he felt bound to find in favour of the district surveyor, and he imposed a penalty of 1s. on each of two summonses which had been taken out. As, however, counsel for the guardians had waived a technical objection to an informal notice, which must have been fatal to one of the summonses, he refused to allow costs.

### CHIPS.

In the annual report laid before the Teignmouth District Council last week by Dr. Piggott, as medical officer of health, it was stated that in 1889 the local authority purchased an asphyxiator, and since then the smoke test has been applied to the drains of 465 houses, of which no fewer than 433 were found to be defective. This is fairly strong proof of the importance of the systematic house-to-house inspection of all dwellings. It is not to be wondered at that the lodging-house keepers of the town strongly object to the application of the smoke test to their premises.

For the ventilation of the Royal Irish Constabulary Depot, Phoenix Park, Dublin, the "Climax" patent direct-acting turret ventilators, design F, have been used and supplied by Messrs. Cousland and Mackay, ventilating engineers, Glasgow, the sole manufacturers of these ventilators.

The new church of St. Nicholas, Kelvedon Hatch, Essex, has been opened. It is Early English in style, and is built of red brick, with red-tiled roof, with an oak spire, containing one bell, over the porch. The church seats 250 persons, and replaces, in the centre of the village, the chapel-of-ease a mile and a half distant.

The official estimate of the population of West Hartlepool is now raised to 52,000—apart from the sister borough near it. Its growth is increasing in rapidity, for the West Hartlepool Council last week passed plans for more than 100 additional houses.

The urban district council of Colwyn have adopted plans by their engineer and surveyor, Mr. William Jones, for a sea wall and promenade to be constructed at Colwyn Bay.

Mr. J. Passmore Edwards will open the new free library at Falmouth, bearing his name and built at his cost, on Friday, April 24, or May 1.

The Duke and Duchess of York will visit Halifax on Wednesday, July 22, for the purpose of formally opening the new infirmary at Heath, which has been built at a cost of £80,000. The building, which is Free Renaissance in style, has been erected from plans by Messrs. Thomas Worthington and Son, of Manchester, selected in July, 1890, in a limited competition.

A new Congregational church in Plashet Park, East Ham, has been opened. It is Gothic in style, consists of a nave and aisles, and cost £2,300.

The Leeds City Council agreed to purchase on Wednesday week three shops, warehouse, and stabling, on the east side of Vicar-lane, opposite Lowerhead-row, for £6,638 10s., and two houses and a shop, in North-street, for £2,325. These premises are required for the York-street and Vicar-lane improvement.

Mr. Clegg Wilkinson has just painted a portrait of the late Mr. J. Frederick La Trobe Bateman, past president of the Institution of Civil Engineers, which has been presented to that institution by the Hon. R. C. Parsons.

The Belfast City Council are about to carry out a section of their waterworks scheme from plans by their engineer, Mr. Macasey, M.Inst.C.E. The works consist of a portion of the main conduit, a little over 11 miles in length. The intended conduit, which will be wholly situate in the county of Down, will consist of tunnel, cut and cover, and cast-iron and steel siphon pipes. The terminal points of the works will be situated, roughly speaking, some 3½ miles and 7½ miles respectively in a direct line from the railway station, Newcastle.

Mr. William Pinkerton has been appointed town surveyor of Larne by the public commissioners of that town.

## Our Office Table.

MR. F. C. PENROSE, F.R.S., P.R.I.B.A., left London for Athens on Tuesday, having been appointed by the Government of Greece one of the three members of the International Commission of Architects who are to inspect and report upon the repairs required at the Parthenon in consequence of the earthquake of 1894. Mr. Penrose expects to be absent from England about two months. His colleagues on the commission are Dr. Josef Durm, of Karlsruhe, and M. Magne.

At the National Gallery a fresh picture, "The Crucifixion," by Spinello Aretino (1333-1410), of the Tuscan school, has been hung at the north-west corner of the vestibule at the head of the principal staircase. It has been bequeathed by the Rev. Dr. Jarvis W. Ash, of Tunbridge Wells, is numbered 1468, and is the fifth example in the collection by this noted frescoist. The painting measures 4ft. in height by 3ft. 9in. wide, and is inclosed in a heavily-gilt frame, having above it a projecting carved canopy and pinnacles. The picture itself is in a high scale of colour, the background being gilded. The subject is the three crosses, and hovering around the central one, on which hangs the dead Christ, are angels, three of whom are catching in shallow golden vessels the blood issuing from His nailed hands and pierced side. In the foreground are the Holy Women and St. John, disciples, Jews, and Romans; while behind are numerous soldiers on horseback, each raising a crimson banner, inscribed "S. P. Q. R." In panels at the side are the full-length figures of four saints, and in the predella are five circular medallions, that in the centre containing a representation of the Madonna and Child, with figures of St. Helena and St. Francis on the left and St. Anthony and St. Catherine on the right. Mr. Henry J. Pfungst has presented a picture of still life, by Willem K. Heda (1594-1679), a contemporary and follower of De Heem. This was hung on Wednesday afternoon in Room No. XI., and is numbered 1469. A small picture of a battle-scene, by Jacob Weier, a little-known German painter of the school of Wouverman, has been given by Sir Augustus Franks. It will be hung shortly among the Dutch pictures. Neither of the two latter were previously represented at the National Gallery.

ABOUT two years ago the Corporate Property, Charities, and Endowments Committee of the London County Council were instructed to prepare a ground plan showing the freehold owners of houses and vacant land in the county of London. They now report that up to the present a total of 651 estates have been defined upon the sheets, and that 290 are in hand. The area already covered represents about two-fifths of the total acreage of the county of London. The refusals to supply information in connection with the plan received from the commencement of the work are 96, a number which compares very favourably with the number of estates dealt with. In the majority of these cases where information has been refused, owing to the Council's not being prepared to pay professional charges or for other reasons, it has been obtained in a variety of ways. Thus the number of refusals must not be regarded as indicating that the information desired will not be forthcoming from other sources. Moreover, the committee believe that the refusals must not in some cases be treated as final or definite. At a future date the refusals will receive such attention as may be considered necessary to make the plan complete. Basing his calculations on the work of the last nine months, the value to the County Council is of opinion that the total cost of the plan will be about £4,000, including the £900 which has been already expended.

A LECTURE on the tunnel under the Thames at Blackwall was delivered at the Royal Institution on Friday evening by its engineer, Mr. Alexander R. Binnie, M.Inst.C.E. He spoke of the tunnel as one of the most difficult engineering works that have been carried out in London during the past 50 years, and, after dealing with the peculiar circumstances surrounding the problem, proceeded to describe the work itself and the means adopted by Messrs. Pearson, the contractors, in constructing it, glancing at the history of the subject, and at the physiological effects produced by the use of compressed air. The plans, he explained, were prepared by himself in conjunction with Sir Benjamin Baker and Mr. J. H. Greathead: the work was commenced early in 1892,



and the tunnel will be opened next year. So far no fatal accident has occurred among the men at work there, and only one man has been temporarily disabled. The tunnel will have a roadway 16ft. wide, and two 3ft. footways, and will be illuminated throughout by three lines of incandescent electric lights placed 10ft. apart.

Mr. ARTHUR CATES has tendered his resignation of the post of chairman of the Board of Examiners in Architecture, on account of his health. The news will be received with great regret by all architects, for, as the *Institute Journal* remarks, during forty-one years Mr. Cates "has devoted his time and labour to the furtherance of the scheme, and the firm basis upon which it is now established is undeniably due to his untiring effort in its behalf." Since the establishment of the obligatory examination for Associates, fifteen years ago, the Board of Examiners have annually shown their sense of Mr. Cates's great services by re-electing him as their chairman.

Dr. OHNEFALSCH-RICHTER delivered one of a short course of lectures on Tuesday at the Imperial Institute, on the excavations in Cyprus before and after 1878. Field-Marshal Sir J. Lintorn Simmons was in the chair. The lecture was illustrated by hitherto unknown, or very little known, monuments stored in the Cyprus Museum. Dr. Ohnefalsch-Richter, who exhibited works of plastic and fictile arts of all descriptions, articles of gold, silver, engraved stones, objects in iron, copper, bronze, glass, and other materials, sketched the whole development of art and civilisation in Cyprus from the earliest beginnings, about 4000 B.C., down to the Byzantine era. He showed that the Early Copperage civilisation had its origin in Cyprus, and that from there this civilisation wandered also to the west and north to Great Britain and Ireland. The contrary theory, that this civilisation originated in the north and wandered to the south and east, still maintained by many savants, like M. S. Reinach, must be abandoned. An unbroken chain of development was shown from one layer to another. After the most primitive time, well known now from Dr. Schliemann's discoveries at Hissarlik-Troy, we saw the Mycenaean period, so called from the first finds made in Mycenae. Then we arrived at the Græco-Phoenician time, when iron first appeared in the graves, and it was shown what a great influence the ancient Cypriotes exercised on the formation of the Greek archaic art. Then the lecturer entered the dominion of Greek, Hellenistic, and Roman art, and closed his sketch of ancient culture with pictures of some valuable Byzantine remains, especially an interesting little gold treasure, now in the Cyprus Museum. Researches were made in 1894-95 on the Eastern Acropolis of Idalion, where valuable antiquities of the 5th, 6th, 7th, and 8th centuries B.C. were built into fortifications erected about the 4th century B.C.

According to Dr. Shaw, statistics show that the population of America is largely centred in cities. While at the beginning of the century only 3½ per cent. of the population resided in cities, nearly 33½ per cent., or ten times as much, were found living in cities in 1890. The agencies of civilisation are tending towards greater centralisation, and to the ministering to large masses in groups. The same writer acknowledges the lead in healthiness and comfort of European cities. America began to think of sanitary laws and regulation long after many of the great Continental cities, but is now making rapid strides, and framing municipal by-laws and regulations. The same writer says epidemics of disease are rarely heard of in the large cities of the West, yet we do not think even New York or Chicago can show a lower death-rate than London.

The business of the Prudential Insurance Company still advances by leaps and bounds. The Ordinary Branch shows a total premium income during 1895 of £2,304,013, or an increase of £226,057 over that of the preceding year, while the industrial premiums received were £4,352,625, or £108,401 more than in 1894. The claims paid during the year totalled £1,797,688. The total number of policies in force at the end of 1895 was 11,682,748, so that it would appear that more than a third of the population is insured in the Prudential! The assets reach the vast total of £23,915,890 3s. 11d.

SOME time ago, Richard Smith, a wealthy type-founder of Philadelphia, bequeathed to that city the sum of 500,000dols., to be expended upon a gigantic monument to himself, to be erected in

Fairmount Park. The Park Commissioners have decided to accept the bequest, and the memorial is to be erected as the donor wished. It will consist of a central tower, surrounded by pedestals, on which are to be set statues of distinguished persons, mostly Pennsylvanians. Among these are to be commemorated Generals McClellan, Hancock, Meade, and Reynolds; and bronze busts of Governor Curtin, Generals Hartranft, Beaver, and Crawford, Admirals Porter and Dahlgren, Mr. John B. Gest, the executor of the estate, and Mr. James H. Windrim, the architect of the memorial, are to be provided. Near the entrance door is to be a statue of the donor.

#### CHIPS.

Mr. Hall Caine is having his new residence, Greeba Castle, in the Isle of Man, repaired and improved from plans and designs furnished by Mr. Baillie Scott.

At a recent meeting of the Chapter at Southwell Minster, the Bishop stated that £150 was available for providing a pulpit in the choir, being the amount assigned for that purpose by the Ecclesiastical Commissioners. It was agreed that the architect to the Commissioners, Mr. W. D. Caroe, should be asked to furnish a design.

At the Guildhall, Bath, on Friday, Mr. F. H. Tulloch, an inspector of the Local Government Board, held an inquiry respecting the application of the town council for power to borrow £6,700 for the extras incurred on the new municipal buildings. The deputy town clerk said that the original loan applied for was £31,500, and an inquiry was held before the late Mr. S. J. Smith; the loan was granted for 30 years. In Mr. Smith's report the original items were given as follow:—Cost of building, £22,500; purchase of leasehold property, £3,000; furniture, £3,000; architect's commission, £1,125; and contingencies, £1,875. Mr. Watts gave the actual cost against these items.

The parish church of St. Bride's Minor, Glamorgan, is about to be enlarged from the designs of Mr. G. E. Halliday, diocesan surveyor for Llandaff. The cost will be defrayed by Mr. Llewellyn, of Baglan Hall, Briton Ferry, Glamorgan.

A girls' lodging-home was opened on February 20 last, in connection with the Girls' Institute, Mill-street, Ancoats. The new home furnishes accommodation for 12 girls and a matron, with four bedrooms and a sitting-room for workers in the institute. The cost of building and furnishing the home is about £1,090. The architects are Messrs. Horton and Bridgford, F.R.I.B.A., of Temple Chambers, Brazenose-street, Manchester; and the contractors Messrs. Burgess and Galt, of Upton-street, Ardwick.

The parish church of St. Thomas, Brentwood, which was rebuilt a few years since from designs by the late Mr. E. C. Lee, has been beautified by the addition of a reredos, erected in accordance with a bequest of £1,000 by a parishioner. It is executed in oak, with panels and columns of red Mansfield stone, while the figures are of white alabaster. The central subject is "The Crucifixion."

An arbitration in the claim of the Trustees of Ushaw College against Mr. Henry Chaytor, of Witton Castle, for damages exceeding £3,000 for subsidence from colliery workings, was heard on Wednesday, Thursday, and Friday last at the North-Eastern Hotel, Darlington. Mr. Clarke, of Guisborough, and Mr. Sample, of Bothol, were the arbitrators, Mr. Rutherford, of Kirkleatham, being umpire. The arbitrators and umpire will make known their award in due course.

The Hornsey Charity Trustees have now received the permission of the Charity Commissioners to demolish the almshouses in Muswell Hill-road, near Churchyard Bottom Wood, Highgate, and to erect villas on the site for the purpose of creating ground-rents to be used as pensions.

After a long discussion, the Sanitary Committee of Bristol decided to offer a premium of 50 guineas for the best design submitted in open competition for a building to be placed on the triangular open space in St. Augustine in that city. The committee agreed not to appoint an assessor, and further that the premium shall merge in the commission if the work be carried out by the selected competitor.

A new Wesleyan church in the High-street, Ilford, has been opened. It is Gothic in style, is built of red brick, with Bath stone dressings. Accommodation has been provided for 730 persons, at a cost of about £4,300.

At Coggeshall parish church, Essex, the organ, built in 1873, has just been rebuilt and enlarged by Messrs. Bishop and Son from a design by the Rev. E. Geldart. The new case is of oak, and has been carved by Mr. W. B. Polley, of Coggeshall, who also executed all the carving in the pulpit and benches of this fine Perpendicular church.

#### MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Builders' Clerks' Institution. Inaugural meeting at St. James's Hall, Piccadilly. 8 p.m.

Visit of Building Construction Classes from Polytechnic, Regent-street, and from Grosvenor House, Walthamstow, to Pawsons and Leafe's new buildings, St. Paul's Churchyard. 2.30 p.m.

Edinburgh Architectural Association. Visits to Dundas Castle and Kirkliston Church. From Waverley Station, 2.10 p.m.

MONDAY.—Royal Institute of British Architects. "Saint-Pierre-de-Liens, the Ancient Cathedral of Geneva," by Louis Viollier and Lawrence Harvey. 8 p.m.

Surveyors' Institution. "The Light Railway Bill, 1896," by A. C. Pain. 8 p.m.

TUESDAY.—Society of Architects. "Bricks and Clay," by H. Greville Montgomery. 8 p.m.

Institution of Civil Engineers. "The Lixivation of Silver Ores," by John H. Clemens; "Mining and Treatment of Copper Ore at Tharid, Spain," by C. F. Courtney; and "Tin-Smelting at Pulo Brani, Singapore," by John McKillop and T. Flower Ellis. 7 p.m.

WEDNESDAY.—Surveyors' Institution. Annual Dinner at the Whitehall Rooms, Hotel Metropole. Carpenters' Hall Free Lectures. "The Decay and Failure of Buildings," by Prof. T. Roger Smith, F.R.I.B.A. 8 p.m.

Society of Arts. "Bahamas Sial Industry," by Dr. D. Morris, C.M.G. 8 p.m.

THURSDAY.—Society of Arts. "The Great Landlip at Gohna, in Gorkwal," by J. H. Glass, C.I.E. Imperial Institute. 8.30 p.m.

FRIDAY.—Architectural Association. "The Architecture of the Teutonic Order," by C. Fitzroy Doll. 7.30 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE FIFTH ORDINARY MEETING of the Society of Architects for the Session 1895-6 will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on TUESDAY, MARCH 14th, 1896, at eight o'clock p.m., when a paper will be read by Mr. H. GREVILLE MONTGOMERY, entitled "BRICKS AND CLAY."

ELLIS MARSLAND, Hon. Sec.

## The Society of Architects.

Founded 1884. Incorporated 1893.

#### EXAMINATION FOR MEMBERSHIP.

The Examination for Admission to Membership of the Society of Architects comes into operation on NOVEMBER 1st, 1896.

The Subjects of the Examination to be held by the Society are as follows:—

##### Section I. ARCHITECTURE.

Subject (a). *Planning and Design*.—The plan and design of some building, or portion of a building, with details to a larger scale.

Subject (b). *Architectural History*.—The general principles of the various styles and periods of Architecture; their dates, mouldings, and enrichments.

##### Section II. BUILDING CONSTRUCTION AND MATERIALS.

Subject (a). *Construction*.—Constructional details in all trades.

Subject (b). *Materials*.—The properties, methods of working, manufacture, and the application of materials to building works.

##### Section III. PRACTICE.

Subject (a). *Specifications*.—Preparation of specifications, and the examination of Builders' accounts.

Subject (b). *Contracts*.—The conditions pertaining to a building contract; the relative positions of architect, client, and contractor; and other questions of ordinary practice.

Subject (c). *Sanitary Science*.—To include water supply and drainage, ventilation, lighting, and heating of buildings.

##### ALTERNATIVE EXAMINATIONS.

The Council accepts, in lieu of the Society's own Examination, certain Examinations as partly or wholly alternative. Full particulars of these and of the Synopsis of the Examination will be published shortly.

ELLIS MARSLAND, Hon. Sec.

St. James's Hall, W., December, 1895.

The London and North-Western Railway Co. are widening portions of their Chester and Holyhead line between Chester and Abergale. The work is being done in sections, the first portion being from Mold Junction, near Chester, to Connahs Quay; the second from Bagillt to Holywell; the third from Morfa Crossing, near Point-of-Air, through Prestatyn to Rhyl; and the fourth from Ford Station to Abergale. The two first portions are nearly completed, and the others are in progress and will soon be finished. A new station is being erected at Prestatyn.

Miss Roteley, of Swansea, who died last week, leaves her collection of paintings by Murillo, Reynolds, and other artists to the Royal Institution, Swansea, and freehold property in Castle-street to the Government School for the Sons of Officers in the Navy and Royal Marines. The Nelson relics are to go to Greenwich Hospital. These include the famous breeches and two gold shoe-buckles supposed to be Nelson's, a massive gold ring bearing Nelson's motto, and also inscribed, "To Lieut. Roteley, R.M., of H.M.S. *Victory*, 110 guns, by his Swansea friends, as a tribute of esteem for his bravery at Trafalgar," medals for Trafalgar, Copenhagen, Albuera, and Crimea, as well as one presented by a Mr. Boulton to heroes of Trafalgar, a dirk, and several miniatures.



## Trade News.

### WAGES MOVEMENTS.

**BIRMINGHAM.**—In November last the operative house-painters and decorators gave notice to the employers for an advance in wages and some alterations in working rules. The Birmingham Master Builders' Association have decided that, in view of the improvement in trade and the relative position of the men engaged in the decorating and painting business with those working in other branches of the building trades, the men were entitled to have the alterations asked for. A new code of working rules has accordingly been signed whereby the operatives gain an additional halfpenny an hour, making the minimum rate of wages on and after 1st April next eightpence an hour. Other concessions of less importance were obtained, one of these being a new clause which makes the rules in their entirety binding within a radius of four miles of Stephenson-place.

**BLACKPOOL.**—The dispute between the master joiners of Blackpool and the workmen was concluded on Saturday morning, work having been suspended for upwards of three weeks. In the first instance the men wanted an advance of 1d. per hour; but they have now accepted a halfpenny, and the masters have also conceded a point as regards overtime. The plasterers' strike is still in progress, and a dispute has also arisen between the master plumbers and the workmen.

**EDINBURGH AND LEITH.**—A mass meeting of joiners was held on Friday night in the Albert Hall, Edinburgh (Mr. John Nisbet presiding), for the purpose of hearing the employers' decision on the by-laws proposed and adopted at a mass meeting of the men a few weeks ago. The masters' reply was to the effect that a deputation of seven had been appointed to meet with a like number of the members of the employees' association to discuss the whole question. The secretary stated that the committee had decided to accede to the employers' request, and to appoint a deputation of seven to meet seven of the employers. The recommendation of the committee was carried almost unanimously, and the delegates were chosen out of the meeting.

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### TENDERS.

\* \* \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**AYLESBURY.**—For alterations and additions to the Falcon Inn, Aylesbury. Mr. Guest Luckett, Aylesbury, architect:—

Walls and Sons, Chesham	£577 0 0
Brown, E., Watford	493 7 0
Grist, S., and Co., Burton	498 0 0
Senior and Clarke, Wendover	418 16 0
Stacey, Aylesbury	402 7 0
Grimsdale, Aylesbury (accepted)	374 7 0

**ALDERSHOT.**—For building stable in rear of 9, Wellington-street, Aldershot, Hants, for Messrs. C. Hammerton and Co. Mr. Stanley Parker, 427, Edgware-road, W., architect:—

Kemp, G., Aldershot	£168 0 0
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**BECKENHAM.**—For the erection and completion of seven houses in Avenue-road. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect:—

Pharaoh, H. (accepted)	£2,000 0 0
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**BECKENHAM.**—For the erection and completion of 12 houses in Clock House-road, Beckenham. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect:—

Pharaoh, H. (accepted)	£3,650 0 0
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**BOURNEMOUTH.**—For new main sewers at Boscombe. Mr. F. W. Lacey, A.M.I.C.E., borough engineer and surveyor:—

Troke, G.*	£11,121 7 0
Saunders, W. H., and Co.	10,279 0 0
Adams, T.	8,054 0 0
Saunders, S.*	7,795 0 0
Cooke, B., and Co.†	7,790 0 0
* Informal. † Accepted.	

**BOURNEMOUTH.**—For painting Bournemouth Promenade Pier. Mr. F. W. Lacey, A.M.I.C.E., borough engineer and surveyor:—

Cutler, F. T.	£405 0 0
Dacombe and Son	350 0 0
George and Harding*	290 0 0
Jenkins and Sons	227 10 0
A.—White-lead paint. B.—Calley's Torbay oxide paint.	
* Informal. † Accepted.	

**BRAINTREE.**—For erecting new Post-office in High-street, for Mr. G. Thorpe Bartram. Mr. J. W. Clark, Coggeshall, Essex, architect. Quantities by Mr. J. S. Parmenter, Exchange Chambers, Ipswich:—

Parmenter, S. C.	£1,328 0 0
Brown, A.	1,270 0 0
Potter, H.	1,215 0 0
Letch, W. E.	1,190 0 0
West, E.	1,150 0 0
Thoday and Co.	1,090 0 0
Smith, J., and Son, Witham*	1,034 0 0
* Accepted.	

**BRISTOL.**—For extensions of Messrs. W. D. and H. O. Wills' factory. Messrs. F. W. Wills and H. O. Wills, joint architects:—

Beaven, A. J. (with alterations), about £8,000.  
(Lowest of six invited tenders.)

**BRISTOL.**—For new Salvation Army buildings in Ashley-road, Bristol. Mr. Alex. Gordon, M.S.A., 107, Queen Victoria-street, London, E.C., architect:—

Love, E.	£5,931 0 0
Hatherley and Carr	5,635 0 0
Church, W.	5,463 0 0
Walters, E.	5,338 0 0
Wilkins, G. H.	5,180 0 0
Davis, J. E.	4,990 0 0
Wilkins, R.	4,790 0 0
Love and Waite	4,599 0 0
Morgan, T., Wood-green, N.	3,979 12 0
Rest of Bristol.	

**BRITTON HILL.**—For the building of a new school for 894 children, with schoolkeeper's house, on Britton-hill, for the London School Board:—

Lovatt, H.	£19,752 0 0
Longley, J., and Co.	19,600 0 0
Lathey Bros.	19,524 0 0
Holloway Bros.	19,262 0 0
Peacock Bros.	18,963 0 0
Patrick, J. and M.	18,867 0 0
Nightingale, B. E.	18,849 0 0
Hart Bros.	18,761 0 0
Pattinson, W., and Sons	18,670 0 0
Downs, W.	18,387 0 0
Charteris, D.	18,315 0 0
Wallis, G. E., and Son	18,273 0 0
Cox, C.	18,159 0 0
Shillitoe, J., and Son	18,123 0 0
Stimpson and Co.	17,890 0 0
Holliday and Greenwood	17,759 0 0
Lawrance, E., and Sons	17,529 0 0
Kirk and Randall*	17,322 0 0
* Recommended for acceptance.	

**BURY, LANCs.**—For executing contract No. 6 of the sewerage scheme, being the construction of tanks and filter beds, for the town council:—  
Freeman, G. and Sons (accepted).

**CANTERBURY.**—For the repainting of the corn market, for the city council:—

Miller, H.	£108 8 0
Small, W. H.	102 6 6
Cozens, W.	80 10 0
Wiltshire, W. (accepted)	80 0 0

**CLAPHAM.**—For alterations and additions to the Royal William p.h., Dorset-road, S.W., for Mr. T. J. Jones. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect:—

Jackson, J.	£887 0 0
Edwards and Medway	867 0 0
Stephens, J. T.	826 0 0
Peacock Bros.	805 0 0
Candler and Sons	782 0 0
Maxwell Bros. (accepted)	769 0 0

**DERBY.**—For the erection of Roman Catholic Church, Gordon-road, for the Rev. F. S. French. Mr. James Hart, Corby, Grantham, architect:—

Morley, E., Derby	£2,842 11 0
Vernon, H., Derby	2,797 2 8
Robinson, J. H., Derby	2,774 9 11
Clarke, A. B., Nottingham (accepted)	2,708 0 0

**FARNBOROUGH.**—For repairs to stables at the Duke of Cambridge Hotel, Farnborough, Hants, for Messrs. C. Hammerton and Co. Mr. Stanley Parker, 427, Edgware-road, W., architect:—

Kemp, G., Aldershot	£62 0 0
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**HARROGATE.**—For the construction of six fire-tanks in different parts of the town, for the corporation:—  
Stephenson, J., Harrogate (accepted).

**HACKNEY.**—For the erection of a new school in Sigdon-road for 864 children, with playground on roof for boys, and manual training centre and schoolkeeper's house, with room under, for the London School Board:—

Gregar, W., and Son	£19,145 0 0
Pattinson, W., and Sons	18,225 0 0
Roberts, L. H. and R.	17,940 0 0
Clarke and Bracey	17,874 0 0
Atherton and Dolman	17,789 0 0
Shillitoe, J., and Son	17,540 0 0
Kilby and Gayford	17,494 0 0
Shurmer, W.	17,298 0 0
Lawrance, E., and Sons	17,010 0 0
Treasure and Son	16,934 0 0
Grover, J., and Son	16,878 0 0
Cox, C.	16,699 0 0
Dabbs, W. M.*	16,630 0 0
* Recommended for acceptance.	

**HORFIELD.**—For making up Logan-road, for the urban district council:—  
Dare and Co. (accepted) £90 0 0

**HORFIELD.**—For making up Bishop-road, for the urban district council:—  
Marshall and Lovell (accepted) £196 0 0

**LINCOLNSHIRE.**—For the supply of granite for the coming year, for the county council of Holland, Lincolnshire:—  
Accepted tenders:—

Groby Granite Company	5,634 tons
Mountsorrel	3,240 "
Somerfeld (Belgian) granite	1,900 "
Kaltenbach and Schmitz (Belgian)	1,120 "

**LIVERPOOL.**—For works of painting at the Walker Art Gallery, for the corporation:—

White, A., and Sons (accepted)	£110 0 0
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**LIVERPOOL.**—For erecting new propagating houses in Sefton Park, for the corporation:—

Paterson, J., and Sons, Soho-street, Liverpool (accepted)	£1,147 0 0
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**LIVERPOOL.**—For supplying (a) 100 iron chairs and (b) 150 seats for use in the public parks, for the corporation:—  
Peake, W. H., and Son, Seel-street (accepted),  
(a) 4s. each, (b) 16s. each.

**LIVERPOOL.**—For erecting a shelter in Wavertree Park, for the corporation:—  
Paterson, J., and Sons, Soho-street, Liverpool (accepted) £132 0 0

**LIVERPOOL.**—For alterations to the Crown Court, St. George's Hall, for the city council:—  
Gabbutt, E., Oakes-street, Liverpool £1,247 0 0  
(Accepted.)

**LOOE.**—For additions to the board schools. Mr. J. H. Sanson, of Liskeard, architect:—  
Hooper and Hickey ... £287 8 0  
Whale, G. ... 265 0 0  
Dawe, S. (accepted) ... 243 5 0

**LONDON.**—For alterations, new shop-front, &c., to 5, 6, and 7A, Tottenham Court-road, W., for Mons. Reiss. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect:—  
Sims and Wood (accepted) £274 0 0

**LONDON.**—For repairs, &c., to No. 15A, Deacon-street, S.E. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect:—  
Parsons, J. (accepted) £178 0 0  
(Lowest of four tenders received.)

**LONDON.**—For the erection of glass covered way to the entrance to Gower House Hotel, Gower-street Station, N.W. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect:—  
Gardiner and Co. (accepted).

**LONDON.**—For engineering works in connection with the new St. Marylebone Public Baths and Washhouse. Mr. A. Saxon Snell, F.R.I.B.A., architect. Quantities by Messrs. Northcroft, Son, and Neighbour:—

Berry, Z. D., and Sons	£12,998 0 0
Wall, C.	12,480 0 0
Frazer, J.	12,285 0 0
Young, H., and Co.	11,970 0 0
Rosser and Russell	11,635 0 0
May, J. and F. (accepted)	11,050 0 0

**LONDON.**—For electric-lighting, wiring, fittings, &c., in connection with the new St. Marylebone Public Baths and Washhouse. Mr. A. Saxon Snell, F.R.I.B.A., architect. Quantities by Messrs. Northcroft, Son, and Neighbour:—

Donnison, F. A., and Co.	£2,050 0 0
Suter, F., and Co.	1,950 5 4
South, E.	1,950 0 0
Dawson, R., and Co.	1,681 3 7
Emanuel and Co.	1,666 0 0
Strode and Co.	1,633 10 5
Alwyn, L.	1,422 0 0

**LONDON.**—For the completion of eight shops, with suites of chambers over, at Green-street, Leicester-square, for Mr. C. H. Newman. Mr. G. D. Martin, 3, Pall Mall East, S.W., architect:—

Dove Bros.	£5,305 0 0
Allen, J., and Sons	5,123 0 0
Lovatt, H.	5,037 0 0
Lea, H. and E.	4,849 0 0
Gibbin, W., and Son	4,800 0 0
Larter, W., and Son	4,785 0 0
Myring, J., and Co.	4,675 0 0
Colwill, F.	4,672 11 7
Eddie, E.	4,296 0 0

**MACCLESFIELD.**—For the erection of new school-buildings belonging to Trinity Wesleyan Chapel. Mr. W. G. Hunt, architect:—  
Clayton, J. (accepted) £1,190 0 0

**MAIDSTONE.**—For (A) supplying fire-extinguishing appliances, and (B) carrying out certain work at the union:—

Batchelor	£75 5 0
Gardner and Co.	64 19 0
Munn, C.	59 10 0
Crundwell, J.*	55 0 0
* Accepted for both A. and B.	



MALLING.—For furnishing the new infectious diseases hospital at East Malling, for the Malling Rural District Council. Accepted tenders:—

Furniture:—	
Apps Brothers, West Malling	£152 19 6
Ironmongery:—	
Apps Brothers	£78 7 10
Lowest tender received.	

MILLWALL.—For building a new school for 596 children, with schoolkeeper's house, for the London School Board:—

Pattinson, W., and Sons	£17,813 0 0
Shuraur, W.	17,631 0 0
Grogar, W., and Son	16,960 0 0
Lathey Bros.	16,848 0 0
Atherton and Dolman	16,785 0 0
Grover, J., and Son	16,761 0 0
Lawrance, E., and Sons	16,119 0 0
Shillitoe, J., and Son	15,980 0 0
Dabbs, W. M.	15,858 0 0
Cox, C.	15,844 0 0
Treasure and Son	15,770 0 0
Roberts, L. H. and R.	15,684 0 0
Patrick, J. and M.	15,426 0 0
Longley, J., and Co.	15,151 0 0

\* Recommended for acceptance.

MITCHAM.—For the erection of a house and stabling at Baron-grove, Lower Mitcham, for Miss Johnson. Mr. Robert M. Chart, F.S.I., M.S.A., Union Bank Chambers, Croydon, and Vestry Hall, Mitcham, architect and surveyor. Quantities by Messrs. Franklin and Andrews, 25, Ludgate-hill, E.C.:—

Stewart, D., and Sons, Wallington	£2,288 0 0
Burges, J., Wimbledon	2,035 0 0
Burnand, E. J., Wallington*	1,950 0 0

\* Accepted.

NEWPORT, MON.—For the erection of six cottages and stable at Cwmtillery, Mon., for Mr. F. Fielding. Messrs. Lansdowne and Griggs, Newport, architects:—

Morgan and Evans, Pontnewynydd	£2,034 17 5
Morgan, J., Blaenavon	1,981 8 0
Hatherley and Carr, Bristol	1,937 0 0
Richards, A., Newbridge	1,655 0 0
Griffiths, G. H., Newport	1,626 0 0
Ellis and Read, Newport	1,597 15 0
Summers, H., Cwmtillery*	1,554 13 0

\* Accepted.

NEWPORT, MON.—For the erection of two shops and premises, Blackwood, Mon., for Mr. Chas. Jorian. Messrs. Lansdowne and Griggs, Newport, architects:—

Williams, E., Newbridge	£792 0 0
Morgan and Evans, Pontnewynydd	747 0 0
Morgan, C. F., Newbridge	730 0 0
Linton, J., Newport	730 0 0
Morgan, J., Blaenavon	695 0 0
Reed, C., Newport	626 0 0
Vaughan, D., Tredegar (accepted)	535 0 0

NEWPORT, MON.—For the erection of stable, &c., for Mr. Burpitt. Messrs. Lansdowne and Griggs, Newport, architects:—

Griffiths, G. H., Newport	£130 0 0
Williams, R., Newport	125 0 0
Colwill and Baglow, Newport*	120 0 0

\* Accepted.

NEWPORT, MON.—For the erection of Exchange p.h., Commercial-street, Newport, Mon., for Mr. Rowe. Messrs. Lansdowne and Griggs, Newport, architects:—

Moore, W.	£985 0 0
Davies, J.	980 0 0
Rowden	980 0 0
Frazier	897 0 0
Davies, E. J.	880 0 0
Price, W.	877 0 0
Hopps	865 0 0
Reed, C. H.	848 0 0
Parfit, D.	847 0 0
Davies, T. J.	840 0 0
Diamond, T. G.	837 0 0
Jenkins, J.	829 0 0
Reed, C.	821 0 0
Linton, J. (accepted)	784 0 0

All of Newport.

NEWPORT, MON.—For the erection of ten cottages, for Messrs. Griffiths Bros., Ltd., at Abertillery, Mon. Messrs. Lansdowne and Griggs, Newport, architects:—

Williams, J. D., Knighton	£2,680 0 0
Jones, D. C., and Co., Gloucester	2,817 0 0
Hatherley and Carr, Bristol	2,297 0 0
Morgan and Evans, Pontnewynydd	2,013 0 0
Rosser, H., Abertillery	1,825 0 0
Budding, W., Tydu	1,787 0 0
Davies, T. J., Newport (accepted)	1,580 0 0

NORWOOD.—For the erection and completion of six houses on Beulah Hill. Mr. William G. Ingram, M.S.A., 44, Theobald's-road, Bedford-row, W.C., architect and surveyor. Quantities by Mr. F. G. W. Buss:—

Prestige and Co.	£4,188 0 0
Mattock Bros.	4,173 0 0
Maxwell Bros.	4,069 0 0
Courtnay and Fairbairn	4,039 0 0
Jarvis, J. H.	3,993 0 0
Whitehead and Co.	3,890 0 0
Heath, S.	3,772 0 0
Palmer, E. R.	3,645 0 0

PETRES.—For additional story to All Saints' School, Lower Common. Messrs. Lee and Pain, architects:—

Accepted tenders:—	
Roberts, L. H. & R. (modified tender)	£2,533 0 0
Zinc work:—	
Bradley and Co.	128 0 0

PLAISTOW, E.—For alterations and additions to the Balaam-street Congregational Church, Plaistow, E. Messrs. Newman and Jacques, 2, Fen-court, E.C., architects. Quantities by Messrs. R. L. Curtis and Son:—

Maddison	£2,737 0 0
Cooper and Jerram	2,686 0 0
Sharpe	2,563 0 0
Symes	2,468 0 0
Keen	2,440 0 0
Pavey	2,390 0 0
Nightingale, B. E.	2,350 0 0
White	2,339 0 0
Holland, J.	2,285 0 0
Thompson and Beveridge	2,242 0 0
Batley, Son, and Holness	2,197 0 0
North Bros.	2,150 0 0
Horlock, J. G.	2,149 0 0
Holland, W. G. (accepted)	2,077 0 0

RICHMOND.—For alterations, new shopfront, chimney shaft, &c., Eton-street, Richmond, for Mr. J. G. Hatton. Mr. Brewer, Richmond, architect:—

Appleby, J., London and Richmond	£310 0 0
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(Accepted.)

RYDE.—For alterations and additions to Sorrento Lodge, for Col. J. M. England. Mr. John I. Barton, Ryde, architect:—

Whitewood, J., Ryde (accepted)	£397 0 0
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RYDE.—For new bakehouse, ovens, kitchens, &c., Union-street, Ryde, for Mr. Arthur S. Marlow, confectioner. Mr. John I. Barton, Ryde, architect:—

Langdon	£597 0 0
Barton, I., Ryde (accepted)	597 0 0

RYDE.—For new school-buildings and teacher's residence at Haven-street, for the Ryde School Board. Mr. John I. Barton, Ryde, architect:—

Holland	£1,747 10 0
Whitewood	1,495 0 0
James, O.	1,476 0 0
Barton	1,234 0 0
Binstead, E. J., Ryde (accepted)	1,195 0 0

SHAW.—For new Salvation Army building, for the Shaw Citadel Co., in Farrow-street, Shaw, Mr. Alex. Gordon, M.S.A., 107, Queen Victoria-street, London, E.C., architect:—

Mann, J. and G., Shaw	£1,140 0 0
Bryon, J., Shaw	1,108 10 0
Greenwood, H., Rochdale	990 0 0
Morgan, T., Wood-green, N.	794 12 0
Rhodes Bros., Shipley, Yorks	675 0 0
Lewis, P., Shaw, Lancs.	644 17 4

STOCKWELL.—For alterations to roof of brewhouse at the Stockwell Brewery, Stockwell, S.W., for Messrs. C. Hammerton and Co. Mr. Stanley Parker, 427, Edgware road, W., architect:—

Parsons, E., and Co., Wandsworth	£335 0 0
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# ELECTRIC LIGHTING.

## GENERATING PLANT AND WIRING.

## Drake and Gorham,

ELECTRICAL, MECHANICAL, AND HYDRAULIC ENGINEERS,  
66, Victoria St., Westminster, London, S.W.  
AND AT MANCHESTER, GLASGOW, AND SCARBOROUGH.

Every information as to the advantages of the different systems of wiring and their application to individual cases will be given to Architects free of charge, together with estimates of the cost.

This well-known firm have refused to accept agencies for any one method, whether Interior Conduit Concentric, or other system, as they recognise that each have their advantages under certain working conditions, and they prefer to be free to advise upon the results of their large experience. Both Partners have been exclusively engaged since 1881 in electric lighting and the application of electricity to power in every branch. A list of 400 houses lit by this firm, to any of which references may be made, will be furnished on application. It includes:—

Chatsworth and Devonshire House, for His Grace the Duke of Devonshire.  
Wynyard Park and Londonderry House, for the Right Hon. the Marquis of Londonderry.  
Lansdowne House, for the Right. Hon. the Marquis of Lansdowne.  
The Bank of England and Branches. North British and Mercantile Insurance Co.  
New Scotland Yard; and Prudential Assurance Co., Holborn Bars.



## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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FRIDAY, MARCH 20, 1896.

## PROCRASTINATION STREET.

IS there anyone now living who can remember the first proposal for a great street to connect Holborn with the Strand? And is there anyone now living who is likely to see that street finally completed? Every year or two there comes up a rumour of it. Like the sea-serpent, the scheme shows its head for a little space above the waves, and then, just as we think we are really going to capture it, it dives under, and is visible no more. Like the sea-serpent, too, it takes different forms at its different appearances. Sketches of it have been published during the last quarter of a century, showing it with all sorts of shapes, though we are bound to say that the most recent one, which appeared in our columns last week, does not differ very widely from the type which we caught a glimpse of last year. It is now 100ft. in diameter instead of 90ft., but in other respects it is pretty obviously the same animal. Even the sea-serpent will be landed some day, if there is one. And we are sanguine enough to believe, in spite of general scepticism, that the new street will be on view about the same time, if not sooner. Years ago, there was a talk of calling it the "Council Broadway." But as that name would now be palpably absurd, and as the "In-spite-of-the-Council-Broadway" would be inconveniently long, we venture to suggest the designation which heads this article. The Council will not last for ever, any more than the Metropolitan Board did, and there is no knowing under what authorities, or by what public bodies, the work may be finished. Its appellation need not, therefore, be used "their virtues to record, or drag their frailties from their last abode." The one fact about it which will be stamped on the universal memory is the interminable delay in beginning it. We cannot make its title an opportunity for personal praise, and we need not make it a vehicle for personal blame. Let us tacitly recognise the facts, and make it simply "Procrastination Street."

The subject tempts us to look far into the future. Under what system will our own art be going on when the last gaps in Procrastination Street are being filled up? Will architects have ceased to be, and will the surveyor-of-all-work reign supreme? As it is, he gets nearly all the pay; perhaps by that time he will have got all the management, too. Then those who are unfortunate enough to be living will see him turn out a kind of glorified Gower Street—a Gower Street that is no longer plain, and so far inoffensive, like the old one, but stuck over from end to end with trash and frippery, and catalogue-makers' "decoration." Or will the architectural societies before that have come to their senses, and, unmoved by the glitter of his guineas, will have refused to acknowledge the surveyor-of-all-work as an architect? Of course, that will not prevent him from putting up a brass plate with "architect" on it. The fact that the Royal Academy ignores him does not prevent the milkman's sign-painter—"the hartiss wot paints for me," as *Punch* has it—from describing himself as "artist to the trade." But, just as the Royal Academy's non-recognition of him helps the outside public to discern that there are artists and artists, so the Royal Institute's non-recognition of the surveyor-of-all-work would indicate to them that there are also architects and architects. An architectural society is respected when it

respects itself. As long as it admits mere measurers and valuers to its ranks, with no faculty for anything above measuring and valuing, so long the world may be pardoned if it gives them its architectural work to do. No doubt a man *may* be a true architect, although he takes out quantities, and understands valuations, just as he may be a true architect although he understands chemistry or zoology. But these things, which in their own place we should be the last to undervalue, should be no qualification for entry to an Institute of Architects; and the more resolutely this principle is acted on hereafter, the better will be the prospect for our successors and their productions.

Then there is the working man to be taken into account. Where will he have got to, when the new street is done? Everybody is trying to raise him, and he is trying to raise himself. In the latter case, the desired rise—to which he is perfectly entitled if he can get it—is mainly a rise of wages: in the former case it is chiefly a rise in general education. Some improvement, probably, is possible in both ways. But it seems obvious that in each direction a limit cannot be distant. We cannot all have £500 a year, nor even half that sum; and if we all could, we should find ourselves no better off than we now are. Neither can we all have a University education or its equivalent. Evening classes for workmen, working men's colleges, and other such appliances do good; but where the good is very marked, it is done either to exceptionally clever men, or to men in exceptionally easy circumstances. The average workman cannot add an evening of severe study to a day of hard physical labour. Human powers are bounded; and the people who expect this of the workman would not do it themselves. If he goes now and then to an amusing lecture, or looks through a novel at a free library, he is getting a necessary rest, and perhaps learning a little at the same time, and there are very few of us who are in a position to reproach him. These things benefit a man, and make his life pleasanter and freer from coarse temptations; but they can hardly be said to raise him—in the high-flying sense in which the expression is commonly used. To raise a man, really and effectually, is to raise him in his work. It is in that, and not chiefly in his amusements and his recreations, that his true life consists; and in this there is room for an almost unlimited rise. The workman has a possibility before him which he hardly realises—the possibility of developing himself out of a two-legged machine into a human being with intelligence and invention, and imagination. These qualities at present he keeps for his play-hours. It does not strike him that they can be used at the bench or on the scaffold. His utmost hope is to remain a two-legged machine; but a machine earning six shillings a day instead of five, or seven shillings instead of six. Suppose, some day, he, or his successor, does earn it. There must obviously be a point at which no further rise can do him any good, because, as wages rise, the cost of everything made by wage-earners will rise too. Let that point be reached, and though the workman may be a little more comfortable—a little more at leisure than he now is—without other changes, he will be but a machine of two legs still. His life will still be one of mechanical drudgery; he will still be used as a cheap substitute for a steam-engine or a gas-engine. While he is only this, he will still be looked down upon. He will still belong, not simply to the poorer classes, but to the *lower* classes—lower in intelligence, in taste, in skill. But society will never be stable as long as the great majority of it constitutes a "lower class." Whether the great majority of it shall constitute a poorer class—provided its poverty is not degrading or intolerable—is comparatively a trivial matter. The common mistake

of present-day reformers is to confuse a poorer class with a lower class. Money, they think, answers all things, and they can conceive of no rise for the workman that does not depend on a rise in wages. It is natural to wish for it, and work for it; we all wish, and work that we may be more prosperous; but it is a very poor rise that begins and ends with a better-filled purse. A great poet, who belonged to the poorer, though assuredly not to the lower, classes, has told us, as to honest poverty, that "a man's a man, for a' that." But a man is not a man when all his mental faculties perish for want of use, through his having been kept from childhood at some routine of drudgery which needs only muscles and not brains. We are sometimes told that all the things worth most in the world have been produced by the toil of the labouring classes. There might have been an approximation to the truth in it, if this had been said 400 years ago. We hope the time may come when there may be an approximation to the truth in it again; but as things now are, it only shows that those who say so can see no worth in knowledge, or wisdom, or beauty. The poorer class once had a share—and a large one—in producing all these things. Broadly speaking, it produces them no longer; and will remain not only the "poorer class," but the "lower class" also, till it sets about producing them again.

For hundreds—probably thousands—of years the skilled workmen in the building trade, each in his own little sphere, designed and invented their own bits of detail. There was an architect, no doubt—sometimes called by that name, and sometimes by others—and even in the far-off days when the "Odyssey" was written, this architect was a man highly honoured.

"None call to feast  
Other than men that are of public use;  
Prophets, or poets, whom the gods produce,  
Physicians for men's ills, or architects:  
Such men the boundless earth affords respects."

So says Eumæus, according to Chapman's translation, and this is not the only place in the poem where our profession is mentioned as a dignified one. But even then, and still more in Mediæval times, the architect was but the leader in a band of practical artists, some very humble in their station, and others more and more able till they almost equalled him. He did not have, as he now does, to find structural knowledge and inventive talent, common sense, and taste, and imagination, for everybody under him. It was enough if he found them for his own department, if he put them into the general scheme of the work, which was his own speciality, and if he so supervised their exercise by his subordinates that his building grew up into one harmonious whole, and not into a heap of discordant details. It would be well for architects, well for architecture, and well for workmen, if things still went on so. We waste our lives in attempting too much. Our only chance is to go back to the ancient system, and to be leaders and managers, not factotums. But this implies that workmen must learn once more to do what they never ought to have given up doing. It means that they must put their hearts into their work, and think about it and love it. It means that they must be trained to understand it and improve it, and when this comes to pass there will be more fellow feeling, not only between them and the architects whom they will once more meet on common ground, but between them and the cultivated part of the community in general. Whether they are the poorer class or not, they will then be a great deal further off than they now are from being the "lower class."

The possibility of this change depends on the arrival or non-arrival of still greater ones. Will there be work in England for a working class when "Procrastination Street" grows near completion? Or will England's coal supply be almost used up, and its commerce nearly extinct, and its building con-



sequently, at an end? Will it then be ceasing to be a place of business, and its smoky towns be going back to good green fields again? Will Covent-garden really be a garden once more, and flowers be raised where now they are only sold? The Thames may be running clear by that time, and salmon leaping in the sunshine. The old trees on the Embankment may be forcing its granite blocks apart, the Underground Railway may have collapsed into a grass-grown cutting, Cleopatra's Needle may be lying at full length, and the Nelson column be visibly dangerous. But, except its outer dome, St. Paul's is not likely to be much the worse for wear. The Palace of Westminster will probably be safe, and Waterloo Bridge still fit for traffic. Even London Bridge will hardly be in ruins yet; and when it is, the New Zealander, who, according to Macaulay, is to sit on them, will, after all, only be a New Zealander of English descent, come back to see the land his ancestors sprang from. He will find plenty of relatives here, from East and West, and South, all on similar visits. For there is no sign that the English race is dying out. At most, it will only carry on its business elsewhere, should circumstances require, and will keep Old England for its country house. Poets and prophets have had such a vision; a foresight of London retired from work, and made into an All-Saxon-Home, a meeting-place for men of English race from all over the world. May it be long before it is realised; and as "Procrastination Street" will hardly then be wanted, may the London County Council bestir themselves, and get it finished first.

#### PROFESSIONAL CRAMMING.

SUCCESS in competitive examinations has been rather discredited of late by many of our ablest men and examiners. It has been well said that the "practical man who can do a thing would stand no chance with the crammed man who could not do it." A story is also told that the late Mr. Cook, the billiard player, was once taken to task by a mathematician, who talked learnedly about angles of incidence and reflection, and said that no man could be a good billiard player who did not understand these angles. Cook replied that he did not know what they meant; but challenged his visitor to study the angle, and that he would give him a good start, and play him for a sovereign a game. It is needless to say the mathematician lost. A competitive examination would have certainly given the mathematician the better chance. Cook would not have been in it. Many other instances could be given to show that the "crammed" man does not necessarily understand things better than the practical man.

It is just now a prevailing notion that every professional architect must be a master of a great number of things, one or two of which would require a whole lifetime to learn thoroughly. Forty or fifty years ago a very different idea was entertained in architectural circles. Thoroughness in the knowledge of a particular style and in the practice of the profession was considered far more important than a general smattering of knowledge on a variety of subjects. No doubt it will be said, and truly, that the demands on the modern architect are very much more numerous now than they were fifty years ago, and that the standard of attainments is much higher. Granted; but we are not thereby to imagine that we can add to our stock of qualifications at the cost of the essential elements, or, as it were, reduce the strength of the mixture by the addition of a number of foreign ingredients. If by saying the standard of professional attainments is raised, we mean by "watering down" the special avocational work of the architect, the less we have of such admixture the better. At any rate, there is a strong tendency

amongst a certain class of educationalists to increase the dose which the young architect has to swallow, to equip him to become a sort of architectural acrobat, a kind of composite Philistine, in which construction, law, and art are all rolled into one. Till quite lately we thought that architecture was of the nature of a gift, like that of music or speech, or any of the other arts of expression—that it could not be taught entirely by books and classes; but it has been left to our time to discover that an architect can be manufactured by a system of cramming—that, in fact, there is nothing in the nature of art that cannot be brought out by a process of instruction applicable to all other subjects. Thus, we have schools for architects and craftsmen, where everything is taught, from building to the arts of painting, etching, and decoration. A youth can be made an architect, or workman, or decorator by attending one of these schools. What a school of art supported by Government grants can do or has done to make architects we are at a loss to know, except it be to teach them how to copy from the "flat" and the "round," and to acquire a certain facility in drawing ornament and patterns. These things it has certainly taught—but not in the way which appeals to our logical sense.

Someone has lately said these schools have not succeeded in making painters, and have rather catered for amateurs and young ladies. Can we believe they can make architects? Have they given us a school of national designers? We know the sort of architecture that has been turned out by them, as we have seen so often in the National Competition Prize drawings at South Kensington. With a few notable exceptions, they are rather feats of draughtsmanship, painstaking and clever, than examples of honest design evolved from practical requirements and under conditions of material. Extravagant theses, such as cathedral churches, municipal palaces, and the like, have been selected, instead of elementary everyday buildings; so that the youthful aspirant is cruelly disillusioned and helplessly thrown on his own resources when he is required to design a plain house or a workman's cottage. He is then entirely thrown off his guard, for he cannot for the life of him see how he is to descend from such flights of the imagination to commonplace construction. Very useful exercises and examples of building construction are given by the Science and Art Department, and the examinations of that Department are, without doubt, helpful to all students who go in for the elementary and advanced stages. Yet even here, the questions and solutions are so stereotyped in treatises which pretend to aid the student in preparing for them, that it is well known, when a question is slightly altered in form, many candidates are thrown off their guard and fail to answer. Facts like these serve to show how difficult it is to make a system of question and answer a test of the real intelligent grasp of the student. No doubt such a system must be beneficial as a kind of "mental gymnastics," unknown to the architect under the old régime; but it cannot make the architect.

The same "all-round man" view is held respecting the foreman and the craftsman. At one time it was essential that the foreman had a practical knowledge of a particular trade—a carpenter and joiner preferably; but now this is not so necessary as a general knowledge. The builder wants him to take his place when necessary, to receive instructions from the architect, take out quantities of materials, to give orders, understand drawings and specifications, settle disputes that may arise between the workmen, be able to represent the builder in measuring up. Not only is he expected to have at his finger-ends all the regulations of local authorities, but be an expert in drawing out

details, and well up in materials and new appliances. Let us take the building artificer. The one-man one-craft qualification is not now considered sufficient; he must be primed with a variety of matters. He is required to have had some instruction imparted in drawing, in design and modelling, and to have attended the classes of a technical school in which the arts and crafts are taught. The crafts of stone-cutting and carving, wood-carving, modelling, and decorative painting have now their evening studios; but, as a rule, they are not well attended, and why? The answer is because the young men are working at their several occupations all day at the same trades, and rather seek change and recreation in another direction. Can we be surprised at this want of appreciation? We cannot expect the young bricklayer, after he has done a day's work on a building, in laying bricks, cutting or rubbing them, to follow it up by an hour or two in a classroom of a technical school where the same operations are taught; nor a smith to spend his evenings in a shop with forges for wrought iron. Every man wants a certain amount of rest for hands and head; labour beyond its due limits is both tiresome and unprofitable. And does not the evidence brought out by the Technical Education Board prove this conclusion also—that no school education can take the place of the workshop? How slow the majority of the trades are to avail themselves of the classes! Again, we are distinctly told in the report on the London Building Trades that evening classes do not form a satisfactory substitute for apprenticeship. They are too "flimsy"; there is no reality in the exercises given, such as can be obtained "in the shop or on the job," and even in the plumbing crafts the "cran" method is no guarantee for good workmanship. These are facts which are admitted by both masters and workmen. There are two points which seem to be overlooked: one is the "coaching" of a class in certain questions which are likely to be put to candidates. How easy, for example, it would be to put a series of questions on the strength of materials or the styles of architecture that could be answered by students who had been coached, but who knew very little of the subject! On the other hand, those well acquainted with either subject might fail to answer those very questions. Then some men can impart knowledge quickly; others be unable to do so. A good mathematician is often a bad teacher, and how seldom a clever artist can impart his knowledge to others.

We have yet to learn the influence of the system of "cram" on our architecture. One of the undeniable qualities of art that has been learned in scraps and piecemeal is superficiality. We think it is Emerson who has said that "Society never advances. For everything that is given, something is taken," and he exemplifies this by referring to the fact that as new arts are acquired we lose old instincts. How true this is in architecture we cannot doubt. No one will seriously maintain that architecture as an art has advanced one step since the 16th century. Our greatest architects have been going back and repeating old work ever since, though we have learned how to apply the art to many more purposes. We have learned no end of "new arts"; but we have also lost the old instincts. We know a lot about iron, concrete, ceramic manufacture, wood fibre, and even paper; but we have not yet been able to invent a new style. Our multifarious knowledge, modern acquisitions, and teaching facilities have not added to our instinctive power of design, or enabled the architect to design woodwork, or the modeller to do better work than was done centuries ago. Hundreds of those who attend art classes of drawing, painting, modelling, and carving can turn out little but copies, expert and clever as examples of execution



and technical skill, but devoid of any real meaning or intention. There is also a diffuseness and want of character in our buildings, abundance of details gathered from sundry sources, a superfluity of ornament that distracts the mind rather than intensifying the expression. One man squanders his scientific knowledge over a variety of methods and appliances; the decorative artist distresses us by the mixture of his patterns and colours, the sanitary expert by complex arrangements and fittings. How different all this to the older method, which enabled the architect to grasp the whole design. We do not quarrel with the principle of requiring an artificer to learn another trade besides his own, as a carpenter to know something of bricklaying, or a bricklayer of mason's work; but to expect him to learn a variety of subjects in addition to his own trade, is likely to encourage him to become a smatterer rather than a real craftsman. That an architect should spend a year or two in the workshop is, of course, unreasonable, or even that he should spend a year in a mason's yard, or in a carpenter's shop; the object should be rather to make the workman an intelligent worker, and the architect a thoughtful supervisor of his own work, which he can only become by spending some of his spare time in the workshop or builder's yard, and making himself master, at least, of the conditions of craftsmanship in actual building operations. Not by the number of his acquisitions, but by the thorough grasp he has of his art, can he become a master of his profession.

#### BUILDING-ACT CASES.

SEVERAL hitches have occurred in the working of the London Building Act. We have lately referred to a few that have arisen under Section 212, relating to buildings in progress at the commencement of the Act. The other day we reported a case heard at Greenwich Police-court, in which a builder was summoned by the L.C.C., under Sect. 14 of the new Act, for having neglected to comply with certain notices which required him to set back some new buildings so that the external walls should be at a distance not less than that prescribed from centre of carriageway. The buildings in question consisted of a one-story shop and three dwelling-houses, which were being put up at the corner of two roads. The defendant had submitted plans to the district surveyor, who, it was said, approved the plans, and he also contended that no offence had been committed, as Sect. 14 referred only to the front of the building, while it was the back of the premises which abutted on the carriageway. He also argued it was a matter entirely with the district surveyor, and that the Council could not take proceedings. On the other side, it was contended that an external wall is defined as an outer wall or vertical inclosure of any building, and that the section applied to either the front, flank, or rear of a building, and that under it the Council should serve the notice on the builder, and therefore were the proper parties to take proceedings. The magistrate decided that the case came within Part II. of the Act, and that the Council had power to take proceedings under that Part, and he also thought that the back walls of the buildings were external walls within the meaning of section 13, and that they did not come within the exceptions. A penalty was imposed. After this authoritative decision we should think there would be no other attempts made to avoid the clear meaning of the section of the Act. A large number of builders are glad to take advantage of exceptions which occur in the provisions of the Act. Section 13 gives the Council power to consent to any distance less than the prescribed distance in certain cases where they think

it expedient, subject to such conditions and terms as they may think proper; but for all ordinary buildings they require that any new structure, or any part thereof, shall be at the "prescribed distance from the centre of the roadway of any street or way being a highway." This applies to any "external wall of any such building," or if there is a forecourt, "any part of" the "external fence or boundary"; and the same rule applies to any extension of any building. We can imagine what the consequences would be if owners or builders were permitted to follow their own devices or boundary lines. If the back walls or side boundary fences of buildings were exempted from the provision, we should see the return sides of premises built out in such a way that the side carriageways would be considerably contracted, footways be rendered impossible, examples of which are to be seen in many of the suburbs where the houses have been allowed to enroach on the roadway, and the building line is in advance of the other houses in the street.

In another instance a builder was summoned for commencing to lay out a street for carriage-traffic without the Council's sanction, as contained in section 7. This useful section enacts that before any person commences to form or lay out any street, whether intended for carriage-traffic or for foot-traffic, such person shall make an application to the Council for their sanction. In this case the defendant had erected two houses, and proposed to erect others in the new roadway. It was contended by the defendant that the street was commenced to be formed before the Act was passed; that there had been negotiations with the local surveyor about the drainage of houses to be built, and that, in fact, notice had been given to form a street before the passing of the Act;—therefore the new Act did not apply. The magistrate said he thought the matter might be arranged, and the summons was adjourned for the defendant to make an application. The section is a very important one that has been amended and enlarged in the new Act, where it is decisively stated: "No person shall commence to form or lay out" any such street "without having obtained the sanction of the Council." It is further laid down in a new clause that a person shall be deemed to "commence to form or lay out a street if he erect a fence or other boundary, lay down lines of kerbing," define the course of the street, form the foundations of a house, &c. The use of this clause cannot be doubted, as there were doubts before as to what constituted laying-out. Of late years we have had innumerable streets made by estate owners for the ostensible purpose of making new frontages, without any real necessity for the requirements of traffic or for the convenience of the public.

Another case of some importance came before the Court of Appeal—an appeal from the judgment of the Divisional Court upon a case stated by a police magistrate. It was as to a certain building in Stoke Newington—whether it came within section 74 or section 75 of the Metropolis Management Act, 1862. The question was as to a building line. The defendant, a builder, was summoned for beginning to erect a building beyond the line of frontage without the consent of the L.C.C., contrary to the section 75. The superintending architect had decided the general line of buildings, and the position of the building therein. The owner appealed to the Tribunal of Appeal, though the builder was not a party thereto. The tribunal confirmed the superintending architect's decision, and determined that the house in question was on land within the exceptions in section 33 of the Act 1890, such land being the sites of buildings and land existing at the time of passing the Act. It was stated that the building in question was erected 7ft. beyond

the general line, for which no consent was given, and the builder argued that the said building was exempt from the requirements of section 75 by reason of the facts being indistinguishable from those in the case of "Lord Auckland v. Westminster District Board." It was decided, after a long discussion, that the principle of Lord Auckland's case was different, that section 74 did not apply, and there was nothing to prevent the surveyor from certifying the building line as he had done. We refer our readers to our report of the appeal. From the facts as they are reported, a new street was formed at right angles to an old street, and the question arose whether the surveyor had a right to certify a building line, which he was enabled to do by there being a sufficient number of old houses in the new street. An old projecting house was afterwards pulled down, and the builder claimed to build on its site, and also on each side of it beyond the line laid down. The authorities, on the contrary, asserted he had abandoned the old house, and had thrown the site into the street, which had become a new street. In this case the old house had a forecourt on one side, and a garden on the other, and they were not part of the same curtilage as the house, and therefore it differed from Lord Auckland's case, where the ground adjacent was part of the curtilage of the old house. These instances are important ones for builders to remember. When magistrates and courts of appeal differ as to the meaning of certain decisions, it cannot be surprising that a builder should make mistakes.

#### THE SOCIETY OF ARCHITECTS.

AN ordinary meeting of the Society of Architects was held on Tuesday evening at St. James's Hall, Piccadilly, Mr. Henry Lovegrove, A.R.I.B.A., vice-president, in the chair. Eight nominations for membership were read.

#### BRICKS AND BRICKMAKING.

In the unavoidable absence of the author, Mr. H. GREVILLE MONTGOMERY, the following paper contributed by him was read by Mr. Ellis Marsland, hon. secretary:—I have thought it best to attempt to give you in as chatty and unscientific a manner as possible some few particulars concerning bricks and their methods of manufacture. In my experience and I say so with the greatest respect to the members of your noble profession I have found that in talking with architects on the matter of brick-making they have, many of them, shown the most lamentable ignorance upon the subject of brick manufacture. Only a short time ago an architect asked me how it was that all bricks were not of the same colour: while another thought that the difference between a machine-made brick and a hand-made brick was that one was burnt and the other not. These gentlemen, be it said, were not architects' assistants, but practitioners who had carried off many honours and had designed many buildings. Of course, the architect's work is to specify, and so long as he gets the brick he wants he need not trouble himself as to how it is made or from whence obtained; but I take it that the fact of your secretary asking me to read this paper shows that you, at least, would like to know something of the art of brick-making. I do not intend to say anything about brick history. There is a very wise rule in force in the brickmakers' associations of the United States, that any member referring to the Israelites or the Land of Bondage is fined a sum not exceeding 50s. It will be more interesting to you to know something as to the manufacture of bricks in our own day. First, let us take what is known as the London stock. This is a brick familiar to still and, indeed, all Londoners. Its manufacture still survives in our suburbs, a fact of which our nasal organs supply the best indication. The London brickmaker, however, is fast being driven outside the confines of the Metropolis, not merely because of the nuisance he gives rise to, but that the land available is being rapidly taken up. Brickmaking as practised in London is of the most antiquated type. It is one of those



few forms that have survived the introduction of steam-driven machinery. For one reason, the clay is generally not of a suitable nature to be made into bricks in any other way than by hand, and this remark refers also to the Sittingbourne district. It is probable, however, that in a very short time you will find that machinery of a certain kind will be used in the manufacture of stock bricks. Another peculiarity of the London stock brick is that it is not burnt in a kiln, but in what is known as open clamps. These are courses of bricks set close, between which are placed layers of breeze or ashes. These become incorporated with the clay, and assist in burning. The setting of these bricks is quite a fine art, and has everything to do with the production of a good brick. The bricks are dried in the open air in "tracks." Many years ago there was a species of brick earth in London known as malm; but this has now been almost entirely used up, although a great deal of malming is still carried on by artificial means. This is done by mixing chalk with clay, which produces a very good brick. It is a method adopted by many leading stock brickyards near London. The brick next best known in London is, perhaps, the Peterborough brick. This is the great competitor of the stock brick. Of late years Peterborough as a brick-producing centre has developed to a remarkable extent, and great quantities of bricks come to London, the railway companies affording every facility. As an instance of the kind of output that these yards control, I might mention that one company alone at Peterborough has on hand an order for 90 millions. The clay at Peterborough is of a remarkable nature. It contains a large amount of shale-oil, which assists the brick in burning, in somewhat similar way as the breeze assists the stock brick. The bricks are made either plastic or semiplastic. These processes of manufacture I will explain later when I touch upon machinery. The red rubber is familiar to all of you. It is produced solely by brickmakers in the home counties, and it is, as you will have observed, a much larger brick than most. The denomination of "rubber" is given to it as it can be smoothed or rubbed up when required, which gives it brightness and finish. Another brick also familiar to you is the red sandfaced brick; these are principally made in Suffolk, Kent, Essex, and the Southern counties. The sandface is obtained by using a large amount of sand, which gives it its bright colour, and also the rough appearance, in favour with many architects. The great drawback to these bricks is the liability to sand-flaws. This specimen is a very good sample of a plastic brick which has been pressed in a machine; this is done when the brick is thoroughly bone-dry, and before it has been placed in the kiln. Another sample is of a hand-made brick, taken from King Richard's Castle, Carlisle; it is some 600 years old, and is a fine illustration of the handmade brick of a bygone day. It will be noticed that the manufacturer has not been very particular as to the substance incorporated with the clay. The blue vitrified brick is one very largely in use for purposes of paving, and for any use where hard wear is desired. Of course, it is not every clay that will make a blue brick. Staffordshire is the great centre of the blue brick industry; here the bricks are mostly made by the plastic process. The blue brick owes its colour to the peculiar nature of the clay, and to the mode of burning. As a rule, the clay contains a fair proportion of the following compounds: alumina, silica, and iron, which, when burnt, give that metallic tone to the brick that you will observe in the sample. There are very few clays in this country, outside the Staffordshire, that will stand the heat necessary to obtain the blue colour, without the bricks running or twisting entirely out of shape. Various attempts have been made to obtain the colour by artificial means, such as introducing manganese, ironstone dust, &c., in the kiln at certain stages, while the bricks are burning. On the Continent efforts have been made to a similar end by placing coal tar in the kiln amongst the bricks, or by introducing into the kiln alder or other wood at the last stages of burning, and preventing the escape of the smoke. It need hardly be said that the artificial method is not likely in any way to displace the natural process of manufacture. For example, here is a very good example of what may be called a "blued" brick in contra-distinction to a blue brick. This opens up a point that might be well worth your discussion, the possibility of using vitrified bricks

as a roadway paving material. In this very short paper it is impossible to go fully into the merits of brick paving over other systems; but I might point out that such a paving is practically un-wearable, and affords a firm foothold for horses. It is easily repaired, is cleanly, and eminently sanitary. Brick side walks have been used in various parts of the country with great success, and ordinary vitrified bricks, I might say in passing, make a most excellent footpath; those most familiar to you being the sea walks at Eastbourne and streets at Bexhill-on-Sea. These always look clean, make a hard path, and are very pleasing in appearance. A word as to glazed bricks. These have of late years, as you know, come very much into use, especially for internal decoration and for sanitary work. The glazed-brick trade in this country is a very important one, and one that is decidedly on the increase. The principal centre is Leeds, from whence, at least, half a million of glazed bricks are produced weekly. The manufacture of these may be briefly described as follows:—In glazed-brick making, the first essential is a fire-clay. The clay is suitably prepared and made into bricks, which are dried and then partly burnt. A first solution, or "slip," as it is called, is then applied to the brick. It is then allowed to dry, which occupies some days, and the brick is then dipped into the glaze. It is then placed in the kiln, and the burning is completed. The great difficulty hitherto in glazed-brick making is the obtaining of a clay that will expand or contract in the same proportion as will the glaze that is applied to it. It is the shrinkage that causes "crazing," which, as every architect knows, is the *bête noir* of the manufacturer of glazed bricks. The latest and most successful development in artificial glazing is what is called an "opalite" glaze, and you will see that it is a preparation of glass which can be cemented upon any kind of brick. It is about the nearest resemblance to the glazed brick that has yet been found. I may state that glazed-brick making is anything but an easy process. It requires a vast amount of care, and often years of experiment before a clay can be adapted to take a glaze. More money has, perhaps, been spent in experimenting in glazes than in any other way in the brick trade. The principal deposits of clay for glazed brick-making are found in the Leeds district, in North Wales, and Devonshire. Of recent years attempts have been made to adapt any form of clay to glazes, and I have a specimen here of a glazed brick made from Cambridgeshire gault. Here is also a smaller piece, showing the very latest development of glazing. In this case the brick is taken in the green stage, and dipped once only, when the brick is burnt. The patentee claims that he can glaze a London stock as easily as he can a Leeds firebrick; but these are matters of *quot erat demonstrandum*, as the glazing has not yet got beyond the experimental stages. One of the most remarkable features in connection with brick-making is the development of its machinery. It will probably surprise many of you to know that there may be seen at work in South Wales a brick machine turning out as many as 60,000 bricks from a single die in a working day of 10 hours. This at one time was considered a very fine output for a week's work. When I state that every bit of clay used in the manufacture of these bricks has to be got by blasting (the substance being a hard marl), you will understand that the clay is not an easy one to treat. At the present time the brickmaker does not find his difficulty in obtaining machinery, but in choosing from such great variety. Even the smaller brickmakers can obtain a sand-faced brick-moulding machine to work by hand, whilst for those in a larger way of trade there is machinery to avoid any handling of the clay from the time it is taken from the pit and placed in the clay wagon until it is taken on to the table from the machine, ready for the kiln or drying shed. It would take up too much of your time for me to describe the various forms of machinery. The two principal methods of working clay in this country are upon what are known as the plastic and semi-dry processes. I append some particulars of each method of manufacture. The former refers to the yard in South Wales having the large output previously mentioned. From the marl hole the clay is drawn in a wagon containing material sufficient to make 600 bricks up a steep incline by means of a flexible steel rope, worked by a winding engine, and running at a high rate of speed. In this way the clay arrives at the top floor of the mill-house, and is automatically tipped into a

hopper, which feeds a pair of steel-barred rolls (or kibblers), and from these is delivered into a pair of large, smooth rolls, set close, and from thence into the tempering apparatus, where the necessary water is added. The clay then passes through a vertical pug, and after that through another pair of smooth rolls set quite closely together, and from them into the machine. The clay now being reduced to a perfectly plastic condition is forced from it through the die. The bricks are cut off in tens, and at the same time are thrust forward on boards, which are then placed by men upon bearing-off barrows and carried to the drying-floors. They are then deposited by boys, ten at a time, on their ends, where they remain until dry enough to set in the kilns. These drying-floors are principally in sheds, which are heated by means of flues underneath the paving, which is of brick. One of these sheds is 163ft. long and 62ft. in width, having ten fireholes, which serve the 70 flues that run the whole length of the building. The motive power is supplied by a large Lancashire boiler, working at 100lb. pressure to the square inch. The following is a description of a clay as worked by the semi-dry process: The shale is brought from the pit in wrought-iron waggons to the machine house, and heaped on an iron floor. From this it is fed into a 9ft. diameter perforated grinding mill, revolving at 30 revolutions per minute, and here it is subjected to the crushing action of two rollers weighing two tons each. Passing through the perforations of the pan, the ground material drops through the open base of the mill into the foundation, which is 14ft. deep, and is gathered by inclined surfaces to the elevator. This elevator is 40ft. long, and conveys the ground material from the pit under the mill to the very ridge of the roof, and from this point it falls by gravitation through the various machines until it emerges ready for the kiln. From the top of the elevator the dust first falls through shoots into a sieving arrangement. Here the fine is extracted and the tailings returned to the grinding-mill to be further reduced. The fine dust then falls through a spout into the mixing mill, 9ft. diameter, where the moisture is thoroughly incorporated with the ground shale, which is well rolled and toughened. The effect of this part of the machinery is to increase the plasticity of the ground shale, but still to preserve its pulverant form, so as to feed down the trunks into the brick machines. The dust, after being mixed and damped in this mill, falls on to the floor over the brick machines, into the hoppers of which it is then fed. The dry press system is not very much in vogue in this country, but is largely adopted in the United States. The preparation of the clay is pretty much the same as that previously described as the semi-plastic process; but in the dry press machine the clay is not moistened in any way. The machinery used is capable of exerting tremendous pressure upon each brick. Another improvement that has made much headway is the introduction of the kiln for burning bricks. Brick-burning has now become a fine art, and the burner has as much to do with the production of a first-class brick as has any other person employed in the yard. Very soon the system of clamping will be a thing of the past, and every yard will have its kiln, however small. In all new works at the present time the question of the kiln is of as much importance as the selection of machinery. I mention this, as possibly many of you have never had an opportunity of inspecting an up-to-date yard; and you must not think that the system of brickmaking as carried on around London is anything like that practised by our leading firms. The principal kilns in use for the manufacture of common bricks in all parts of England, with the exception of London, are those upon the continuous system, generally known as the "Hoffmann" kiln. These are either circular or oval in form, and very much resemble a tunnel. The bricks are set in the kiln, and then divided into sections. By an arrangement of the flues, when one part of the kiln is cooling off, after the bricks have been burnt, the heat coming from the bricks is conveyed to another section of the kiln, where the goods have just been brought in. By this means a great economy is effected, as no part of the heat coming from the bricks is wasted. The fire is lighted first from the side, and is fed continuously from the top of the kiln, dust coal being introduced among the bricks in small quantities at regular intervals. This form of kiln burning is adapted for common bricks, and there are many varieties and patent improvements upon the



system. Facing bricks, terracotta, and such like work is generally burnt in a circular kiln known as a "Beehive." Different towns and places throughout the country have at different times given a name to different forms of kilns. Thus we have the "Manchester," "Suffolk," "Newcastle," "Cardiff," "Staffordshire," and others, most of which have been built to suit the requirements of their respective districts. Attempts have been made to burn kilns with gas, but so far this form of burning has not proved satisfactory. Our American friends, who are generally a little ahead of us (or think they are), state they can burn their kilns by electricity, but so far we have no definite proof that this has been accomplished. In many parts of the United States oil and natural gas have been used for burning with great success. In conclusion, I should like to call your special attention to the fact that at the Institute of Clayworkers, 222, Strand, there may be seen almost every sample of brick manufactured in this country, together with samples from America, Canada, Germany, and from various parts of the Continent. The institute is open daily for the inspection of these samples, and there is always somebody in attendance to point out features of interest, and to give any particulars that may be required. I need hardly say that if any of you gentlemen like to call at this institute, you will have a welcome at any time.

The CHAIRMAN said it seemed to him a very small proportion of clay was used in the London stock brick, the contents of the dustbins being largely utilised in its manufacture. The day of the stock brick seemed to have gone by in London, as it was being rapidly superseded by the Fletton brick. The latter was all very well for internal work, but did not as a rule stand the weather well. The brick industry in Peterborough was increasing by leaps and bounds. A few malms were still made in London, particularly in High-bury, where good yellow ones were turned out. For London board schools shippers were largely employed, and wore well. Glazed bricks were being increasingly used, and there was now coming in a cheap salt-glazed brick, with a continuous frog, which was glazed all over, and these needed some care and skill in laying. In his own practice he used a large quantity of bricks from Thomas Lawrence, of Brackley, which could be supplied in almost any required colour. For plinths to buildings next the street glazed brick should always be specified; an instance of the injury caused to soft brickwork in rough neighbourhoods was afforded by the lower portion of St. Columba's Church, Haggerston, which had been greatly chipped and disfigured by boys.

Mr. G. A. T. MIDDLETON proposed a vote of thanks to Messrs. Montgomery and Marsland, remarking that the latter part of the too short paper was very practical, dealing as it did with matters unnoticed by the ordinary trade handbooks. Salt-glazed bricks were being largely used in Yorkshire, but the surface was non-adhesive. In Belgium they saw a very small brick with rather rough surface used, which suited the Free Gothic treatment still in vogue in Bruges and district. Close to the Rhine railway from Cologne to Heidelberg they saw made in large quantities a species of concrete brick which was light, porous, and strong, and well adapted for use in partition work, as nails could be driven into it. The use of vitrified brick for crossings and pavements was much favoured on the Sussex coast; but it made a noisy street, and soon wore into holes.

Mr. H. G. QUARTERMAIN, who seconded the vote of thanks, defended the clamp brick, remarking that its only defect was the difficulty of insuring an even quality, some bricks in the centre of a clamp being vitrified, while those near the outer edges were under-burnt. He described at considerable length the process of manufacturing bricks in the clamp as carried on near Southend.

Mr. HORATIO HOLMES said the Fletton bricks, from their cheapness, were commanding the market in London. A grave fault was that they often contained lumps of lime, which in wet weather would slake and burst the surface. Pressed Fletton bricks were, he considered, useless for facings, but wire-cut bricks were all right. In his judgment, nothing could beat for wear in London the stock brick.

Mr. ATKINS remarked that railway engineers made an extensive and increasing use of Staf-

fordshire bricks set in cement for retaining-walls and bridge abutments, and found them answer admirably. Glazed bricks soon got dirty in London, and when washed, the foul water got behind the glazed surface, producing an unsightly smear. A good test of the glazing was to apply red ink to the face and free edges of a white brick, when, if porous, the colour would soon soak through.

The CHAIRMAN, in summing-up the discussion, said the thin Belgian bricks looked very well in walling; but when used for strings and mouldings the effect was coarse. A few years ago they were told by a maker of concrete bricks similar to those used on the Rhine banks that they would revolutionise London building; but this had not been the case at present. The great fault with Flettons, of which there were several good qualities in the market, was their liability to flake off, and this was probably due, as Mr. Holmes had suggested, to the free lime the contained.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE tenth ordinary meeting of the Institute for the present session was held on Monday night, Mr. Aston Webb, vice-president, in the chair. The death was announced of Mr. James Abernethy, F.R.S.E., past-president of the Institution of Civil Engineers, who had been an honorary associate of the Institute since the establishment of that class in 1877.

#### SAINT PIERRE-ES-LIENS: THE ANCIENT CATHEDRAL OF GENEVA.

Two papers on the history of this little-known cathedral church and the restoration at present in progress therein were contributed by M. Louis Viollier, of Geneva, and Mr. Lawrence Harvey, F.R.I.B.A., and were read in the absence of the authors by the Secretary. The papers were illustrated by a large scale plan and section of the cathedral, drawn by Mr. Harvey (who has also translated M. Viollier's paper from the French), and also by a unique collection of between fifty and sixty photographs of the figure and foliage sculpture, the clustered columns and other details of the cathedral, specially taken for the occasion by Pastor Weber, of Geneva, and presented by Mr. Harvey on his behalf to the Institute.

In his paper M. VIOLLIER (who is the architect for the cathedral restoration) described the plan and general features of Geneva Cathedral as it now exists. Only twenty or twenty-five years ago Saint-Pierre was, M. Viollier explained, in a dilapidated condition and of little architectural interest. The chapel of the Macchabées had been cut up into three stories, and was externally devoid of ornament. The windows of the nave had lost their mouldings, sills, and small columns. The Gothic outlines of a 15th-century cornice had been given a touch of Renaissance in the 18th century. The aisles were disfigured by broad, shallow buttresses, on which rested abutments loaded with heavy semi-vaults, their convex sides turned down. Various restorations described by the author were carried out in 1856, 1875, 1884, and 1888, and in 1890 the general restoration of the church was decided upon. In carrying out this work the responsible authorities had elected to follow Viollet-le-Duc's definition of the term "restoration," which they interpreted thus: Wherever legible traces of primitive periods had survived the wear and tear of time, those traces must be carefully preserved and repaired regardless of their want of harmony with the buildings. The parts of the edifice of which there remained no traces, and which had to be designed afresh in order to complete the building, should be designed either in the general style of the building, or in the style of the parts of the building the new structures had to complete. The [London] Society for the Protection of Ancient Buildings, in 1890, had entered an energetic protest against the restoration plans. The Genevese authorities, however, felt it their duty to go on with the work. They must either rebuild, or allow the cathedral to fall to pieces. Decay had set in, and a sudden general collapse might not improbably occur. The walls, built of a soft stone (*mollasse*), were crumbling away; the foundations were badly laid, the buttresses weak, the vaults split up. Restoration on the lines suggested by the well-meaning London S.P.A.B. was impracticable. They urged that whatever was artistic, picturesque, and historical should be preserved. M. Viollier would answer that walls

which had lost all their architectural features had ceased to be artistic; that the provisional roofs which protected the incomplete towers might be picturesque, but had no right to remain in a finished building. He had therefore decided to complete the towers in the latest style of Gothic, and to build the long-intended spire over the crossing. Had the cathedral reached the irrecoverable stage of a picturesque ruin, the Genevese would willingly have given way before the appeal of their London friends. But Saint-Pierre must stand. It was the monumental embodiment of Genevese patriotism. It its walls Geneva's religious enfranchisement and republican liberties took their origin. It was a craving of Genevese patriotism that the witness of the republic's long life should be kept in condition to hand down the same patriotic feeling to posterity. M. Viollier then vigorously discussed various objections raised by the S.P.A.B. against the scheme of restoration decided upon, pointed out errors and defects of former restorations which demanded immediate remedy, and entered into details of the restoration works now in progress. The removal of parts laid open to view many a detail giving evidence of the former state of the building, and thus the partial destruction had been, he claimed, the guiding-star for a truthful archaeological reconstruction.

In the second paper read, Mr. LAWRENCE HARVEY gave an historical account of the City of Geneva from the days of the Roman dominion to Mediaeval times. With regard to the Cathedral, the interior looked very much larger than it really was, in contradistinction to St. Peter's at Rome, which seemed smaller than its actual dimensions, and the author had recently made a careful survey of the building, in order to discover how this optical illusion had been obtained. A peculiarity in the plan was that the nave was divided by bays into square spaces, and the aisles followed suit, with vaulted spaces covering narrow rectangles. This peculiarity, the author considered, was due to the fact that when the building was laid out only a timber roof was contemplated. Confirmatory evidence of this was shown in other features of the church; for instance, in the absence of buttresses to resist the thrust of the vaulted ceiling. A print of 1749, drawn before the erection of the portico, showed that the west front was formed of a plain wall, relieved only by shallow pilasters. That the wall did not come down as soon as the vaulting was completed was doubtless due to the material used in the vaulting. On removing some of the plaster from one of the ceilings in the nave, the cells were found to be filled-in with regular courses of tufa, arranged according to the French plan, cross and diagonal ribs being divided into an equal number of parts, and each part connected by a course of stones supported by a board on edge out to a curve. The rise of the curve is, at Geneva, 8 in 100. The spongy texture of the tufa offered a very firm grip to mortar, and it was probable that long before the centring of the arches was removed the vaulting formed a nearly homogeneous cake, like a vault executed in concrete. Mr. Harvey next dealt with the piers, capitals of shafts, and the vaults above the aisles, explaining the reasons for the variation in shape and construction of the ribs, and indicating parts where changes in the management of the works had occurred. The architect responsible for the erection of the transept and the vaulting must have been, the author considered, a genius of a very high order. His aim was to give the church the impression of vastness for which it was so remarkable. Everything had been knowingly designed to produce this optical illusion, and his artifices could be followed step by step. This remarkable effect of apparently extending the length of the building had been brought about (1) by lowering the horizontal lines of the triforium and the clerestory in the apse; (2) by using small features in the apse; (3) by attenuating the proportion of certain features in the choir taken from the nave; (4) by avoiding breaking up the nave in several successive bays right through the vaulting; (5) by a very clear and determined effort at lightening the arch which separated the apse from the choir; (6) by the rise of the pavement from the western entrance to the choir. Having discussed and illustrated these and other methods employed to give the appearance of spaciousness, the author concluded with a few observations on the Corinthian portico, put up in 1750 to replace the Mediaeval Gothic front then threatened with destruction. The Classic portico to a Mediaeval fane had been condemned



as in barbarous taste. Incongruous it was; but the evil was reduced to a minimum, as the portico and the Mediaeval building could not be viewed simultaneously. The portico was, in Mr. Harvey's opinion, by far the finest monument of the kind in existence, eclipsing any in Rome, Paris, or London. It was designed by Count Alfieri, a barrister and amateur architect, and the uncle of the well-known poet of the same name, who happened to be in Geneva when the reconstruction of the façade was under consideration. He took three months in the preparation of his design, and would accept no payment for it. In the present restoration the portico will remain undisturbed.

Mr. WILLIAM WHITE, F.S.A., in proposing a vote of thanks to the authors of the papers, said the designer of the beautiful and simple plan of Geneva Cathedral evidently based his work on the square and equilateral triangle, as was so usual in all European work of the same period, and the transepts showed a modification of the same principle. The ingenuity with which the exaggerated effect of spaciousness in the internal perspective had been attained was great, and had been well brought out by Mr. Lawrence Harvey. The inequality in setting out the pillars was very usual in Mediaeval planning, and was apparently adopted to avoid uniformity. A feature that had not been alluded to was the continuous range of triple lights in the clerestory, the central opening being considerably the loftiest and widest—a detail which was very fine in proportions and effect.

Mr. GEORGE AITCHISON, A.R.A., did not quite agree with the authors as to the desirability of what was humorously termed "restoration." If we had an architecture of our own we should build in the style of the day, but as it was, we attempted to copy older work. In reproducing the lost carvings, for example, of that cathedral, it was quite impossible for the designer to put himself in the exact mood of the original craftsman, whether that early worker were more barbarous or more refined; indeed, the essay to reproduce early carvings would be quite comic. Any new work should be obviously of 19th-century character. He hoped that the views he had expressed, and which, he believed, were generally held in that room, would be conveyed to the authors of the papers, for he held that the works described ought to be stopped.

Lieut.-Col. LENOX PRENDERGAST thought the authors had dealt with the subject in a truly scientific spirit. He knew the cathedral, which, to his mind, was, before the restoration commenced, in a deplorable state of dilapidation; it was not generally inspected by visitors to Geneva, for it occupied a high-lying site in the old part of the town, and was closely surrounded by ignoble buildings. There was no evidence for the charges of Vandalism which had been brought against M. Viollier, and the fact that the Genevese authorities had determined to leave intact Alfieri's portico of 1749 showed that their scheme was truly conservative, and that their architect ought not to be censured without further evidence. Even if they were anxious to have a metal flèche, and were prepared to pay for it, he did not see why British architects should endeavour to stop them.

Mr. W. EMERSON asked Mr. Aitchison if, in arguing that any additions should be clearly of 19th-century character, he intended to suggest that M. Viollier should incorporate details taken from the Forth Bridge, the Crystal Palace, or, say, terracotta structures.

Professor AITCHISON replied that he was referring to carving and ornamental details, and not to structural additions. He was not sure, however, but that it would be as well to insert details from the Forth Bridge and Crystal Palace in works of restoration, as it would exemplify the relative taste of the present day and the date of erection.

Mr. THOMAS BLASHILL said he had visited Geneva Cathedral on many occasions during the past five-and-twenty years, and had never seen the beauty of the carvings so well brought out as in the photographs presented by Pastor Weber. The capitals containing figure subjects much resembled in character those at Vézelay, while the foliage capitals were vigorous and graceful. He agreed with Professor Aitchison that any attempt to reproduce carvings to fill the vacant spaces would have a comic effect and be meaningless. As for the general restoration, the architects had shown that they understood the build-

ing and their business exceedingly well, and he should be slow to interfere with them.

Mr. W. WHITE added that it would be iniquitous to touch the carvings and sculpture.

The vote of thanks to Messrs. Viollier and Harvey, to which the CHAIRMAN added the name of Pastor Weber, was then carried by acclamation.

## NOTES ON DOMESTIC DRAINAGE.—VII.

### INSPECTION-CHAMBERS OR MANHOLES.

It is desirable that the junctions of all drains may be effected within a chamber specially constructed for that purpose, the portion of the

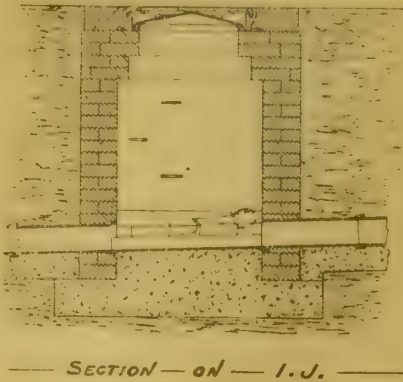


Fig. 18.

drains and branches within the chamber being formed with open chambers.

A series of such chambers should be so arranged that the whole of the drains within the system are accessible by means of drain-rods. Any obstruction can then be readily removed from the drains, if necessary, without incurring the expense and inconvenience of opening up the drain. These inspection-chambers also afford every facility for a periodical examination or testing of the drains when required.

A convenient size for ordinary inspection-chambers is 3ft. by 2ft. 6in. This allows sufficient room for a man to work conveniently therein with drain-rods. In places where the change of direction of the flow of sewage is at right angles to the previous direction, it is better to make the inspection-chambers 3ft. square. When over 8ft. in depth, the upper portion of the chamber is contracted in size, by constructing

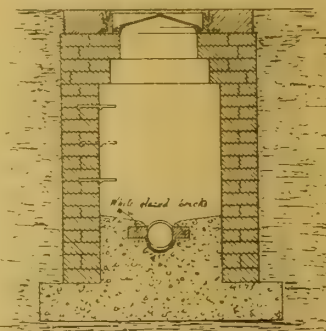


Fig. 19.

an arch at a height of about 5ft. above the concrete bottom, an access-shaft 2ft. 6in. by 2ft. in the clear being carried up from the soffit of the arch to the surface of the ground.

Figs. 18 to 21 show the details of construction for an ordinary inspection-chamber, through which a 6in. main drain is passing, and receiving the discharge of three branch drains. The foundations for the chamber are of Portland-cement concrete, the sides being built with white glazed bricks set in cement. If white glazed bricks cannot be used, on the ground of expense, the sides of the chamber may be built with carefully-selected ordinary bricks of a hard impervious description. The sides are sometimes rendered in Portland cement, and afterwards limewhitened.

The open channels should be formed with the best white glazed stoneware channel pipes, bedded and jointed to proper falls in the concrete

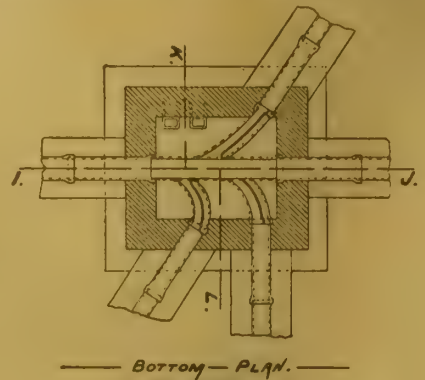


Fig. 20.

bottom. All branch channels must be arranged to discharge over the edge of the main channel, in order to avoid any back-flow or wash. Branch channels should never be permitted to discharge

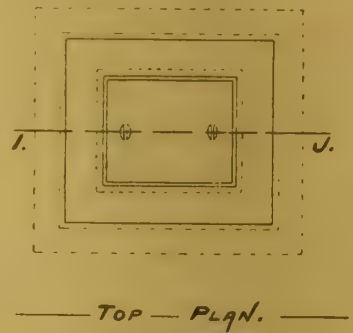


Fig. 21.

directly opposite each other, as this is a great source of splashing, should the branches discharge their contents together. The proper arrangement is shown in Fig. 20. It is necessary to



Fig. 22.

give the branch channels as large a sweep as possible, so that the direction of the flow of the branch may be gradually given the same direction at the point of discharge as that of

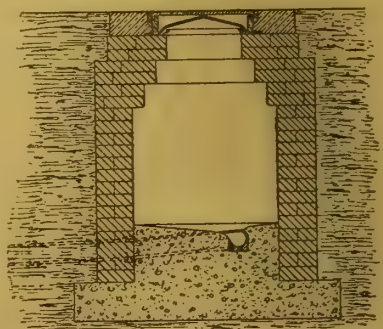


Fig. 23.

the main channel. Open channel pipes of a flat sweep may be semicircular in section; but for channels having a fairly quick sweep, it is desirable that the bends be of three-quarter pipe



section, as shown in Fig. 22. These must be so laid that the *outer* edge of the bend is higher than the inner, in order that the discharge, when passing round the bend, may be folded over like a wave and turned in the direction of the flow of the main channel.

The concrete bottom of the chamber must be *benched* or sloped to the same height as the top of

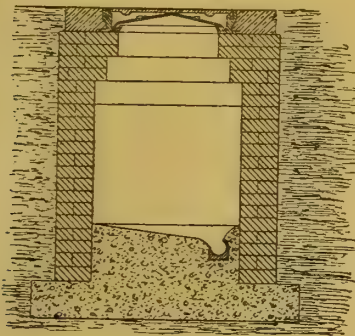


FIG. 24.

the drain-pipes discharging into the chamber, the benchings being formed so as to slope towards their respective channels, and neatly finished to a smooth face with cement. The slope of the benchings should be flat enough to permit a man to stand conveniently on them. It is a great improvement to lay a course of white glazed

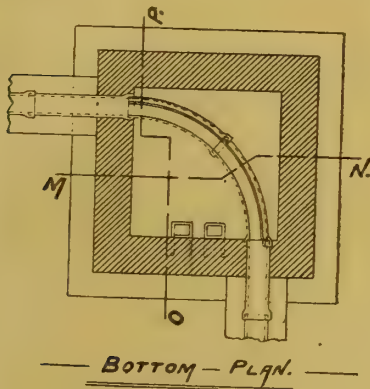


FIG. 25.

bricks along the sides of the main channel in the spaces between the branch channels, as shown in Fig. 19.

For convenience of access, the top of the chamber is covered with an iron cover and frame, and galvanised ladder irons (spaced about 12in. apart) are built into the sides. For ordinary

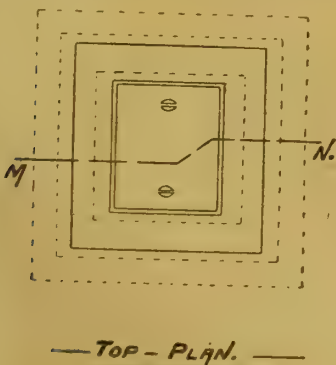


FIG. 26.

air-tight, and in such cases a "double" manhole cover may be used with advantage. Where drains are carried round the angles of buildings, it is

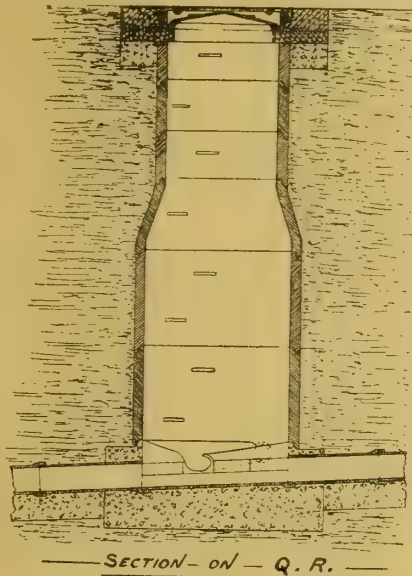


FIG. 27.

desirable to construct a square manhole about 3ft. square, as shown in Figs. 23 to 26. Inspection chambers, circular on plan, are frequently constructed of "rock concrete tubes," as shown in Figs. 27 to 30. Where these are used for house-

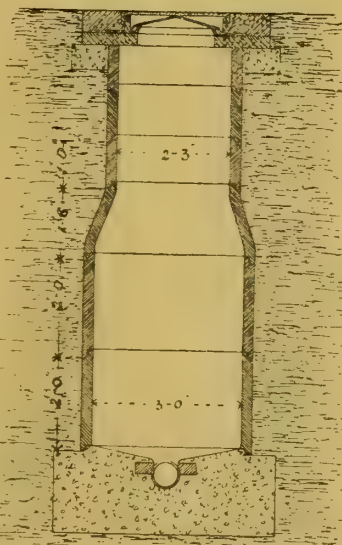


FIG. 28.

drains the lower portion of the chamber is 3ft. diameter, the upper portion being reduced to 2ft. 3in. diameter, by means of a specially-made taper piece. Ladder irons are built into the sides

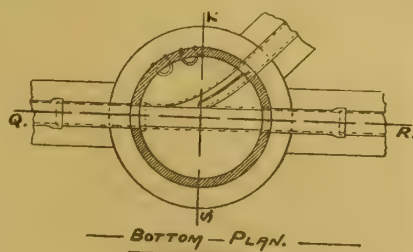


FIG. 29.

of the chamber, convenient apertures being left in the tubes for that purpose.

#### INTERCEPTING CHAMBERS.

It has already been stated that the domestic drainage system must be properly disconnected

from the public sewer at some convenient point near its junction with the latter. This disconnection is effected within a chamber constructed for the purpose, so as to admit of examination at any time. The general arrangements of an ordinary intercepting chamber have been shown in Figs. 2 to 5, and also in Figs. 6 to 9. The details of construction are similar to those described for inspection chambers, with the addition of an intercepting trap at the outlet of the drain, and adequate provision for the continuous supply of fresh air to the drainage system.

It is necessary to select a well-designed self-cleansing intercepting-trap; otherwise the drain

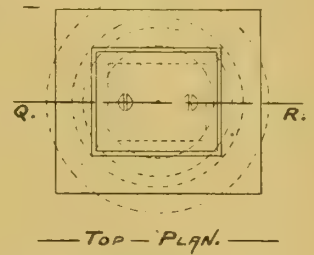


FIG. 30.

will be liable to constant stoppage at this point, and prove a continual source of annoyance and expense. The intercepting-trap must be set perfectly level. To insure this, it is usual to bed a piece of 3in. York paving on the concrete, the upper surface of the slab being bevelled to receive the trap (see Fig. 6). A cleaning arm fitted with a movable cap is provided to the trap, so as to allow of access to the drain on the other side of the water seal, if desired at any time. It is important, however, to make sure that this arm is properly sealed and made airtight when the drain is not undergoing examination.

#### COUNTY LUNATIC ASYLUMS.—XLI.

By GEORGE H. BIBBY, F.R.I.B.A.

##### DISADVANTAGES OF LARGE ASYLUMS.

OF all the improvements in the designing of asylums, none are so desirable as those which provide for buildings in which it is practicable for the officials to give the patients a maximum of individual attention. Large wards, in either large or small asylums, are necessarily the most economical, but, at the same time, the least efficient means for the housing of the insane. By reducing the number of inmates of the wards, the troubles occasioned by noisy or violent patients necessarily discomfort a reduced number of other patients; if a patient be of filthy or objectionable habits, it is obviously desirable that he should be seen as little as may be by others than the nurses or attendants.

The question as to whether the asylums and wards should be large must continue to be purely a financial matter as regards institutions for the poorest insane, and it is to be regretted that, in spite of the enormous sums expended upon modern asylums, it should remain impossible for the patients of the poorer classes to receive that careful *individual* attention which could only be advantageously given in rooms of moderate area, and by a sufficient number of officials.

The question as to how far it may be desirable for public authorities to take charge of all insane persons, both rich and poor, is one that is not unlikely to come before us, and there would appear to be no reason why, in such an event, an asylum planned upon a combination of the villa with other systems should not be adopted. For instance, a great public authority possessing a large estate in connection with an asylum might possibly, with advantage to all parties, consider the advisability of providing accommodation in one set of villas for the insane of the wealthy classes; within the same grounds another set of buildings might be erected for the use of those patients whose friends might be able to pay but a moderate sum; a third set of villas being for the housing of those patients with very limited means, and only able to pay temporarily a small sum for the cost of their care and maintenance; while those absolutely dependent upon the public charity would be housed according to their degree and with the requirements of their station. Each



of these four classes would reside in separate buildings, would be unassociated with each other, and have their special attendants, nurses, and surroundings in proportion to their condition in life, and each department having its special officials and attendants, who would be under the control of a chief medical superintendent, who would visit all the houses, and be governor of the whole community, both rich and poor, and, in fact, would require to be a specialist of ability, whose duty would be to advise with his junior officers in charge of each class in all cases of difficulty.

The houses for the paying patients would be furnished and regulated with that degree of luxury and comfort to which the occupants had been accustomed prior to their admission, and any profit that might arise could be properly applied for reducing the cost to the public of the housing and care of those patients contributing little or nothing towards their board, lodging, and care.

Being in the hands of a public authority, the villas for the wealthy insane would be occupied by patients who, while paying a liberal amount, would not be subject to that risk of unduly lengthy detention which might occasionally—but, probably, seldom—arise by reason of a temptation not to part with a remunerative patient until the latest possible moment. The safeguards against such a state of matters at the present, although probably considerable, are not so great as to render an additional precaution unwarrantable.

In deciding as to the size of a new asylum, the extent to which individuality of the treatment of the patients is proposed to be carried would considerably influence the arrangements of the architect, and in the matter of cost an eminent authority states: "About the smaller weekly cost per patient in large asylums there can be no doubt. Taking ten of the largest and ten of the smallest asylums from various parts of the country, the former with an average of 1,600 patients, the latter with an average of 360, the difference in favour of the former is nearly eight per cent. If we examine the capital outlay on land and buildings, we find that the cost per patient of the small asylums is five per cent. greater than that of large asylums. These differences are considerable, and in rate-supported institutions, not only cannot they be disregarded, but it would require very cogent reasons to outweigh them." It will, therefore, be perceived that amongst the leading reasons for the erection of large asylums (for so many as 2,000 patients each) may be included reduced cost of the buildings and maintenance of the patients, and certain advantages of equipment more economically obtained for large than for small asylums, and the facilities for the employment of working patients upon more varied occupations than otherwise would be profitable or expedient. The disadvantages of large asylums and large wards include difficulties of the officials connected with them obtaining a complete knowledge of the peculiarities, dangers, wishes, and constantly-changing conditions of the patients, both as regards their bodily and mental health; for even if the numbers of attendants and nurses be correspondingly increased with the numbers of patients kept in large wards; yet the circumstances of mixing many patients in different conditions of health and temper cannot but tend to militate against the prospects of those speedy recoveries that might otherwise be obtained, especially by patients who require quiet and careful observation and treatment in apartments of moderate area alone to perfect their restoration to mental health.

In the asylum at Munich, of which I have given a plan, there is upon each floor a very large number of apartments, none of unduly large area, and the means for the separation and classification of patients compare favourably with those of many English asylums which have been erected with large wards, now filled with numerous patients, all liable to be excited or disturbed by one turbulent one. But there can be no doubt that the constantly increasing numbers of the insane and considerations of cost will continue to influence architects and asylum-building committees to increase the size of asylums, and to discourage the erection of those institutions of moderate or small size, which, upon the whole, would be best adapted to the needs of the insane, and most likely to contribute to their recovery.

Another point of interest to the asylum architects is that, if an asylum be planned to receive,

say, 2,000 patients, and if 300 new cases are admitted every year, that the resulting labour and responsibilities of the officials would be less in many respects than those existing at an asylum for 1,000 patients where 500 new patients are admitted annually; for while the old cases can be cared for without great trouble, the new, unknown, and possibly highly dangerous patients have to be carefully studied and watched, and it is at the earlier stages of insanity that the prospects of recovery are more favourable. Those patients whose cases are hopeless, and who have become permanent residents, may as a rule be both housed and cared for at a less cost to the community.

One of the disadvantages of a large asylum is, that being usually for the patients of a considerable district, their friends residing at a distance have less favourable opportunities for visiting their relatives, especially if of the poorest classes of the population, the time and cost of the journey being a deterrent. Also the attendants and nurses are in like manner at a similar disadvantage when taking advantage of the leave of absence periodically allowed to them; a large asylum also requires a large estate, and large estates are frequently only to be economically obtained at very inconvenient distances from town and railway stations.

The proposed erection of an asylum for the insane near to, or in, the best suburbs of a city has occasionally been greatly objected to by the suburban population, as would have been a fever or smallpox hospital; but there are cases where the erection of an asylum, even of great size, might become a permanent advantage to such a district. For instance, in many cities there may be large public parks, on one or more sides of which estates may exist, "ripe" for speculative and other builders, and whose operations might destroy all the beauty and picturesque surroundings of the park.

If a site be purchased, say, of three or four hundred acres, for a large asylum adjoining a public park, much of the land (especially at the boundaries) might be laid out in gardens for the use of the patients, and the planting of trees and shrubs over so large an estate would necessarily afford a highly-desirable adjunct to the public park, which might otherwise be spoiled by the erection on adjoining land of closely built-up streets.

A striking instance of the advantage that might result from the erection of a large asylum on such a site is suggested by the position of that portion of the Hampstead Heath which lies between North End and The Spaniards, and which preserves, as yet, its natural beauty. Beyond the boundary of the Heath, at this point there is at present a great extent of open fields (without buildings of any description), possessing all that is desirable for the site of a large asylum. If it could be secured for this purpose, the estate might become a permanent "buffer" against objectionable building operations upon open fields now adjoining the most rural part of Hampstead Heath. Amongst the advantages of this site are a sandy subsoil, an inclination of the land towards the south, its secluded position from public roads, open prospects, and such a moderate distance from London as would enable the patients' friends and attendants to obtain easy access. The question of obtaining a site for yet another asylum for London is, or has been lately, under discussion; but it is improbable that there can be any site so near to London with so many advantages as the one beyond Hampstead Heath, and the chief difficulty would probably be the cost of the land; but if the permanent benefit to the Heath be taken into account, this might not be considered to be a serious difficulty.

In a former paper I directed attention to the question of the advisability of laying down a siding from the nearest railway during the erection of large asylums; these may occasionally be conveniently and economically retained for the purpose of conveying stores to the institution after completion. Such a railway siding is about to be laid for the new asylum at Winwick, near Warrington, where the buildings are to be erected in a very fine park situated about four miles from the town. The site is very beautifully wooded, and the buildings when erected will be near its centre. This estate, being bordered by handsome trees in every direction, the residents of the district should congratulate themselves that the land is not to be used for manufacturing purposes or cut up into streets for dwelling-houses.

(To be continued.)

#### THE SURVEYORS' INSTITUTION.

At the ordinary general meeting of this society at 12, Great George-street on Monday evening last, two short papers were read on the subject of the "Light Railways Bill," now before Parliament.

The first paper, by Mr. A. C. Pain, fully set forth, almost in the words of the Bill, the provisions which it was proposed should be embodied in an Act for the promotion of what a subsequent speaker called a "tertiary" railway system in England. Clause 1 provided that three commissioners should be appointed to carry out the Act, one of them to be paid a salary not exceeding £1,000 a year, the appointment of subsidiary officers to be left to the Board of Trade. The second clause provided that any application for authorising a light railway might be made by any county, borough, or district council, or by an individual corporation or company, or jointly by such bodies and persons. By clause 3, the council of any county, district, or borough might construct and work such railways, or advance money for the purpose, or join other bodies or persons in so doing, under certain restrictions. Clause 5 provided that where it was certified by the Board of Agriculture that the proposed line would benefit the agricultural interests of a district, or by the Board of Trade that facilities would be given between a fishing port and a market, then the Treasury may make advances under certain conditions, either as a free grant or as a loan. Clause 6 limited the total amount of such advances at one time to one million pounds. Clauses 8 and 9 gave the Board of Trade the power of considering any order with reference to expedience and the public safety. Clause 11 contained important provisions enabling the Board of Trade to regulate the composition and powers of the managing bodies of the proposed light railways, and for auditing their accounts and fixing their charges and fares. Clauses 12, 13, and 14 dealt with exceptions to, and exemptions from, the provisions of the Lands Clauses Act, and decided that the Arbitration Act, 1889, should apply to any arbitration under that section. Clause 15 empowered a county or district council to pay any expenses incurred in the exercise of their proposed powers. After dealing with Clauses 16, 17, and 18, which dealt with administrative details, the author went, somewhat at length, into the provisions and details of the Bill which affected Scotland only, the different terms and the substitution of the Scottish for the English legal phraseology being duly set forth. The author then, in commenting on the Bill, proceeded to deal with it clause by clause. He doubted very much the desirability of having one paid member of the Commission and two unpaid members. The three commissioners must be men skilled in all the legal, engineering, traffic, and financial questions involved, as well as being called on in many cases to act as mediators between the conflicting interests of the promoters and the opponents of a projected light railway. He thought Clause 3 most valuable in principle, but difficult to carry out in practice. The rating area was too large. Railways, as a rule, in practice, generally followed the lines of valleys on one side or other of a stream, and as that stream frequently formed the boundary-line between one district and another, the line would run at the edge of a district, and the majority of the representatives of a rural council would not consent to tax themselves for the sake of the small minority, whose interests lay along the border line. With the financial proposals of the Bill the author found little fault, but he thought the Board of Trade should first have the details of a projected scheme laid before them, and then decide whether it should go to Parliament or the Commission. In conclusion, he expressed an opinion that the Bill, if carried, would enable those desirous of constructing such railways to extend the benefits of free communication to all parts of the country, and would tend to encourage agriculture and bring back the population to the rural districts.

Mr. A. E. Christy, in a supplementary paper, set forth some of the objections which he thought, in spite of their probable usefulness, might be urged against the proposed system of light railways. The primary object seemed to be not so much the carrying of passengers as the cheapening of the carriage of goods—of "light produce," such as poultry, butter, eggs, fruit, and milk. But this cheapening of transport must be at the expense of the producers in the more favoured districts, unless new markets could be found for



the produce. Highly-rented producers near towns or market centres would be subject to the same sort of competition, on a smaller scale, as that which, coming from abroad, affected all our home agricultural industries. The line would also, if assisted by the rates, be made principally at the expense of the more lightly-rated districts, which would suffer from this competition. The trains which brought the farmers' produce to market would return with foreign meat, flour, eggs, and butter. Even now it did not, in many places, pay to grow corn within a few hundred yards of a railway station on a main line, and it was difficult to see how the proposed system would improve the prospects of agriculture in this direction.

A discussion followed, in which Mr. J. W. Batten, Mr. C. Oakley, Mr. W. H. Acworth, Mr. P. W. Meik, Mr. C. J. Owens, Mr. J. B. Walton, and Sir George Leach took part, and the proceedings closed with a unanimous vote of thanks to the authors of the two papers.

### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XIII.

By ERNEST A. E. WOODROW.

NEARLY all the large hotels erected in London in the last 20 years have been provided with an assembly-room suitable for all classes of entertainment, such as concerts, dances, banquets, and private theatricals. It is therefore only natural to find that the largest hotel in London, which is now approaching completion, should have one of the largest assembly-rooms of any in a building of this class. I refer to the Hotel Cecil on the Embankment, the building whose history is well known to every Londoner as being one of the many schemes in connection with the famous Jabez Balfour companies.

Messrs. Perry and Reed, the architects of this building, are rapidly completing the work which they have from the commencement carried forward with such energy and spirit.

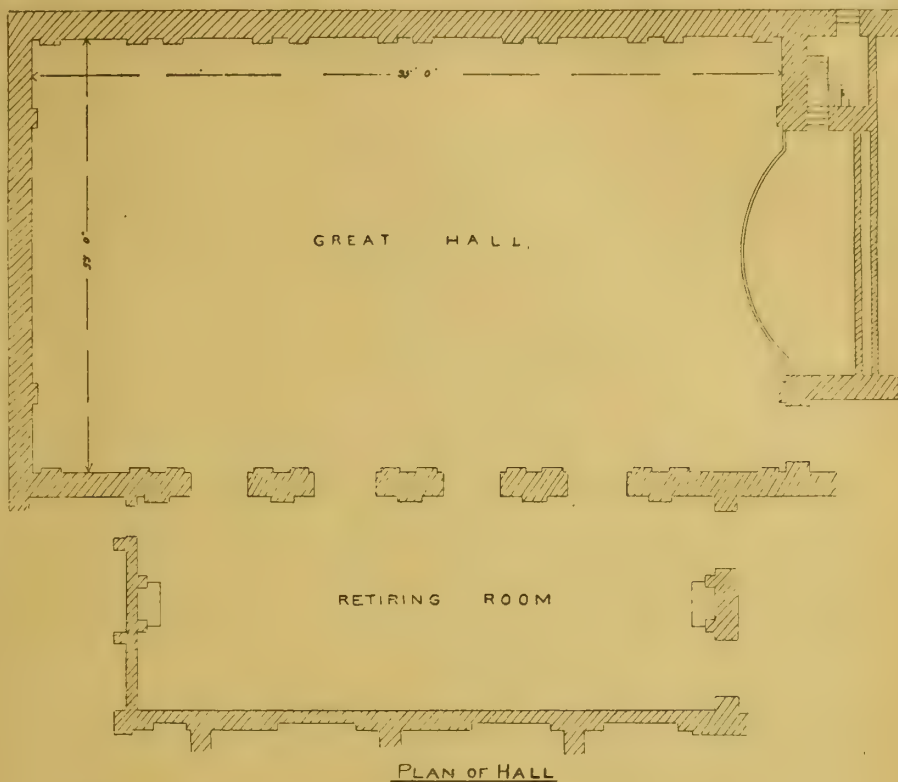
The demand for an assembly-room in large hotels springs from the fact that the number of persons assembled is so great that they seek for amusement on the premises. The facility afforded for banquets, dances, bazaars, &c., in a roomy hall attached to this large hotel are very great, as there is every accommodation given for the reception of guests, and for the taking up and putting down of the visitors arriving in their carriages from outside. These facilities cannot exist in halls situated in smaller premises, as the amount of space cannot be afforded for suites of rooms round the assembly hall, and there is not the same provision of space for outside traffic as there is in the case now before us.

It is well known that the Hotel Cecil in reality consists of three large blocks of buildings, the main block facing the Embankment, and two side blocks, inclosing a courtyard, with their ends abutting on to the Strand; or, rather, they will so abut when the houses now facing the Strand have been pulled down. The area already covered with buildings is about two-and-a-half acres, the courtyard is 300ft. long by 80ft. wide, and beneath this surface the three main blocks are connected as one large building.

The north end of the site at the Strand level is 35ft. above the Embankment level, and the concert-hall is situated in the eastern block, with its approaches and exits on this latter level.

The southern block, which is by far the loftiest, contains all the principal public rooms, the chief kitchen, and offices for the management, and the best suites of rooms. The western block, which is the smallest, has the smaller dining-rooms and bachelors' quarters. The eastern block, about the same area as the southern, has large family suites of rooms, arranged separately in pavilions, and has below the two great concert, or banqueting, halls, each with their own receiving, retiring, and smoking-rooms, which are so planned that they can be used together for any great function.

These rooms can be approached from the courtyard without passing through the hotel, and as they may be occupied by great numbers of people at a time, special exit arrangements have been provided by which the inmates can pass directly on to the low-level roads, and the Embankment without traversing any intervening staircases. Thus special exits are formed, which are on the level with the street, to be used in the event of any alarm. There will be a fourth block, the north block, which will be built after the acquisition of additional property, and will face the Strand.



Great difficulty arose in forming the foundations of this vast building, owing to sand and running water. In the case of the southern block trenches exist which are 35ft. deep and 16ft. wide, filled in with Portland cement concrete, and over the whole site of this block a bed of concrete is laid to a thickness of 6ft., while there is spread over the remainder of the site a layer of concrete 4ft. thick.

Naturally the accommodation of this building is most extensive, for it contains, roughly speaking, about one thousand rooms; but the concert-room is the largest room in the building, measuring 95ft. long by 55ft. wide, and it will accommodate as many as one thousand guests at a banquet. At one end is a gallery, or platform, with a separate entrance for the musicians, at the other is a small gallery for the accommodation of spectators who may wish to be the onlookers at either a ball or a dinner.

Although the plan accompanying this article does not show the entire surroundings of this hall, the smaller hall being omitted, it will be seen that there is a large retaining room on one side, in addition to which there are large lounges, &c., and every accommodation necessary in connection with concert halls and assembly rooms.

One of the special advantages in this hall for public assemblies of a fashionable kind where many of the guests arrive in carriages, is that the approach from the Embankment level to the concert-hall is by a special road running under the court, which road is entirely covered over. The carriageway is said to accommodate one hundred and fifty vehicles, all of which can be under the arches sheltered from wind and weather,

and remain there to be called at any minute. By this arrangement, ladies and gentlemen arriving at an assembly held at these rooms will be able to alight under cover, without in any way being exposed to the damp, mud, and night air of London.

The majority of the rooms in the southern block are reception-rooms, dining-rooms, and drawing-rooms, all public rooms, and guests occupying these rooms would enter the southern wing and descend by a wide staircase in the eastern wing to the Embankment level, and thus approach the concert-hall without traversing the courtyard; they could also reach the hall from the upper level by means of the hotel corridors and main concert-room entrance staircase.

The eastern and western blocks from the courtyard upward are occupied by private rooms, and by the usual rooms of a hotel, all of which are in addition to the large hall which forms the subject of this paper.

### CAST-IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XVIII.

By JOSEPH HORNER.

THE founder has invaded, and largely appropriated, the province of the smith, as well as those of the carpenter and mason. Formerly, railings, gates, grilles, ornamental hinges, panelings, lamp-brackets, and such like were constructed, piece by piece, of bar-iron, hammered, bent, twisted, punched, welded, and bonded together in more or less artistic fashion. Numbers of these antique specimens are preserved in the Wrought-Iron Gallery at South Kensington



Numbers exist *in situ* both in England and on the Continent. Our respect for the old smiths is heightened by a close study of their productions, knowing, as we do, that they had not even the advantages of beginning their work with bars ready rolled to the various sections required. Everything had to be hammered to sectional shapes first, from the rude bloom. To-day, notwithstanding that the manufacturing smiths have the advantages of bars and rods perfect in form and dimensions, and all the aids which stamps and power hammers afford, intricate forging is necessarily costly. Once got away from plain spike-head rails, into curved stems, flattened and veined leaves, and floral decorations, and the cost of labour becomes heavy. But in cast iron the cost of high ornamentation is, weight for weight, not very much greater than that of plain straight-line patterns. The reason is that, after the pattern is once made, the cost of moulding is simply a question of area, and not of detail. Such is not the case in smith's work, since in this the details occupy the time, and the only way in which this can be cheapened is by the use of stamps and division of tasks.

It is true that if we regard only the absolute fitness of things, it would seem that curves and floral designs should be more in harmony with the ductile and malleable than with the rigid cast iron. But it will not do to push such refined considerations to their limits. If we do, then why embody vegetable outlines at all in stone or iron? If the effect is pleasing, that is the essential canon of taste in these matters. And, more than that: none but an expert could possibly distinguish cast iron from wrought when painted or gilded. And by the use of cast iron a wealth of ornamentation is rendered possible, pleasing to the eyes of millions of the population whose lives are mostly passed in monotonous, dull, colourless, and tame surroundings. It popularises art for these, just as cheap classics popularise literature, both otherwise the exclusive possession of the favoured few.

The construction of gates was, until recent years, monopolised by the carpenter and smith. But the smith could rarely undertake any but the plainest forms, in which straight bars predominated. When elaborate gates involving foliated designs have been constructed, they are now carefully preserved as monuments of a marvellous skill. But the old designs are rivalled in the gates of cast iron, which are so readily made. Gates, like railings, lend themselves to infinite variety of forms in the hands of the founder—forms which would have been impossible of realisation in malleable iron or in stone. As in railings, the semblance of forging is preserved in many castings; but in others it is utterly departed from, and new styles peculiar to flowing metal are designed. There are many devices in cast railings which could not be carried out by the smith. It is easy also to obtain finer lines and surfaces in cast iron than is practicable in forged work, unless the question of cost is subordinated to that of excellence of results. Many of the deep sections which are cast could scarcely by any means be forged. The same remark applies to many mouldings and broad handrails. Only by processes of elaborate building up and riveting could these be done. So that in some respects many cast-iron railings embody a style peculiar to cast iron, and which could not be embodied in any other material, except in some cases in stone. In many, however, the tracery would be too delicate for realisation in stone. In some castings the outlines of designs in malleable iron are faithfully copied, as in vertical bars combined with horizontal, in binders or clasps for clamping stems together at their points of contact, and so on. But in many even these resemblances are dropped, and a glance is sufficient to show that only by casting could the forms be produced. Railings are cast in all heights, from those of dwarf dimensions up to 10ft. or 11ft., and in all designs. They are cast for panels, for trellis work and grilles, for balconies, screens, and palisades. These are not necessarily cast in one vertical plane, but the general outline is frequently curved inwards and outwards. Often, too, the sections are heavily moulded. In some cases the hand-rail is cast separately from the railing itself. Coping can be cast with sockets to receive the hand-railing. All railing is fixed in sockets or dovetails, which are variously secured to masonry, either being sunk into holes, or cast on plates with holes for spiking down.

The multiplication of gardens, parks, town bands, and popular institutions has favoured the increased employment of cast iron as a material of ornamental construction. Among many purposes to which it is adapted are band-stands, kiosks, refreshment-stalls, pavilions, colonnades, porticos, covered promenades, winter gardens, fencings, &c. These buildings are all constructed in many parts, embodying a profusion of ornament which could scarcely be obtained in any other material, certainly not at the same cost. With due protection, the iron is practically everlasting, even though exposed continually to the weather, as most of this kind of work is. By means of paint, enamel, and gilding any desired effect can be produced.

Drinking fountains and watering-troughs are suitable subjects for treatment in cast iron, and they are constructed in various dimensions and designs. They range from small fountains and troughs laid against walls, to those of large dimensions for busy thoroughfares, in which ornamentation as well as utility is the aim. Some of the canopied fountains vie with the best carved masonry in architectural effect. Many pillar fountains of the larger dimensions, being surmounted with an ornamental lamp, serve a double purpose both in respect of utility and pleasing effect.

There is a good deal of ironwork which is of a purely ornamental character, and by which the appearance of a plain building is altered to that of an architectural character at a relatively small cost. Much of this work is done with tiles of different shapes; but cast iron is a better material in many respects for some purposes, because lighter, and capable of taking more ornamentation. The ridge-plates and cresting, the curb-plates and hip-plates, with their shields and crockets, are cases in point. These can be made to suit any pitches of roofs, and in all styles of decoration to suit different models of architecture. In the case of ridge-plates, the cresting when added is cast distinct from the ridge-plates, and attached thereto either with sockets or dovetails. Angular pieces are cast to cover over the meeting angles. Terminals of every conceivable design are cast for corners, ranging from a height of 3in. to 20ft. Finials and bannerets, turret caps, and much beside are made in cast iron. Enrichments also take the form of beadings, scroll-work, friezes, panels, dwarf railings, paterae, monograms, devices, crests, &c. Even coronals and turrets for Gothic spires are made in cast iron, and also clock towers and belfries, as well as the cheaper class of statuary. Lastly, in the category of the application of cast iron to ornamental design, I may instance the register grates used in dwelling-houses. The castings are clean, smooth, and sharp, and their cost is low.

From the foregoing examples I think it must be conceded that cast iron is admirably adapted for a very wide range of ornamental and truly beautiful designs, and that its marvellous cheapness leaves it without a rival in many fields of service. The problem of its preservation from corrosion follows directly from a consideration of its uses, and we will consider this immediately.

(To be continued.)

#### SANITARY SPECIALITIES.

WE have received the new catalogue of sanitary specialities published by the well-known firm of Messrs. Adams and Co., engineers and sanitary specialists, of Old Queen-street, Westminster, and of York and Leeds, &c. The illustrations and price-list are quite up to date; the former have the great advantage of being reproduced from photographs of the goods themselves. Adams's patent "automatic trough flushing closet" is so well known to the profession that it is needless again to say anything of its merits. The illustration given of this arrangement and the "concentrating channel" for reducing the bulk of water in the trough shows the value of this trough closet for schools and workshops. The prices also appended for strong glazed ware and patent automatic flush tank are very moderate. The "patent automatic flushing latrine" made by the firm, with flushing ram, is also shown, with section. Then we have Adams's patent "Insular" multiple automatic closet, with vertical and horizontal flush-pipes, an excellent fitting for schools, each closet being complete in itself. In all these closets and latrines the objectionable woodwork casing is avoided. The "automatic siphonic multiple closet" is also illustrated,

which combines the best features of the former with siphon outlets, and is a pedestal closet of glazed brown earthenware. Other closets, such as the patent "Insular" automatic, the patent glazed ware slab closets (the "Epic") of several patterns, are illustrated. The latter are very cleanly and artistic, and are quite a new type—the whole closet is in one piece of ware. The designs for pedestal closets suitable for every requirement for mansion and cottage are too numerous to specify, and the photo. representations give an excellent idea of the ornamentation. The seat and pipe arrangements shown are also worth notice. Lavatory ranges of all descriptions, some in brackets, others on iron standards and on glazed ware piers, with longitudinal waste-pipe, are great improvements on the ordinary patterns. Then we have several pages devoted to lavatory basins, urinals, Adams's automatic siphon flush tanks, baths, sinks, flushing siphons (automatic), disconnecting chamber and channel slabs, gully traps, automatic flusher and latrine for slop water, well worth the attention of the architect and sanitary engineer and builder. Every article is described and illustrated, prices being appended to each page, so that there is no difficulty in hunting for any particular speciality. As an office-book of sanitary fittings embracing the most desirable features, Adams and Co.'s Catalogue is very complete.

#### NOTES FROM PARIS.

THE new buildings forming the studios, workshops, and depository destined to contain the complete and magnificent stage scenery of the Paris Opera-House, are being constructed on the very outskirts of the town, just under the fortifications of the Boulevard Berthier. The building will therefore be completely isolated, and at some distance from any neighbouring dwelling-houses. The building is protected on all sides by lofty iron railings, and comprises a convenient dwelling for the caretaker and watchmen; two wings, 130ft. by 75ft. and 65ft. high, will contain the reserve of scenery; an immense hall in the second place will serve as a workshop for the carpenters and fitters; a wide gallery over this hall will be used as *ateliers* for the tapestry workers and needle-women. On either side of this hall are the immense studios for the painters and decorators. Every precaution has been taken against the risk of fire—the chief danger in a depository containing such inflammable materials. The architect is M. Charles Garnier, the architect of the Paris Opera-House. The building will cost £25,000. At a certain distance from this building a second, very similar to the first as regards the arrangement of plan, is being constructed from the designs of M. Bernier, architect of the new Opera Comique now being raised on the Boulevard des Italiens, and is destined to contain the scenery of that theatre. In this latter depository all the separations and partitions are being constructed entirely of iron, whilst those in the depository of the Grand Opera are constructed chiefly of wood. Probably both architects have their reasons for their preference to iron or wood; but at first sight it would appear that the iron partitions would afford greater security against fire.

A society has been formed with the intention of constructing an immense hippodrome in the now almost-deserted gardens of the Palais-Royal. The quarter of the Palais-Royal and the gardens surrounded by the block of buildings not so very long ago the centre of Parisian life and gaiety, are now becoming quite abandoned by pleasure-seekers, who find other quarters of the town more attractive and gay. The tradesmen and inhabitants of this quarter have earnestly taken up the matter in their own interest, and have formed a syndicate headed by M. Roujon, director of Fine Arts, and composed of several well-known architects and members of parliament, for the purpose of constructing in the centre of the gardens a hippodrome to contain about ten thousand seats, and covering about a quarter of the total surface of the gardens. As it is imperative that the crest of the building should not surpass the height of the surrounding palace, it will be necessary to place the upper galleries on a level with the ground, and excavate the ring to a depth of from 25ft. to 30ft. The stables will be underground, and their entrance will be made at some distance away on the lower embankment of the Seine, the communication with the stables being provided by an underground tunnel already



existing, and which, it appears, united the river banks with the stables of a circus which existed in the gardens of the Palais Royal at the beginning of the century.

Considerable modifications and improvements will shortly be commenced to the buildings of the *Chambre des Deputes* at the Palais Bourbon. The principal of these consists in the construction of a new parliament hall of an elliptical form, with tiers of seats converging towards the speaker's table, and capable of holding from 600 to 700 members' places. The acoustics of this hall will be very carefully studied. In the day time the hall will be lighted through decorated glazed panels placed between the mouldings of the arched ceiling, and in the night time by means of electric lighting to the power of 30,000 candles. The estimated cost of this work is about £120,000.

French architecture has experienced a heavy loss in the person of Mr. Gaspard André, whose death occurred at Cannes on the 12th inst. M. André, one of the most brilliant of the architects of the Lyons School, was born at Lyons in 1840. His studies at the *Ecole des Beaux Arts* of Paris as pupil of the atelier Quetel were marked with the greatest success, to be followed later on by other successes in public competitions, in the participation of which this architect was always to the front. He took an active interest in the study of the most serious questions regarding the interest of his profession, and was one of the foremost in the organisation of provincial schools of architecture, public competitions, and the defence of the rights and dignity of architects. He was at his death president of the Lyons Academic Society of Architecture, the Architectural Union of Lyons, and the Lyons Committee of Fine Arts, and was also Chevalier of the Legion d'Honneur. Amongst some of the best known of the works which he leaves to posterity are the *Theatre des Celestins* at Lyons, the elegant *Fontaine des Jacobins* in the same town, and a remarkable work of the highest sentiment, but possibly the most criticised, the Protestant Church of the *Guillotiere*. The theatre of Geneva and the new university at Lausanne will shortly be commenced from the designs left by the regretted architect.

The English cottage style of Queen Anne is fast becoming *à la mode* in France, and is much appreciated by those who, a few years ago, found nothing better to their taste or to the fashion than the "Norman House," of which so many examples are seen at the French watering-places. The demand being for English cottages, the want must be supplied; but here our French brethren of the architectural profession find a certain difficulty in providing the article according to the required style. The temperament of the designer, his rules of composition, and his academical education will not allow him to produce, however hard he may try, the small, unsymmetrical, picturesque building here styled "cottage anglais," and of which so many really good examples may be seen in all the country districts surrounding London. The English cottage, although derived from the Anglo-Norman country dwelling of the Middle Ages, is now strictly English, both as regards the sentiment of the design and the arrangement of plan, and if transplanted into France at the desire of the followers of a temporary idle fashion, will always appear out of place and out of harmony with the style of the landscape itself, the necessities of plan, and the Classical taste of the country. The modern English suburban dwelling is, as regards its mass and silhouette, apart from the idea of the half-timber or other decoration, more or less copied from early styles, the natural outcome of the plan arranged in the first place with careful attention to the proper position of each room with regard to its destination and use, and afterwards studied ingeniously and with artistic sentiment with regard to the fullest picturesque effect which may be obtained in the elevations from such a plan, but with perfect disregard to any idea of classical symmetry, either in plan or elevation, as long as the sense of proportion and harmony is satisfied.

In France during later years, it is true, numerous examples of a somewhat similar style of suburban and country dwelling have been raised, and often of considerable picturesque effect and good taste in design; but still, in nearly all of these it is easy to observe that the sentiment and feeling of Classical tradition and symmetry are still there, despite the endeavours to put them aside. The French architect during his early studies at the studio of the *Ecole des Beaux-Arts* was taught to follow the rules and traditions

of Classic art, and these most strictly, as a foundation for his architectural training. He was taught to compose in a systematic manner, and as the methods of his style require with great attention to symmetry, he was at the commencement of his course of training given subjects for composition and design, such as a small town hall, a small museum or library placed in the centre of a park, and other buildings of a like style, with, as a rule, unlimited space and money for building purposes. His façades for these buildings were to be in good Classic style, in order to show his studies in the composition and proportion of the Orders. His plans were also necessarily arranged in an almost perfectly symmetrical fashion, and often various portions of the plan were sacrificed for this reason. The plan should look well on paper, and the *points de poché* carefully observed. Later on the programmes of the school competitions assume a more imposing form, and here the monumental façade and Classic plan carefully arranged to obtain as much symmetry as possible, on account of the necessities of the façade, and for the effect of the plan on paper, is imperative. This sentiment of Classic form and design, inborn in the first place, and increased by the teaching of the school, will not permit the future architect to cast it even for a time aside, his elevations for buildings of small importance, and very often his plans for the same, seem to strive after a monumental character, or, at least, employ the elements of monumental design. Of course, he is perfectly aware that in the case of villas, cottages, and small dwelling-houses, such a style and method of design would verge on the absurd; but he finds it not easy to follow other methods, and will very often fail in the case of a small building to produce a pleasing design, when if the work had been an important one, he would possibly have produced a chef-d'œuvre. The English cottage or anything nearing it, desired by the followers of to-day's fashion for their suburban houses, can be produced only by English architects.

Much ado is being made regarding the manner of the partial restoration and repairs lately done to the Cathedral of Soissons. It is said that, contrary to the principles advocated by Viollet-le-Duc and to Government instructions, the work of cleaning the walls, mouldings, and decorations of this cathedral has been done with coarse-toothed rasps and iron-wire brushes, and that this chef-d'œuvre, the Cathedral of Soissons, one of the purest examples of 13th-century style, has been entirely spoilt. ARTHUR VIE PARMINTER.

#### LORD LEIGHTON MEMORIAL, SOUTH LONDON ART GALLERIES.

AT last week's meeting of the Camberwell Vestry, the scheme previously agreed to by the Libraries Commissioners for erecting a new Technical Art Institute and façade to the South London Art Galleries in Peckham-road, was carried by acclamation, Mr. J. Passmore Edwards having rendered its execution possible at the present time by undertaking to furnish £5,000 for the purpose; and it was also agreed unanimously to adopt the proposal made by the chairman of the Vestry, that Mr. Edwards's name shall be distinctively associated with the Institution. The building thus to be erected at the instance of the Commissioners for Public Libraries and Museums for Camberwell, is to be from plans incorporating these arrangements, and which were exhibited for the inspection of the vestry after they had been submitted, together with Mr. Edwards's munificent offer, to the Commissioners, made in response to an appeal to Mr. Edwards by Mr. Edward Foskett, F.R.S.L., the chief librarian, and on whose report the vote of the vestry was passed. In consequence of the vestry's vote Mr. Edwards has, on the above understanding, confirmed his offer, which supplements a previous gift of £3,000 expended a few years since on the erection of one of the two existing picture-galleries to the rear. The new Technical Institute will comprise studios for modelling and decorative design, drawing from the life and applied ornament. In the basement workshops for metalworkers and enamellers are provided. A side subway is contrived to reach the rear premises and for transit of objects for exhibition, &c. Retiring-rooms for the students, masters, and an office for the curator are provided. A feature is made of the gallery in the modelling studio. The main portal leading to the art galleries is to be in polished granite. The conduct of

the school will be under the auspices of the Education Board of the London County Council; and Messrs. Geo. Frampton, A.R.A. and Mr. W. R. Lethaby are named as the directors appointed by the County Council. Mr. Maurice B. Adams, F.R.I.B.A., is the architect. The late Lord Leighton, P.R.A., was the first President of the South London Art Galleries, and it is intended that this building shall be dedicated to his memory, the inscription to be placed on the keystone of the entrance archway.

#### THE "NEW PHOTOGRAPHY."

EVERYONE has not yet seen an example of the "new photography," and we therefore avail ourselves of the opportunity which has been afforded us of presenting to our readers what we believe to be the result of the very first attempt to usefully apply the wonders of the Röntgen rays in connection with matters architectural. The photograph, which is the work of Messrs. G. Houghton and Sons, of High Holborn, illustrates an iron pulley wheel mounted upon a



purpose-made wood frame, which was made to take the place of the ordinary metal one in order to show the wheel. It is curious to note the presence of the French nails used for the purpose of securing the "frame" to the "face-plate." The whole was imbedded in solid wood pulley stile at a distance of more than 1½ in. from the face of the wood exposed to the "X" rays. It will be seen that, notwithstanding the extra ½ in. which the rays had to penetrate (where the beads are), no difference of density in tone is made upon the surface of the wheel. What an enormous field for the useful application of this new discovery is opened up for investigation! The N.A.P. Window Co. have lent us the photograph, and as the originals are much larger than our space could accommodate, we recommend our readers to apply for full-size prints at their show-rooms, 159, Victoria-street, Westminster, S.W.

#### MESSRS. PAWSONS AND LEAF'S NEW PREMISES.

ON Saturday afternoon the members of the Building Construction Classes at Regent-street Polytechnic united with the similar classes at Grosvenor House, Walthamstow, and at the Kilburn Polytechnic, in a joint visit of inspection to the new premises of Messrs. Pawsons and Leafs, Limited, St. Paul's Churchyard, by invitation of Mr. Herbert Ford, the architect. The visitors, who numbered over 200, and were under the leadership of Mr. Robert Mitchell, the director of education of the Polytechnic, and his brother, Mr. Charles Mitchell, the teacher of Building Construction at that institution, were received by Mr. John Cropley, clerk of works, Mr. H. L. Ford, son of the architect, and Mr. James Peters, contractors' foreman, who described the works and conducted the party over the premises. The new buildings cover an extensive area, extending in depth from St. Paul's Churchyard to Carter-lane, and from Godman-street to Dean's-court (which has been widened



to 22ft. and opened out for vehicular traffic), and have frontages to all four thoroughfares. They replace a range of mediocre and pretentious compo-fronted warehouses, and are faced with brown Portland stone from the Weston quarries, supplied by the London Steam Stone Sawing Co. The style adopted by the architect, Mr. Herbert Ford, may be described as a City type of Free Renaissance. The carving is being executed by Mr. Gilbert Seale, of George-street, Camberwell. The building is, in the centre, nine floors in height, the street level, three floors above basement, and sub-basement being arranged as warehouses, stock-rooms, offices, &c., and the three upper floors as dormitories, dining and sitting-rooms for the assistants. The work is being carried out at a cost of about £100,000 by Messrs. Patman and Fotheringham, of Theobald's-road, W.C., in one contract, but in two sections. Of these, the first or western block, has been completed and is occupied, and the central portion is being roofed-in; but the eastern part, next Godliman-street, is delayed while a new sewer is being laid by the City Commissioners. A prominent feature of the building operations is the immense steam crane carried on substantial staging rising above the roof level; it was supplied by Messrs. Butters, of Glasgow, and is the largest in the Metropolis, the derrick having a 56ft. radius, with a jib 72ft. long. The constructional ironwork is by Messrs. Richard Moreland and Co.; the fireproof staircases and paving are supplied by Messrs. W. B. Williamson and Co., of Newcastle-on-Tyne and Westminster. The fibrous plaster decorations are being carried out by the Veronese Co., Limited. Messrs. Hayward Brothers and Eckstein, Union-street, S.E., are fitting up the prismatic pavement lights, and Mr. George Jennings, of Lambeth, is fitting up the sanitary appliances, while Messrs. Robert Boyle and Son's automatic ventilators are adopted. The areas are lined with white glazed brickwork, supplied by Messrs. Ingham. There will be nine lifts, all supplied and fixed by Messrs. Easton and Anderson. After a thorough inspection of the building, beginning at the sub-basement, the visitors eventually assembled on the platform of the crane, 120ft. above the churchyard level, where they were photographed, and then returned to the ground floor, where a hearty vote of thanks was accorded to the proprietors and to the architect, clerk of works, and foreman, on the motion of Mr. C. Mitchell, seconded by Mr. T. Hobart Pritchard, also of the Polytechnic staff. The motion was acknowledged by Mr. Godfrey, secretary to Messrs. Pawsons and Leafs, Messrs. H. L. Ford, Cropley, and Peters.—Mr. Cropley, in a shrewd and humorous address, urging the students, while seeking to gain all the technical and theoretical knowledge they could, not to ignore the practical side of their work, and above all not to forget that the ability to produce a neat drawing, or take certificates from South Kensington or elsewhere did not necessarily make them practical men, able to cope with any difficulty or emergency that might arise, either as architects or workers on a building.

The Building Construction Classes at the Regent-street Polytechnic number some 450 students, of whom over 350 have made the twenty attendances entitling them to sit for the South Kensington examinations. The classes have been, for the past ten years, under the tuition of Mr. C. Mitchell, who succeeded the late Mr. Robert Harland, in whose time there were about a hundred on the rolls. During the recent winter and spring, the Regent-street classes have paid Saturday afternoon visits to the Royal Architectural Museum, where they were received by Mr. John P. Seddon, F.R.I.B.A., who showed the unique collection of mediæval architectural casts at that institution; the Prudential Assurance Offices extension, Holborn, where the architect, Mr. Alfred Waterhouse, R.A., the president of the classes, acted as guide; the Sanitary Institute, Margaret-street, W., where they were met by Mr. Knight, the curator; the new Birkbeck Bank, where the architect, Mr. T. E. Knightley, received them, and Messrs. Gilbey's immense five-story block of concrete buildings at Camden Town.

#### THE INSTITUTE OF BUILDERS' CLERKS OF GREAT BRITAIN.

THE inaugural meeting was held at St. James's Hall on Saturday last. The chairman, Mr. J. A. Ham, explained the objects of the institute,

and announced that, in consequence of another institution registering a similar name, it was necessary to adopt a fresh title, as above. After an animated discussion it was agreed to register the rules under the Friendly Societies Act, and several additions were then made to the provisional executive. It was agreed that another public meeting should be called as soon as the registration is completed. The meeting, which was most enthusiastic, dispersed after the customary vote of thanks.

#### CHIPS.

The Atcham Rural District Council, Salop, have elected as their surveyor, from among 52 candidates, Mr. John Morris, who has for the past 17 years been surveyor to the Neston and Parkgate Local Board.

A new Primitive Methodist chapel in High-street, Bloxwich, was opened last week. The building is from designs by the late Mr. S. Loxton, of Walsall, carried out by his successor, Mr. J. H. Hickton, and, including land, organ, architect's fees, and all other expenses, the total outlay will be about £2,700. The contractor and builder was Mr. W. Hopkins, Birmingham.

The Metropolitan Asylums Board decided, on Saturday, to adopt plans for adding an isolation block to the Northern Hospital at a cost of £3,200, and for an extension of the female staff block and the extension of the laundry at Darenth Asylum, at an estimated cost of £1,330. They also accepted the tender of Mr. Thomas Adams, of Wood Green, at £7,800, for the formation of roads at Brook House Hospital.

Messrs. J. Jarvis and Sons, of Hackney-road, have this week been appointed the builders of the Passmore Edwards Public Library in Kingsland-road, Shoreditch. Mr. Maurice B. Adams is the architect.

The premises of Mr. Lonsdale, decorator, Keighley, were burnt out on Friday night. Damage to the extent of £4,000 was done, including a thousand pounds' worth of pictures.

Mr. J. H. Rider, of Bristol, has obtained the appointment of electrical engineer to the Plymouth Corporation at a salary of £300 a year, the selection having been made from 40 applications.

The £100 premium offered by the Marlborough Town Council for the drainage scheme most suitable for the requirements of the borough has been awarded to Mr. G. Maxwell Lawford, Assoc. M.Inst.C.E., Westminster, and his scheme has been selected for immediate adoption.

The Kesteven County Council have, by 28 votes to 15, decided in favour of a site at Raunceby, near Sleaford, for the erection of a new asylum, at an estimated cost of £50,000.

The Manchester Art Gallery Committee purpose holding an exhibition of architectural drawings during the spring and summer months.

The annual meeting of the Hampshire Field Club was held at Winchester yesterday (Thursday), when Mr. J. B. Colson, F.R.I.B.A., of Winchester, architect to the Dean and Chapter, acted as guide during the visits to the buildings of note. Facilities were given by the Dean for the inspection of the ancient timber roof of the Cathedral nave. This roof is of Norman date, and some restoration or repair of it will shortly be undertaken.

During some excavations for building purposes in Priory Fields, Taunton, a portion of the remains of the old Priory has been discovered, together with about a dozen human skeletons, supposed to be those of soldiers killed during the Parliamentary war. They were only about 2ft. below the surface of the ground.

On Saturday a new entrance from Arlington-road, Brixton, at the northern end of Brockwell Park, was opened. For the new approach the London County Council were enabled to acquire a long strip covering an area of 3 acres 2 roods and 28 poles for £6,000. Upon this plot has been laid out, from the plans of Lieut.-Col. Sexby, the chief of the Parks Department, a footpath leading into the park, and an ornamental garden and shrubbery. The cost of the laying-out has been about £1,800.

A handsome brass eagle lectern has just been presented to Christ Church, Ebbw Vale, by a parishioner, in memory of her parents. The work was intrusted to Messrs. Jones and Willis, of Birmingham, London, and Liverpool.

At the meeting of the St. Paul's Ecclesiological Society, held at the Chapter House, E.C., last (Thursday) evening, an illustrated lecture was given by the Rev. Walter Marshall, entitled "Photographic Notes on Some Norfolk Churches."

The Brook-street Board Schools, Carlisle, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

#### OBITUARY.

By the death of Mr. EDWARD ASHWORTH, at the age of 81 years, Devonshire, and, indeed, the West of England generally, loses its senior architect. His father belonged to a Durham family, and was a barrister, but eventually became a farmer at Colleton Barton, near Chulmleigh, North Devon. The deceased was first articled to Mr. Robert Cornish, then the Cathedral architect and surveyor, of Exeter, but afterwards became a pupil of Mr. Charles Fowler, of Gordon-square, London. After passing some time in other London offices, Mr. Edward Ashworth sailed, in 1842, for New Zealand, which was then in an undeveloped state. He took out sashes and frames from England, and built his house with his own hands. But the country did not afford a brilliant prospect from a professional point of view, and, after visiting Australia, Hongkong (where he was employed in carrying out works), and Canton, he returned to his native land in 1846, having been absent about four years, much improved in health. He then started practice, at a time when the late Mr. John Hayward (who died at the venerable age of 83 years in 1891) was the only other architect in the city, which then had a population of 40,000. To-day, with a population returned at the last census as 10,000 more, the current Exeter Directory gives (besides the name of the deceased) 21 other gentlemen in practice in the profession. Mr. Ashworth soon became widely esteemed as an ecclesiastical architect. He never actually retired, but failing health two or three years ago compelled him to refuse business. He designed the churches at Withycombe Raleigh (near Exmouth), Topsham, St. Mary Major (Exeter), Cove (Tiverton), Bicton, and Whipton; St. Sidwell's (Exeter); Exeter cemetery chapels and lodge; and was responsible for restoration and other works at the following churches:—Dulverton, Tiverton, Bideford, Lymington, Romansleigh, East Anstey, Seaton, Axminster, Shute, Wooton Courtney, Selworthy, Cheddon Fitzpaine (Somerset), Shobrooke, St. Sidwell's (Exeter), Cullompton, Chevithorne, Stoodleigh, St. Michael's (Honiton), Rewe, Brixham, Townstall (Dartmouth), Broadclyst, Goodleigh, High-bray, Holy Trinity (Exeter), Northmolton, Ugborough, and Bishopslynton. He was also engaged in many other instances. Mr. Ashworth was regarded as an authority on church architecture and restoration, and his opinion was very highly valued. He wrote and illustrated by a series of most interesting water-colours, for the Architectural Publication Society (1851), an essay on Chinese architecture. He was also the author of numerous papers, extending over a period of 30 years, on church architecture which were read before the Exeter Diocesan Architectural Society. Of the latter organisation he was curator, and was mainly instrumental in its reconstitution a few years ago. The society published a large number of measured drawings from his pencil. He was one of the oldest members of the Devon and Exeter Institution, of which he was a proprietor. Mr. Ashworth possessed a hardy constitution and almost evergreen activity. About three years ago, however, he commenced to fail, and towards the close of last year took to his bed for what proved to be the final illness. He was assiduously cared for, but passed away at his residence, 17, Dix's-field, Exeter, on the 8th inst., aged 81. He leaves a widow, two sons, and two daughters, all grown up. One son is an architect in London, the other a railway engineer. The funeral took place on the 12th inst. The body was first taken to St. Sidwell's Church, which—save the western tower and nave arcades—he had practically rebuilt, and in whose parish he had resided nearly fifty years. After a short service the burial took place at the cemetery.

There will be a mass meeting of plumbers held on Wednesday, March 25, at 7.30 p.m. in the Town Hall, High-street, Kensington, London, to discuss the merits and demerits of the Registration Bill for Plumbers, &c. For further particulars see advertisement, or address Mr. P. J. Davies, 78, Earl's Court-road, Kensington, W.

On Saturday the Laing Memorial Hall and Free Library, gifted by the late Alexander Laing, LL.D., Newburgh, to his native town, was formally opened, in the presence of a large assembly, by Sheriff Campbell Smith, Dundee. The building, which is situated in the High-street, consists of three floors, including a large circulating library, amongst which are the late Dr. Laing's books (which were also gifted to the inhabitants), a museum of science and art, a reading-room, and billiard-room.



## CONTENTS.

Procrastination Street	407
Professional Cramming	408
Building-Act Cases	409
The Society of Architects	409
Royal Institute of British Architects	411
Notes on Domestic Drainage—VII.	412
County Lunatic Asylums.—XII.	413
The Surveyors' Institution	414
Concert-Halls and Assembly-Rooms.—XIII.	415
Cast-Iron in Builder's and Contractor's Work.—XVIII.	415
Sanitary Specialities	416
Notes from Paris	416
Lord Leighton Memorial, South London Art Galleries	417
The "New Photography"	417
Messrs. Pawsons and Leafs' New Premises	417
The Institute of Builders' Clerks of Great Britain	418
Obituary	418
The Building News Directory	418
Our Illustrations	419
Building Intelligence	438
Architectural and Archeological Societies	438
Competitions	439
Correspondence	439
Intercommunication	440
Legal	440
Legal Intelligence	440
Water Supply and Sanitary Matters	441
Parliamentary Notes	441
Our Office Table	442
Meetings for the Ensuing Week	442
Trade News	443
Tenders	443

## ILLUSTRATIONS.

"WILHELM VAN HEYTHUYSEN," BY FRANS HALS.—NEW ADMINISTRATIVE RAILWAY OFFICES AT BOMBAY.—CONGREGATIONAL CHURCH, SWANAGE.—OWEN JONES TRAVELLING STUDENTSHIP PRIZE DRAWINGS.—"GLENROY," FINCHLEY.—CURIOUS NORWEGIAN FURNITURE.—TWO SUGGESTIVE STAIRCASES IN WOOD.—RESIDENCE AT COLWYN BAY.

## Our Illustrations.

"OLD MASTERS" ON THE CONTINENT: NO. XXXI.—PORTRAIT OF WILLIAM VAN HEYTHUYSEN.

THIS picture is in the Royal Gallery at Brussels, and it represents the Founder of the Haarlem. The painting is the work of Frans Hals, the ever-eccentric and always gifted pupil of Karel van Mander, the eminent painter and art historian. Hals was born at Antwerp in 1580 or 1581; but his parents were natives really of Haarlem. He led an improvident life, and was also twice married, leaving his widow a charge upon the poor-rate. He died in 1666, and for some time before his death had himself been maintained by the communal magistracy. Frans Hals was, however, an unsurpassed master in the art of portraiture, and amid the host of distinguished painters in that branch of art who practised in the Netherlands during the first half of the 17th century, he stands foremost—Rembrandt only excepted. Burton, in his notes to the Official Catalogue of the Foreign Schools represented at the National Gallery, points out that although Franz Hals' portraits have not the gravity and intensity of Rembrandt's, yet they cannot be termed superficial. His nature was hilarious, viewing life from the lusty and joyous side, portraying his countrymen with a keen sense for their idiosyncrasies, and a sharp but sympathetic sense of humour. His style is rapid and vigorous, distinguished by a freedom and lightness of handling which reproduces the impressions of vitality and movement. This feeling is strikingly brought out in the grand series of burgher guards' portrait groups exhibited in the Haarlem Museum, wherein the officers are shown assembled to celebrate some anniversary. The painter is seen, also, at his very best in his grand work dated 1633, representing the officers of the corps of St. Adrian gathered round their stout old colonel, Jan Claesz Loo, who is seated in their midst. The grouping here is perfect; the colouring in freshness, harmony, and force rises to the highest point; the sense of life in the heads is astonishing, and no less striking is their individuality. Works by this truly great painter are found in the public and private collections of Holland, Belgium, Germany, Austria, Russia, France, and England. We possess two in our great national collection in Trafalgar-square—the one a portrait of a woman, and the other a portrait of a man. The example which we give to-day is a typical work from his hand, distinguished by the same dashing treatment already referred to by Barton and by Bredius in his Amsterdam catalogue. The history of the Hals family is furnished and added to considerably by W. Bode in his "Studien zur

Geschichte der Holländischen Malerei," published in Brunswick in 1883. Our illustration is produced from a fine photograph taken from the original painting by Mr. Hanfstaengl.

## THE NEW BOMBAY, BARODA, AND CENTRAL INDIA RAILWAY ADMINISTRATIVE OFFICES, BOMBAY.

THIS building, which was commenced in April, 1894, is situated at the south end of the Marine Lines and Queen's-roads, Bombay, and will form an imposing terminal at the junction of these roads. The design is in architectural keeping with the surrounding public buildings—a condition laid down by the Government of Bombay. The site of the new building being in close proximity to the sea, much difficulty was experienced with the foundations; but this was finally overcome, and rock was found at depths varying from 16ft. to 24ft. The building will be faced with coursed blue basalt stone, and the domes, mouldings, capitals, columns, cornices, and carved enrichments will be in white Porebunder stone. The length of the west façade will be 300ft., and the height of the central tower will be 180ft. from ground-level. The latter will form a good landmark from the sea, and will be seen from all parts of the esplanade. The tower will be square from the base up to 100ft. in height, when it will take the form of an octagon up to the springing of dome, which will be circular. The central gable will be crowned by a group of figurative sculpture representing "Engineering." Two carved heads in full relief of the Colonels French and Kennedy (the pioneers of the Railway Company) will be placed in the circular panels between the arches of the central carriage porch. The building will consist of three floors for office purposes, but in the centre there will be an extra floor for records. On the ground-floor accommodation will be provided for the traffic, police, medical, and cashiers' departments, with lavatories for European and native employes attached. Latrines will also be provided, detached from the main building, but connected by an open corridor. On the first floor, accommodation will be provided for the agent's and engineering departments, and also a spacious board-room in the centre of the building. The second floor will be occupied by the accounts and audit departments, and the Government examiner of accounts. There will also be a library and officers' tiffin-room on this floor. Both the first and second floors will have lavatories and latrines provided, as on the ground floor. The ground both front and back will be laid out as a garden, and will be divided from the public roads by ornamental railings and gates. The cost of the building, including drainage and water supply, will be seven lakhs of rupees. The architect is Mr. F. W. Stevens, C.I.E., F.R.I.B.A., &c., who has also designed and carried out many of the largest modern architectural works in India. Rao Sahib Siteram Khandarov, M.S.A., is the resident engineer in charge of the work under Mr. Stevens.

## CONGREGATIONAL CHURCH, SWANAGE, DORSET.

THE old chapel, an exceedingly plain building, is to be converted into Sunday-school rooms, the large room now being used for that purpose being used as class-rooms, and the front brought into harmony with the new building so far as it possible to do so. The new church will be built entirely with the local Purbeck stone, the dressing being worked fair, and will contain accommodation for 550 worshippers (310 being on the main floor and 240 in the galleries). The organ-loft is placed in the gallery behind the pulpit with separate and stairs. The interior being finished with open-timbered, wide-span roof, with curved ribs to the principal. Mr. T. Stevens, of Bournemouth, is the architect.

## OWEN JONES TRAVELLING STUDENTSHIP PRIZE DRAWINGS.

*Ringers' Gallery, Trunch Parish Church.*—This is all that remains of the ringers' gallery. It is a fine specimen of the bold and effective decoration characteristic of the 15th century in East Anglia. It is situated under the western tower, and access is gained by a staircase in the corner, while a convenient dressing or waiting-room for the ringers is formed below. There were probably a series of painted panels forming a parapet which have disappeared.—*Castle Acre Church: Remains of Roof Screen.* Like so many of our finest English roof screens, this has been cut down to the level of the lower panels; but in this case what remains is probably the best of it. The mouldings and tracery point to rather a late date, probably 16th

century, when Gothic woodwork became so very debased and coarse; but the figures are painted with the greatest care and delicacy, and may be the work of a Flemish artist. It will be noticed that the figure of Christ occurs on the right-hand side, which is unusual.—*St. Alban's Abbey: Roof of Nave.* The eastern part of the nave roof has fortunately survived the "improvements" at St. Alban's, and is one of the finest specimens of English decoration. It is divided into panels about 4ft. 6in. square, every alternate one having the motto "I.H.S." in a wreath. In the other panels are angels bearing shields supposed to represent all the ruling houses of Europe, that of the Pope occurring many times; also the emblems of the Passion. Intertwined with a wreath round each angel is a scroll with the "Gloria in Excelsis" and "Te Deum" repeated all over the roof. These drawings form part of a collection of English colour decoration made chiefly in East Anglia in 1894.—J. J. JOASS.

## "GLENROY," FINCHLEY.

THIS house, the garden view of which we are now illustrating, was erected in 1892 at Church End. Externally the materials used are red bricks of a light colour, rough-cast plastering for the first floor, and gables, with some half-timber work, and Broseley tiles for the roof. The whole of the woodwork is finished cream white. The work was carried out by Mr. F. Voller, of Wood Green, from designs and under the superintendence of Mr. E. W. Poley, A.R.I.B.A., of Effingham House, Arundel-street, Strand, W.C.

## NORWEGIAN FURNITURE.

THE two curious pieces of modern Scandanavian workmanship which we herewith illustrate were purchased in Norway by a gentleman now deceased, and hence found their way into the sale-rooms of Messrs. Christie, Manson, and Woods. The oblong table terminates at either end in the head of a monster, which stands boldly out, like the prow of an old Viking ship. The stretcher has a strange-looking demon at the crossing. The armchair is still more barbaric in style, the back being ornamented with a grinning mask recalling some African idol, while two coiled monsters form the arms. Both pieces are made in light oak, partly painted and gilt.

## TWO STAIRCASES.

IN the accompanying illustrations, the sketch to the left shows the staircase in the University Clubhouse, Philadelphia, of which Mr. Wilson Eyre, jun., is the architect. The disc-like terminals of the newel-posts, and the close wattled sides in place of balusters, are novel features which give an unusual character to the whole. We illustrated a fireplace at the same Club in our issue of Feb. 14th last. In the right-hand sketch is shown the staircase of a residence at Chicago, Messrs. Beers, Clay, and Dutton being the architects. The design in this case follows more closely the lines of the old Colonial work.

## RESIDENCE AT COLWYN BAY.

THIS residence, which is just finished, is situated on the hill-side at the corner of Oak Drive and Pwllcrochan Avenue. The work has been carried out by Mr. J. Berth Jones, of Colwyn Bay; plumbing by Mr. Charles Taylor, of Eccles; and casements, ornamental glazing, and gas-fittings by Messrs. E. Farrar and Co., 69, Berners-street, W. The architect was Mr. L. Barlow, A.R.I.B.A., of Manchester.

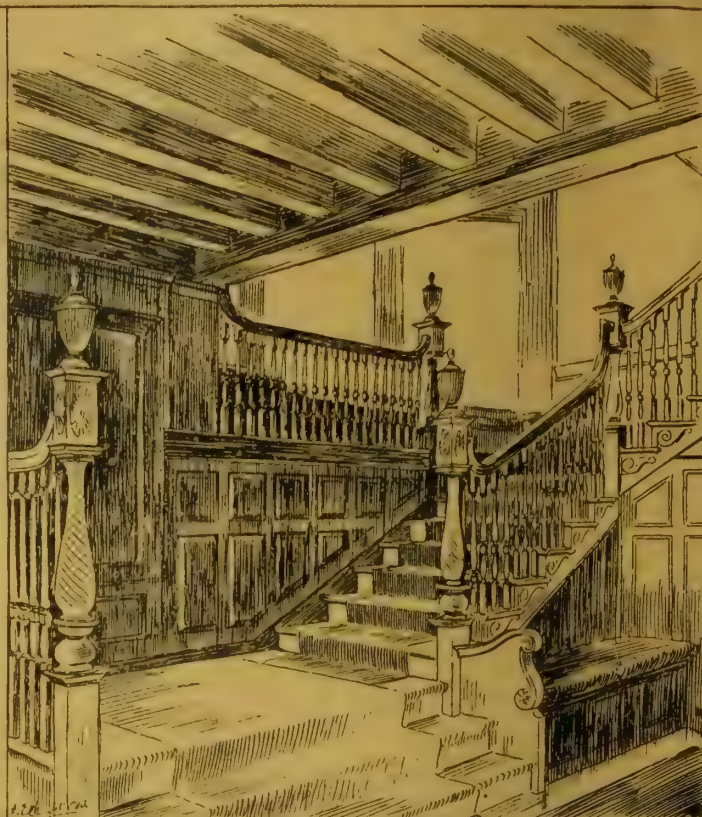
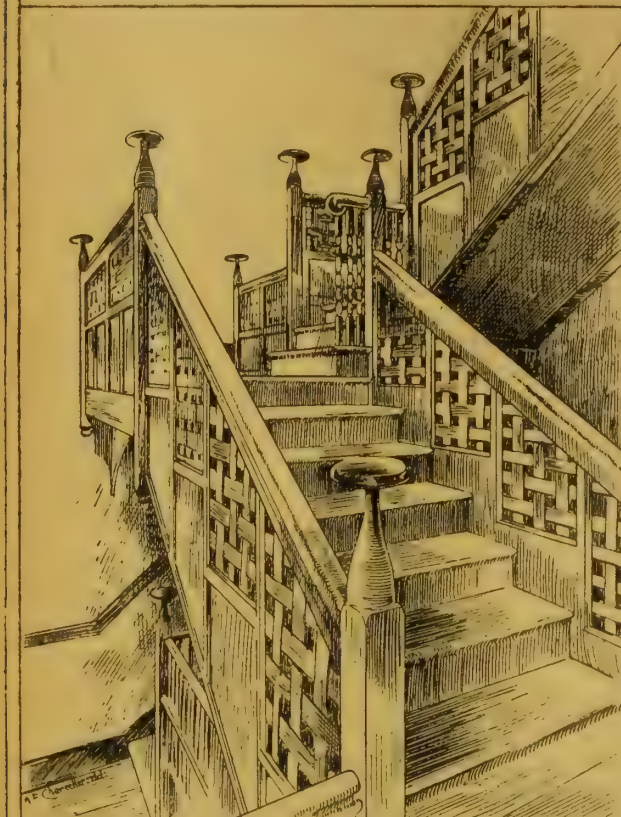
The new extension of railway between the Birkenhead Docks and Connah's Quay was opened for goods traffic on Monday. It has been constructed for the Manchester, Sheffield, and Lincolnshire Railway Company.

The French Chamber, by large majorities, rejected on Monday the motions proposed with the view of limiting or modifying the Government scheme for the holding of an International Exhibition in Paris in the year 1900. The Government Bill was considered in detail, and its clauses were agreed to.

The N.E.R. Company are about to carry out important extensions in their waggon-building operations at New Shildon. The contracts for the work have now been let. It is estimated that the cost of the extension scheme in its entirety, inclusive of purchase of land and machinery, will reach over £80,000. The extensions will cover a space of 130,924 yards. The extended works at New Shildon will employ 500 additional hands. The chief contractor is Mr. Bellerby, of York.

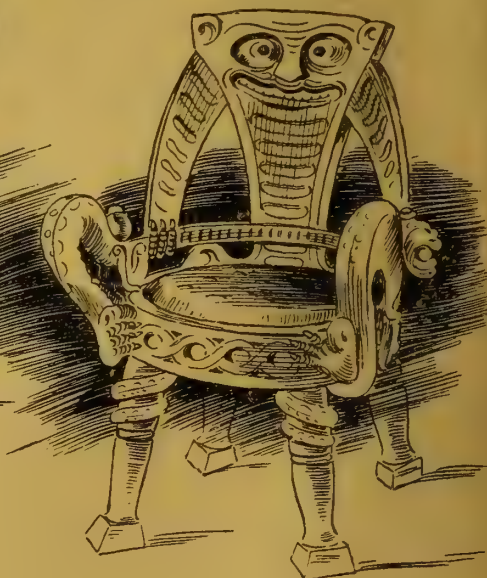
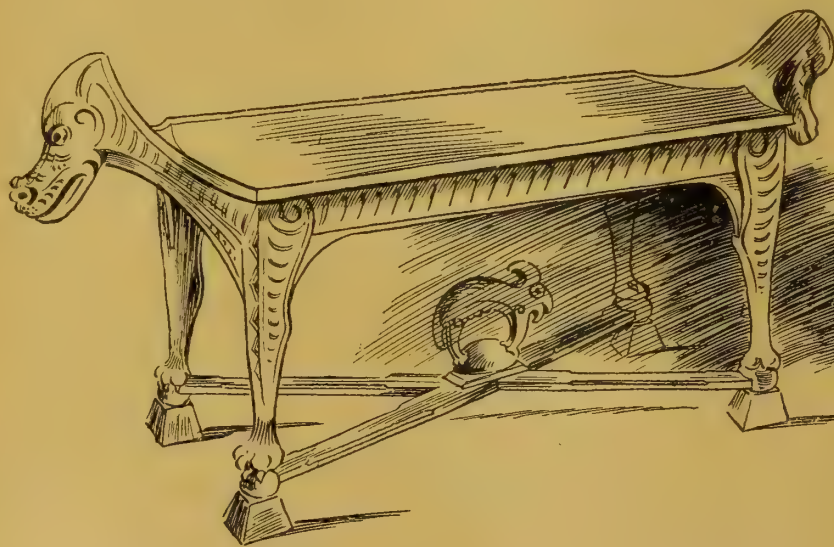


## TWO SUGGESTIVE STAIRCASES IN WOOD



Sketches at Christies.

TABLE AND CHAIR BOTH MADE IN LIGHT OAK PARTLY GILT & PAINTED.



Curious Norwegian Furniture.  
in the style of the Vikings.

A. C. Chancellor del.









E.W. POLEY, A.R.I.B.A.  
Architect

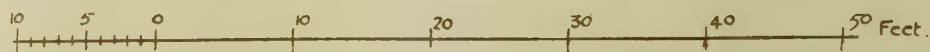
"GLENROY" FINCHLEY. N. E.W. POLEY A.R.I.B.A. ARCHT.



Ground Floor Plan.



First Floor Plan.

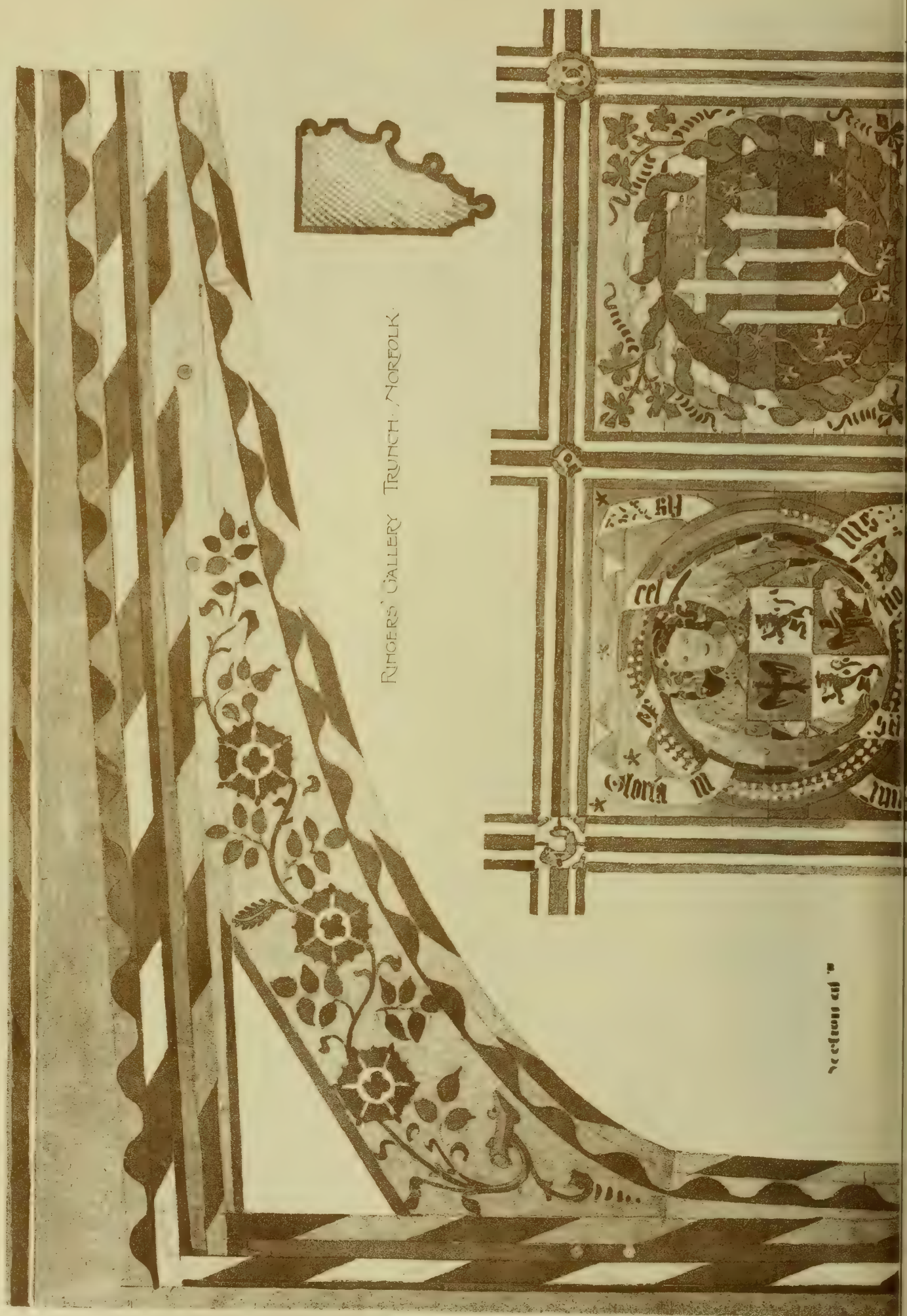






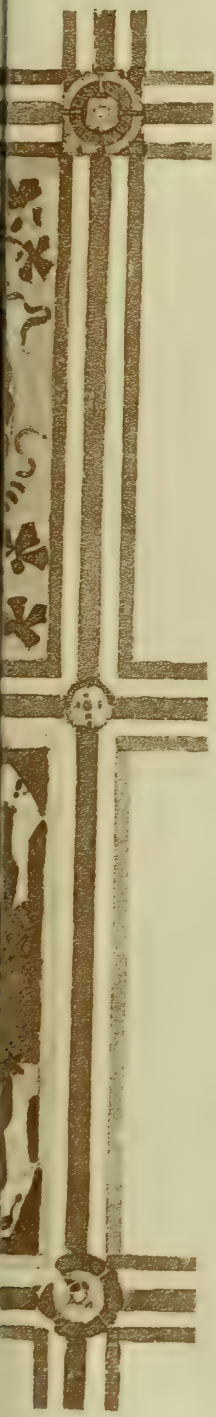


RINGERS' GALLERY TRUNCH, NORFOLK.



See also p. 10





NAVE ROOF · ST ALBAN'S ABBEY.

CHANCEL SCREEN · CASTLE ACRE.









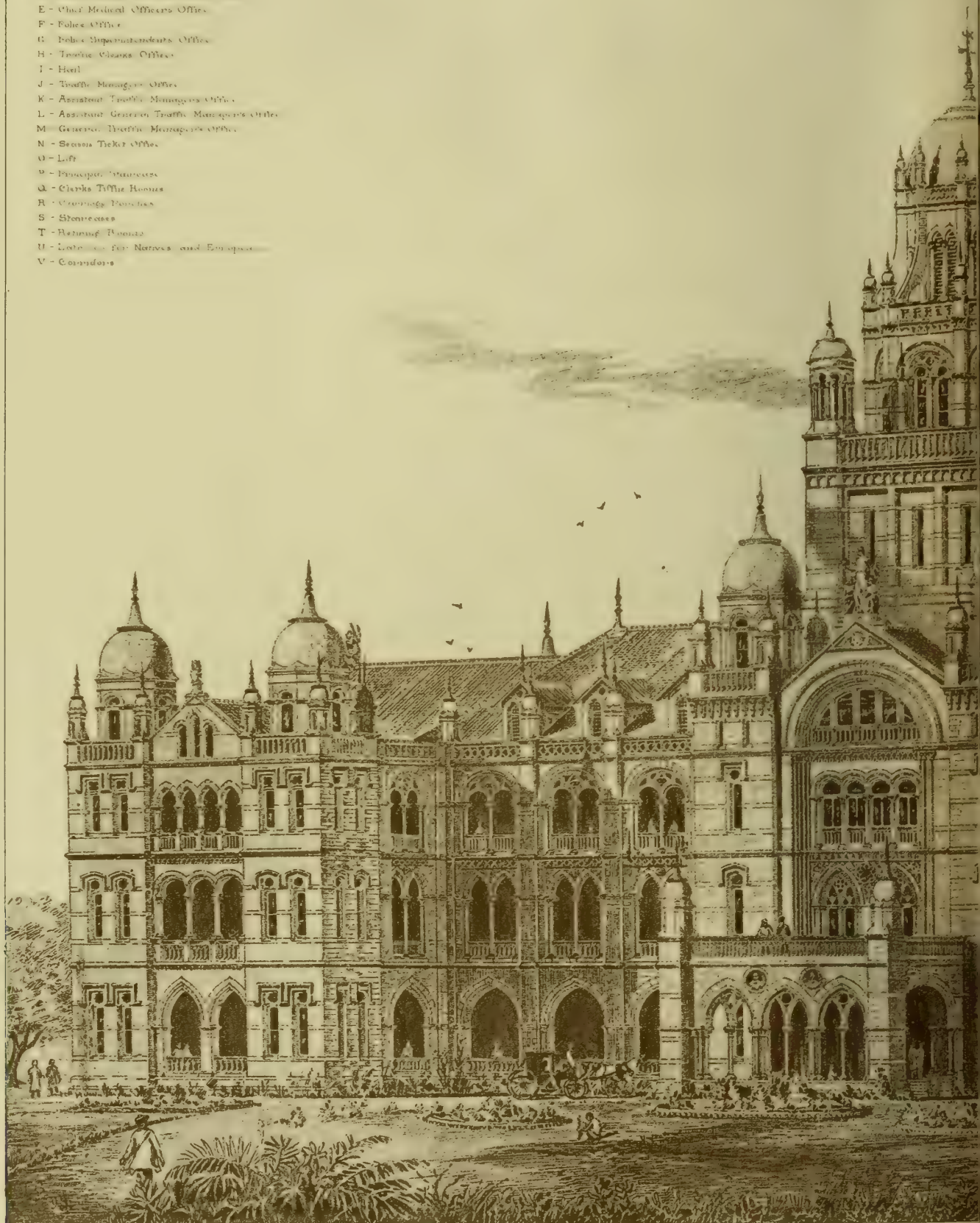




## NEW ADMINISTRATIVE OFFICES BOMBAY BARODA &amp; CENTRAL INDIA RAILWAY AT BOMBAY F. W. STE

— REFERENCE —

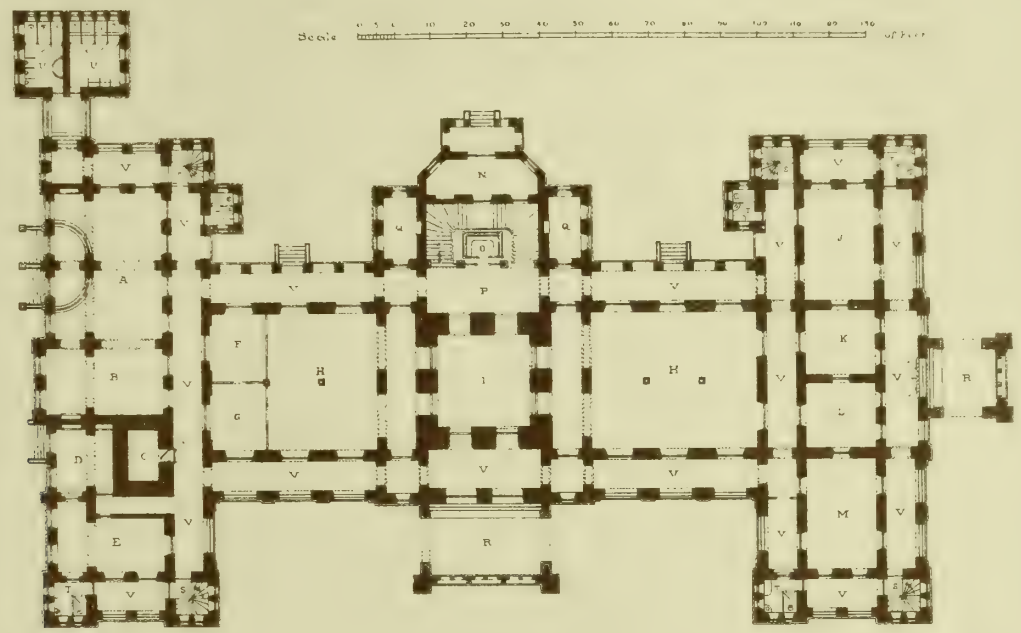
- A - Vault Office
- B - Customs Office
- C - Strong Room
- D - Chief Medical Officer's Office
- E - Chief Medical Officers Office
- F - Police Office
- G - Police Superintendents Office
- H - Traffic Clerks Office
- I - Hall
- J - Traffic Managers Office
- K - Assistant Traffic Managers Office
- L - Assistant General Traffic Managers Office
- M - General Traffic Managers Office
- N - Season Ticket Office
- O - Lift
- P - Passenger Staircases
- Q - Clerks Office Rooms
- R - Coaching Platform
- S - Stencils
- T - Waiting Platform
- U - Locomotive for Native and European
- V - Corridors



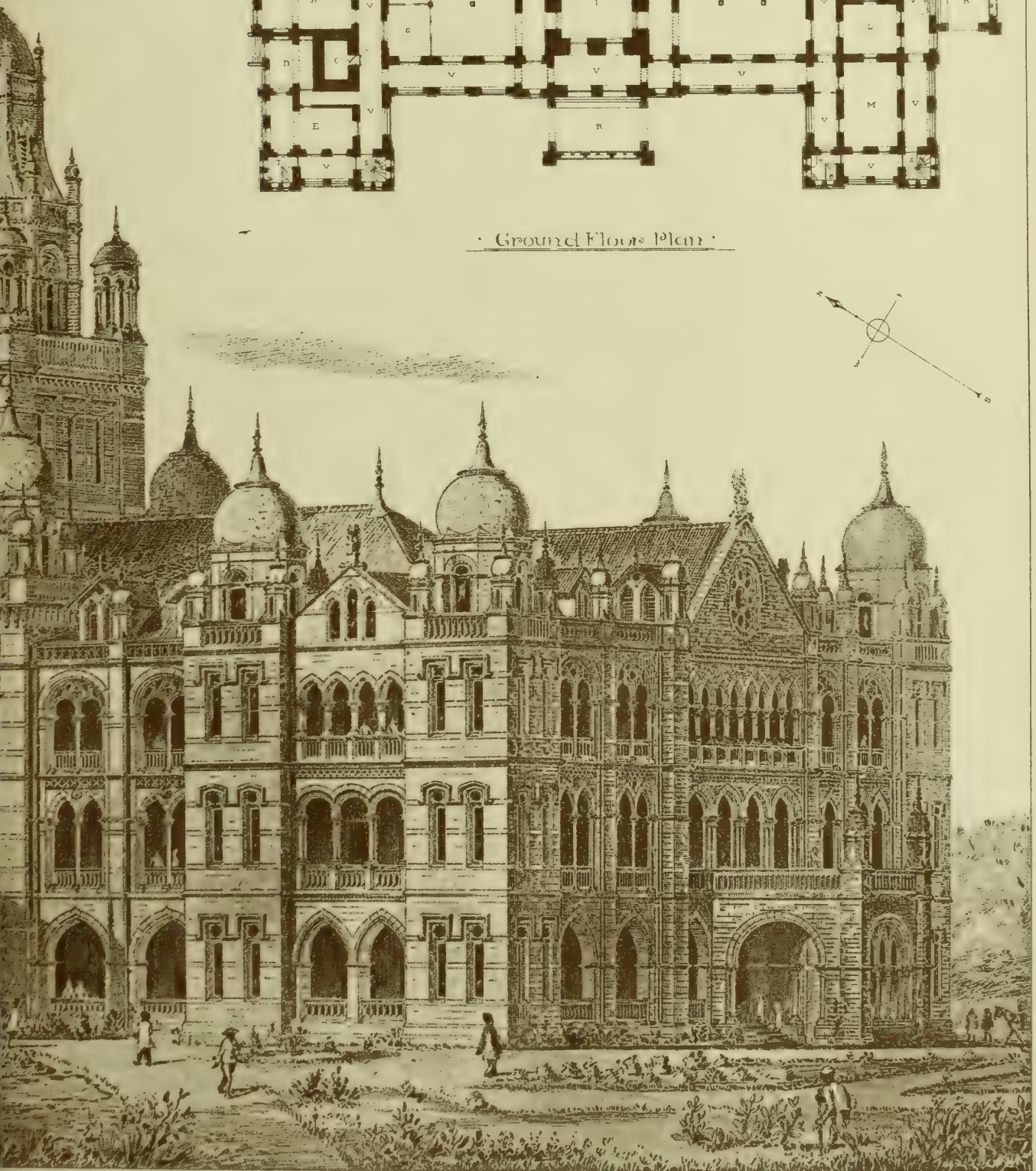


S. MAR. 20, 1896.

NS FRIBA ARCHT



Ground Floor Plan



"PHOTO-TINT" by James Akerman. Queen Square London W.











THE BUILDING DEWS, MAR 20, 1896.







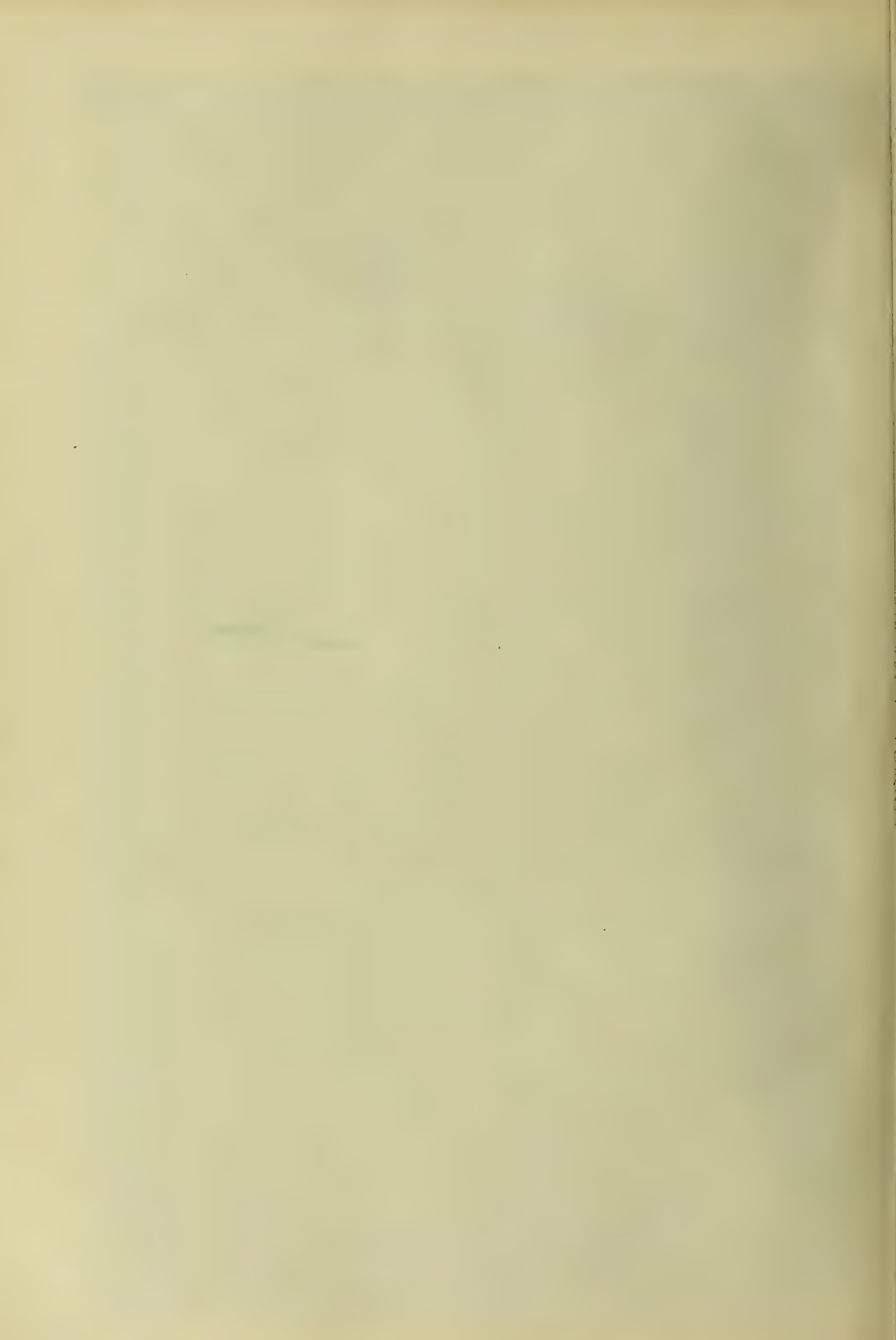
— PHOTO BY FRANZ HANFSTAENGL —

PHOTO-TINT BY JAMES ALCOCK. QUEEN'S MUSEUM, LONDON.

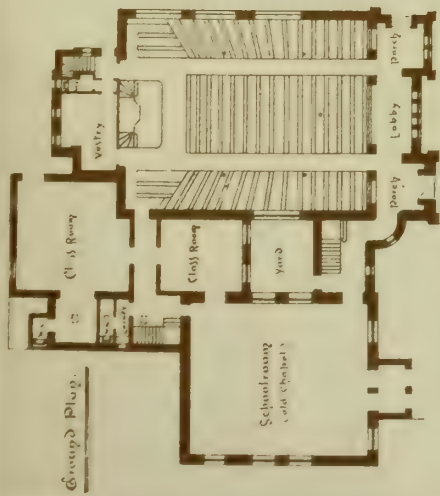
## OLD MASTERS · ON THE · CONTINENT · N° 31 ·

PORTRAIT OF WILHELM VAN HEYTHUYSEN (BRUSSELS) BY FRANS HALS (B. 1580 or '81 D. 1666) DUTCH SCHOOL.

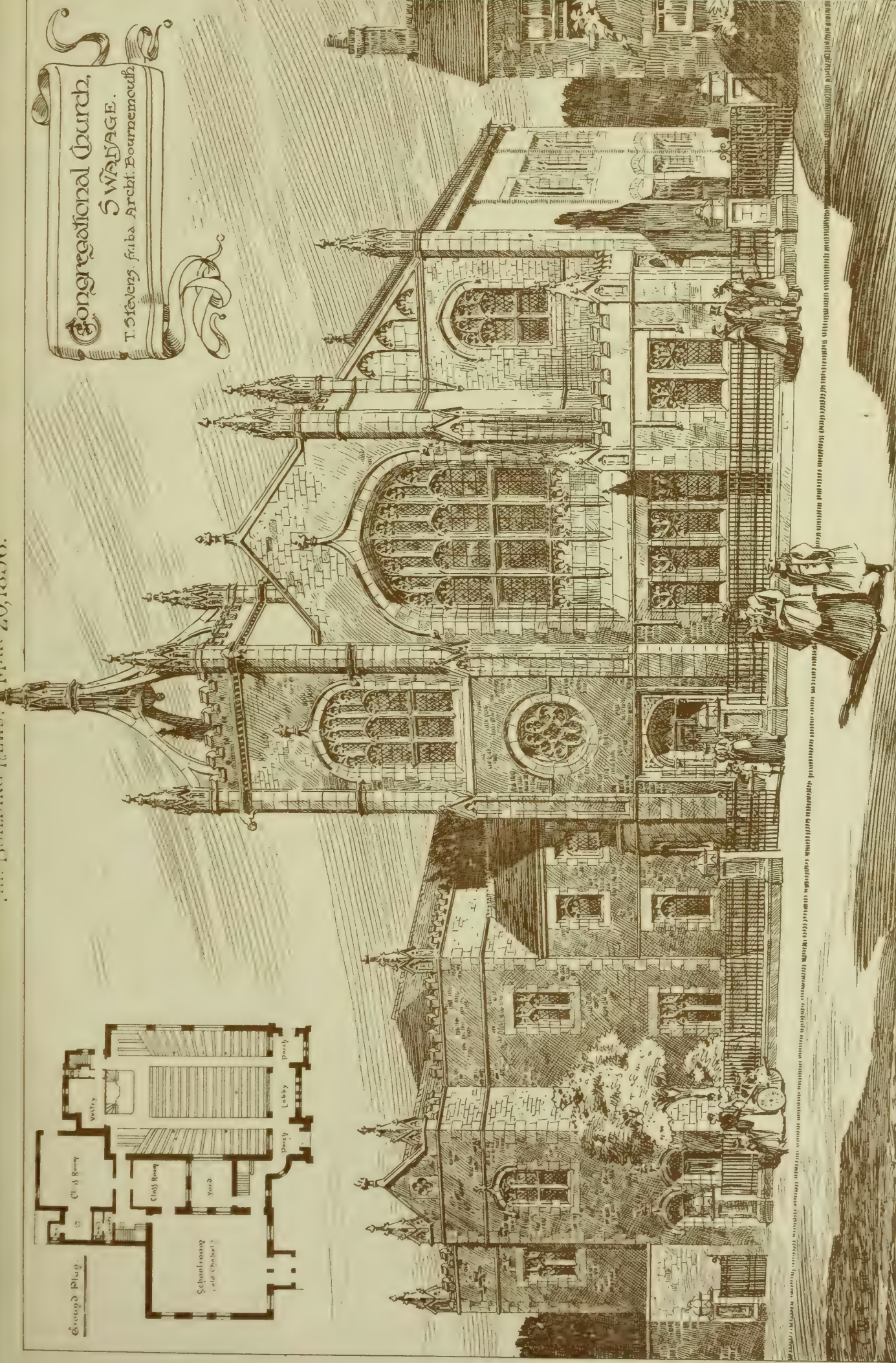








**Congregational Church,  
SWADAGE.**  
T. Stevens f. & b. Architects, Bournemouth.



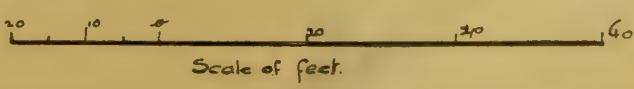








RESIDENCE COLWYN BAY:  
FOR  
EDMUND FARRAR ESQ<sup>r</sup> J.P.  
BERTH JONES. L<sup>r</sup> BARLOW, ARIBA  
BUILDER. ARCHITECT  
MANCHESTER:



BRIDGES & CO



## Building Intelligence.

**BIRMINGHAM.** The new building for Messrs. BIRROW, Ltd., tea merchants, &c., situated in Dalton-street (on the Birmingham improvement scheme area), is now completed. It consists of three-story dwelling-house, with ornamental stone and brickwork in the front elevation, and three-story stable building. The ground floor consists of six large van houses, 10ft. in height, and loose box; the first floor of 16 stalls, two loose boxes, and harness-room (match-boarded round walls), all of which are 12ft. in height; and the second floor of three store-rooms, of a total length of 72ft. and 82ft. in width, with skylights on each side and louver ventilator, 12ft. by 8ft. in centre. The total cost of erection, including fittings and the installation of the electric light, was nearly £3,000. The architect was Mr. John Statham Davis, of Dolobran-road, Sparkbrook, and the contractor Mr. Thomas Rowbotham, of Coventry-road, both of Birmingham.

**GATESHEAD-ON-TYNE.**—Building operations have commenced for a new savings bank for Gateshead, being a branch of the Newcastle-upon-Tyne Savings Bank. It is situated at the angle of two of the principal thoroughfares, and the plan consists of a banking-room 37ft. by 26ft., well lighted on two sides, with an entrance at the corner of the street. A strong room and conveniences at the rear, with cellars for coals, &c., in the basement. A private door leads up to board-room and caretaker's rooms. Conveniences to the former are planned on a mezzanine floor off main staircase. The building is designed in the Renaissance style, with polished granite base, Kenton stone up to the first floor level, relieved with red Dumfries stone, and the upper portion in red brick, with stone dressings. A small copper dome will complete the angle. The roofs will be covered with green slates. The floor space in front of the public counter is proposed to be laid with marble mosaic, and the wall panelling, doors, &c., in oak. The strong room will have a steel lining built into the brickwork. Adamant will be used for plastering. The banking-room windows will have wood frames with the upper portions to open; the other windows will have steel casements with lead glazing. The warming to bank will be by patent ventilating stoves. Tenders were invited, and that of Messrs. Haswell and Waugh, of Gateshead, for £3,615 has been accepted, and the work is expected to be finished by the end of the present year. Mr. Burnett is acting as clerk of the works, and Mr. Stephen Piper, M.S.A., of County Chambers, Westgate-road, Newcastle, is the architect.

**GLASGOW.**—The new Family Home—the first institution of the kind established in the world—just erected by the Glasgow Corporation in St. Andrew's-street, off the Salt Market, was formally opened on Saturday. The Home is for widows and widowers with young families, and, like the model lodging-houses owned by the city, has been erected by the City Improvement Trustees, on ground belonging to the corporation. No outlay has been made in external ornamentation of the Home, which is a plain Queen Anne structure consisting of two four-story blocks, built in T form. There are 165 bedrooms in the building, each capable of accommodating a widow or widower and one, two, or three children; an adult dining-room, a recreation-room, children's play-rooms, day dormitories, and a crèche. There are also large and small public kitchens, bath and lavatory accommodation, and a small playground. Each bedroom is furnished with a chest of drawers, an iron bedstead and bedclothes, a table, two chairs, and a looking-glass. The building is heated by steam, and lighted by electricity. For a bedroom, with key, the charge is to be 5s. a week, or £13 a year, exclusive of food. The total cost of the building, exclusive of the site, is £16,000, and the structure was designed by Mr. A. B. McDonald, the city architect.

**LONDON COUNTY COUNCIL.**—At Tuesday's meeting of the Council the Fire Brigade Committee presented a report complaining of the excessive cost of jobbing works executed by the Works Committee's department at certain fire-stations. It was stated that on twenty-four accounts there was a total cost of £569 above the architect's revised estimates, and the opinion of the architect was quoted that the excess was unnecessary. Mr. Ward, chairman of the Works Committee, and Mr. James Stuart, M.P., condemned the

hostile attitude assumed by one committee towards another. Mr. Burns declared that since the alteration of the system the Works Department had shown a profit of from ten to three per cent. If the Moderate members would only acknowledge the truth, the jerry-builders would be routed, and the Works Department would be vindicated. After some further discussion, the consideration of the report was adjourned, as was also that on a long report by the Works Committee on the same subject. An adjourned report of the Corporate Property Committee recommended a further expenditure of £750 on the preparation of a ground plan of London. This was agreed to. It was stated that the total cost of the plan was estimated at £4,000.

### CHIPS.

Archbishop Eyre laid on Tuesday the memorial stone of the new Roman Catholic church for the congregation of St. Patrick in the Anderston district of Glasgow. The building, which is situated at the junction of North and William streets, will be Gothic in style; it will accommodate about 1,000 persons, and its cost is estimated at £20,000. The material used is red Locharrbrigg stone, and Messrs. Pugin and Pugin are the architects.

The west tower screen placed as a memorial in the parish church of St. Stephen's at Hilmarton, near Calne, was dedicated on Wednesday week. It has been designed by Mr. Charles E. Ponting, F.S.A., of Lockridge, Marlborough, and of 15th-century Gothic conception. Messrs. Harry Hems and Sons, of Exeter, carried the work out in English oak.

The lecture arrangements after Easter at the Royal Institution include—Mr. W. Gowland, three lectures on "The Art of Working Metals in Japan"; Dr. Robert Munro, two lectures on "Lake Dwellings"; and Professor W. B. Richmond, B.A., three lectures on "The Vault of the Sixtine Chapel."

At a general assembly of the Royal Scottish Academy held in Edinburgh on Wednesday, Sir George Reid, president, in the chair, the following gentlemen were elected Associates of the Academy:—Mr. J. Thorburn Ross and Mr. R. Payton Reid, Edinburgh; and Mr. Wellwood Rattray and Mr. James Paterson, Glasgow.

Messrs. Fambriani and Daniels' architectural concrete works, Lincoln, have again been successful in securing the third contract for schools in Boston, as, in addition to supplying for the Staniland and middle class schools, they have now in hand the whole of the dressings for Park schools, in the same town, Mr. Jas. Rowell again being the architect, and Mr. J. Lucas the contractor.

An effort is being made to raise the remaining £700 of the £1,600 required for restoring the parish church of St. John the Baptist, Hale Magna, Lincolnshire. The chancel was entirely destroyed some years ago, but the nave and north aisles are excellent specimens of Late Decorated work, and the south aisle and north are Early English in character. The work desired to be done includes a new roof to the nave and south aisle, new floors, new seats (the present pews being deal "boxes"), raising the floor of the eastern bay, and adapting it as a chancel; repairs to the tower and pinnacles; repainting, replastering, and renovating the walls, piers, and arches; reglazing fourteen windows, recasting and rehanging the bells; and draining;—all of which is estimated by the architect, Mr. Hodgson Fowler, F.S.A., to cost £1,500, exclusive of professional fees and other expenses.

The Duke and Duchess of York visited Leyton on Wednesday, and opened the new Municipal Buildings and Technical Institute which have just been completed in the high road, at a cost of £25,000. The buildings are English Renaissance in style, and are faced with red bricks and Portland stone. Mr. J. Johnson is the architect, and Mr. F. J. Coxhead the builder.

A belvedere tower, nearly 200ft. in height, similar to those erected at the World's Fair, Chicago, and at the Paris and Philadelphia Exhibitions, will be erected this season at the Empire of India and Ceylon Exhibition. The tower will be provided with two passenger lifts, and have several balconied stories. The top platform will accommodate about 100 persons. The tower will, at night, be illuminated by a lighthouse lamp of 4,000,000 c.p.

Complaints having been made of the insufficient accommodation for clerks at Gwydyr House, Whitehall, the office of the Charity Commission, plans have been prepared by H.M. Office of Works for a small extension of the building into the garden at the south. The new rooms will be placed at the back of this garden, and will not extend along its full length. It is proposed to remove to the front of this garden facing Whitehall the bronze statue of James II. by Grinling Gibbons, which is at present hidden away in the court behind the Banqueting House.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**DEVON AND EXETER ARCHITECTURAL SOCIETY.**—The annual meeting of the Plymouth, Devonport, and Stonehouse branch of this society was held on Monday last at the School of Art, Princess-square, Plymouth. Mr. Charles King was elected chairman, and Messrs. M. Alton Bazeley, J. H. Dwyer, H. G. Luff, A.R.I.B.A., J. Paton, and B. Priestley Shires, A.R.I.B.A., were appointed as committee of management; and Mr. Edgar M. Leest was elected honorary secretary and treasurer for the ensuing year.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—Professor Patrick Geddes delivered a lecture on Wednesday week before the members of the Edinburgh Architectural Association on "Town and Gown: Some Conjoint Possibilities of Architecture and Education in Edinburgh." He gave a survey of the historic development of Edinburgh from feudal times onward, and more particularly through the successive periods of modern architecture. Thus in Parliament House or Register House, he said, they had the ascendancy of law, in the monuments and museums of history and romance, in the churches of religion, in the banks, insurance offices, Drumsheugh Gardens, distilleries, and railway stations of capital, and finally in the school of medicine or the McEwan Hall, in the asylum or observatory, the influence of education.—On Saturday about forty members of the association visited the ancient Castle of Dundas and Kirkliston parish church, under the leadership of Mr. John Watson, architect, who described the features of both structures in detail. He traced the history of Dundas Castle from the time of its erection in the first half of the 15th century, and said it formed a good example of the accommodation provided in the residence of a wealthy baron of that period. As to Kirkliston parish church, he said the ancient portion of it was a valuable example of the Transitional period, erected probably about the close of the 12th century.

**THE SURVEYORS' INSTITUTION.**—The annual dinner of the Surveyors' Institution was held on Wednesday night at the Hotel Metropole, Mr. Daniel Watney, the President, in the chair. Amongst those present were Sir R. E. Webster, Q.C., M.P. (Attorney-General); Sir W. T. Marriott, Q.C.; Lieutenant-Colonel Sir G. A. Leach, Sir Arthur Arnold, the Right Hon. Jesse Collings, M.P.; the Hon. H. Plunkett, M.P.; Mr. Coningsby Disraeli, M.P.; Judge Meadows White, Judge Lumley Smith, Mr. Sheriff Pound, Mr. W. Thielson-Dyer, Mr. E. J. Castle, Q.C.; Mr. G. M. Freeman, Q.C., and others. Mr. Jesse Collings and Mr. C. Disraeli responded to the toast of "The Houses of Lords and Commons"; Mr. E. P. Squarey proposed "The Bench and the Bar." Judge Meadows White responded for the Bench, and the Attorney-General, in replying for the Bar, referred to the loss which the profession had suffered in the death of Mr. Bidder. He attributed no small portion, if not the whole of his own success to expending 3 guineas in belonging to the Surveyors' Institution. He had heard it urged in some quarters that his profession was in a languishing condition. It was the duty of the surveyors to encourage the Bar as much as they could. They did not lack material any more than mental force, and if the two professions in the future only went hand in hand they would go on to greater prosperity and usefulness in the future. The toast of "The Surveyors' Institution" was proposed by Judge Lumley Smith, and the president, in reply, referred with gratification to the fact that the Irish Land Agents' Association had recently been affiliated with the Surveyors' Institution. The remaining toasts were those of "The Kindred Societies," which was proposed by Mr. C. J. Shoppee, F.R.I.B.A., and replied to by Mr. C. Heath (president of the Royal College of Surgeons) and Mr. J. W. Budd (president of the Incorporated Law Society), and "The Visitors," which was given by Mr. G. M. Freeman, Q.C., and responded to by Sir Arthur Arnold, chairman of the London County Council.

Provided the appointments of officials are sufficiently advanced, the new National Portrait Gallery will be opened to the public on Saturday, April 4th, without public ceremony. The building has been erected, it will be remembered, at a cost of about £100,000, from plans by the late Mr. Ewan Christian; the contractors being Messrs. Shillitoe and Son, of Bury St. Edmund's.



## COMPETITIONS.

**WESTMINSTER.**—On Saturday last designs for the new buildings in Great George-street, Westminster, were received in select competition by the Council of the Surveyors' Institution for the new premises to be erected by that prosperous and enterprising society. Five architects were selected to take part in the contest, and £100 is to be paid to each competitor for the trouble of preparing his plans. The general arrangements of the intended offices were furnished to the architects. Mr. Aston Webb was asked, but declined to compete, as no architect assessor was to be appointed. The council considered itself well qualified to judge the merits of the designs, seeing that on the board are well-known professional architects.

## CHIPS.

The foundation-stone of a Roman Catholic school-chapel and presbytery was laid at Horsforth, near Leeds, on Sunday. The new school-chapel is being erected from designs by Mr. John Kelly, of Leeds and London, the cost being estimated at £1,855.

A new water-supply for Dunbar, N.B., provided at a cost of £3,000, was inaugurated on Saturday. The source is the Cauld Burn on the north side of the Halls, and about five miles from the town, and the work has been carried out under the supervision of Mr. Moody, burgh surveyor of Dunbar.

Internal alterations, including refooring with wooden blocks, and new seats of Karri pine, are about to be carried out at St. Andrew's Church, Montpelier. Mr. J. Bevan, of Bristol, is the architect, and Messrs. Hatherley and Carr, of the same city, are the contractors; the outlay will be about £800.

To-morrow afternoon at 3 o'clock (Saturday), the Architectural and Engineering Society of the Polytechnic in Regent-street will visit the Passmore Edwards Public Library in the Uxbridge-road, Hammersmith.

At the Oddfellows Hall, Cleethorpes, on Friday, Colonel W. L. Coke, M.I.C.E., Local Government Board Inspector, held an inquiry into an application by the Cleethorpes district council for sanction to borrow £1,636 for the purpose of building new council offices and making certain street improvements.

In the schedule of the Naval Works Bill the estimate for the Keyham Dockyard extension has been increased from £1,920,000 to £3,175,000. On this revised estimate about £820,000 is due to the addition made to the original outline plan, and to the provision of a sum of £175,000 for fixed machinery of a permanent character. The remaining excess over the original estimate is due to the fact that the great depth at which the rock is met with in places necessitates a large outlay on the under-water foundations.

Mr. B. T. Batsford will publish in a few days a History of Architecture by Professor Banister Fletcher and Mr. Banister F. Fletcher. It is on a new and comparative basis, and is illustrated chiefly by collotype plates.

The council of the Royal Scottish Academy have introduced a complete installation of incandescent gas lighting into their galleries. Though there were formerly 420 gas burners arranged in sunlight form in the several octagons, there were many complaints last year that the galleries in the evenings were inadequately lighted, and that the pictures, therefore, could not be seen. Pendant brackets have been introduced into each of the octagons, with the lights arranged upon them in a circle. There are in all 70 lamps, all on the Welsbach patent system, in combination with a new form of bracket patented by Mr. Thomas Ferguson, West Maitland-street, Edinburgh, who fitted up the installation, which was opened on Saturday night.

At Friday's meeting of the River Wear Commissioners, it was reported that £289,000 had now been expended on the two new piers at the mouth of the river. The Roker pier has now been carried out 2,356ft. in solid structure; but the foundations have been carried out 300ft. further. At the south side, the pier has reached the length of 1,260ft., of a total of 2,690ft, so that they are not quite half-way out. The amount proposed to be expended during the ensuing year is £117,712, as against £127,124 in 1895.

Now that the work of partially demolishing the Glasgow Gaiety Theatre, prior to its reconstruction as the Empire Palace, has reached the stage at which it was originally intended to stop, it has been found that the walls are not in sufficiently good condition to justify their retention as part of the new building. It has accordingly been decided, on the recommendation of Mr. Frank Matcham, the architect, to raze the block to the ground, clear the site, and construct a completely new building.

## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—L. W. Ranelagh.—Artisan.—F. J. T. and Co.—J. E. S.—B. Farnley.—T. G. and Co.—B. W.

## "BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Clansman," "Potboy," "Invicta," "Fear," "Giles," "Pantile," "Oberon," "Pickwick," "Feasgar," "Canary," "Fac et Spera," "Venus," "Kaffir," "La Cigale," "Owl," "Breton," "Veller," "Moor," "Tadpole," "Saxon" (very late). "Una" (the "washing standing" in the current subject's conditions for a stable, refers to a horse-standing. The carriages would be washed in front of coach-house.

LIVERPOOLIAN.—(Mr. Francis Doyle won the first place, we understand, in the original competition for the Royal Insurance Buildings when the contest was confined to local architects. His present position, as selected architect, is the result of the second competition, was awarded him after the decision of the referee, Mr. Norman Shaw, R.A., had been made. We cannot believe there is any foundation whatever, in fact, for the rumour you name.)

## Correspondence.

## MASONRY AND STONECUTTING.

To the Editor of the BUILDING NEWS.

SIR,—Referring to Mr. Hervey Flint's interesting and practical paper under the above heading, a few passing remarks suggest themselves.

Both the President (Mr. W. D. Caröe) and Mr. H. W. Barnes hit the nail nearer on the head than the lecturer did in their respective remarks upon the failure of some of the magnesian limestone from the Anston Quarries, on the southern border line of Yorkshire, the material used generally in the construction of the Houses of Parliament. I remember visiting the quarries in question, in company with my friend, the late Mr. Lindley, of Mansfield Woodhouse, who probably knew as much about our building stones as anyone in the kingdom. At the commencement of the erection of the Parliament Houses, a clerk of works was sent to the selected quarry to

examine, and pass, or condemn, every individual block raised. He was a man who knew his work thoroughly, and not only knew, but did it, with the result that, as years went on, there were hundreds of blocks piled up that for some defect or other the official in question had not allowed to be forwarded to London. Had this course continued, there is little doubt but that all would have been well; but a fresh Government came in, and in one of the usual cheese-parings it was decided to save the clerk of works' salary at Anston by withdrawing him. This was done, and, official supervision no longer existing, the officially objected-to blocks were all sent on in due course, and built into the Houses. And for the rest of the time, as the President correctly remarked, the blocks, as quarried, were railed to London without any selection and indiscriminately. The wooden office the clerk of works occupied was still standing in the midst of the quarry at the time of my visit.

When Mr. Flint referred to granite as practically imperishable, he overlooked other points not touched upon afterwards by Mr. Caröe. Granite is one of the poorest stones in the world to resist the action of fire. I was much struck by this fact when visiting Chicago shortly after the great conflagration. Iron and granite appeared to be the two materials that stood the intense heat the least. Brick chimneys were standing where granite buildings had gone to powder, whilst the twisting of the once red-hot iron girders pulled down stout party-walls by the wholesale.

The church of St. Peter at Lamerton (Lambertone in Domesday), in West Devon, is an example to point nearer home. It was destroyed by fire in November, 1877. Built largely of granite from the neighbouring Dartmoor, the arcades and walls burnt away to powder, and all save the western tower had to be rebuilt. That granite rots we have conclusive evidence in the modelling clay beds at Kingskerswell in the same county. This clay is pure and simply disintegrated granite.

One of the best illustrations I know of the excellence of Portland stone was afforded when old Westminster Bridge was pulled down—some 30 years ago. It was built of this stone, and many of the blocks when removed were reworked up for buildings at that time erecting upon the Grosvenor Estate in the West-end of London. I remember, as a journeyman, working a good deal of it myself, and not only on the surface, but right through, the Portland stone was half as hard again as are the blocks when brought in the usual way from the quarry.

Referring to the interesting fact mentioned—that the Saxon walls of the crypt of York Minster still show the tool-marks of the original workman—the quarries at Beer, on the South-East Devonshire coast, may be cited as affording another illustration of ancient tool-marks. The strata of stone in question covers a space of something like three by two and a half miles, and the workings (some of them over 1,000 years old) are underground. The more ancient of these may be seen just as they were left in the days when Exeter Cathedral was built, and the marks of the quarrymen's tools are everywhere in evidence. Further, the difference seen in the quarrying and tunnelling of the Saxon and Norman workmen, compared with those of the 14th and 15th century workers, is very marked.

Mr. Flint does justice to clunch stone when he speaks of its remarkable fineness of texture. There is probably no stone in England capable of being worked up more delicately; but it has a very fragile nature, and the least frost will "blow" a block all to pieces, if the latter is exposed to the atmosphere. The wonderful manner in which clunch is capable of being manipulated is evident upon the high altar screen at St. Alban's Abbey when viewed in contrast with the Caen stone high altar screen at Winchester Cathedral. Both screens belong to about the same date, both are identical, or nearly so, in ground plan and general conception, but the exquisite detail at St. Alban's is so far and away superior to that of Winchester, that one can readily imagine the material used at the former had something to do with the wonderful inspiration that, perhaps unconsciously, stimulated the 15th-century carvers to make their screen the greatest work of the age. Perhaps up to the time the high altar screen at St. Alban's was reared the finest example of delicate masonry and carving in our midst was the 14th-century sedilia in Exeter Cathedral. It is built of the Beer stone already referred to. The



Percy shrine at Beverley Minster is very disappointing after the Exeter sedilia. I am, &c.,  
HARRY HEMS.

Fair Park, Exeter, March 16.

#### A CAUTION.

SIR,—On Wednesday last a man called upon me saying he was an architect and surveyor, Mr. Duer by name. He then told me that in September last he lost his place in consequence of Messrs. Douglas and Fordham, of Chester, reducing their assistants; since then he had been out of employment, that he was starving, and that the only thing for him was to go and drown himself. I gave him 3s. 6d. (all the silver I had in my pocket), and told him to come to my office the next morning, when I would find him something to do for a week or so. He thanked me, and said he would come and be only too thankful. I telegraphed to Messrs. Douglas and Fordham at Chester, who telegraphed in reply to say they knew nothing about Mr. Duer.

I need hardly say no Mr. Duer turned up next morning. I hope to meet him again some day, but think it doubtful. I therefore send this in hopes he will find no one so charitably disposed as I was, and hope he may be handed over to the police to deal with should he apply to other architects for help.—I am, &c.,

A. WILLIAM WEST.

44b, Maddox-street, London, W., March 14.

## Intercommunication.

#### QUESTIONS.

[11487.] **Bakery.**—Will any reader kindly inform me of any book treating on the construction of a modern bakery, or give any information on this subject? oven construction, ordinary and two-deckers, boilers, steam presses, &c., suitable for a business using fifty bags of flour per week.—J. H. M.

#### REPLIES.

[11482.] **Coloured Concrete.**—In reply to your correspondent, who asks "how may concrete be coloured to imitate stone?" as far as I know, the only reliable and lasting way is to mix with the fine finishing stuff a sufficient quantity of common red oxide of iron. This does not bleach, and, if the moulds are well soaped, has very much the look of chiselled red sandstone. For inside work, generally speaking—as for floors, &c.—Spanish brown, Venetian red, or other cheap colours are generally good enough. It should be used in the same way, mixed with stuff used for floating the floors. In one building I am acquainted with, coloured concrete has been used throughout for dressings; it looks well, and after two years shows no signs of bleaching. X.

#### CHIPS.

A new bakery in Rainbow-street, Crewe, was formally opened last week. The buildings have been erected by Mr. J. R. Goulden, builder, from plans prepared by Mr. S. Dobson, architect, both of Crewe. The oven and appliances are from designs and patents of Mr. F. P. Tunks, of Willesden.

The works of water supply carried out for the Lostwithiel Corporation have just been completed. Mr. S. W. Jenkins, of Liskeard, is the engineer, and the contractors are Messrs. Oliver and Minear, of St. Blazey.

Messrs. Hele and Co., of Plymouth, have just erected a new organ at Marylebone Presbyterian Church, George-street, Portman-square, London, W.

A new Free Church for Oban has been erected on the site of an iron church which was wrecked by the storm of December 22, 1894. The building is in the Gothic style, of Lorne granite, with a belfry of freestone.

The monthly report of the Labour Department states that employment is good in the building trades, the percentage of unemployed in unions making returns being only 2.5 compared with 3.7 in January. In February, 1895, during the frost, the corresponding percentage was 10.1. Employment in the furnishing trades has improved, the percentage of unemployed in unions making returns for February being 2.6, compared with 5.4 in January, and 8.7 in February, 1895.

The completion of the first section of the restoration of the parish church of Orford, East Suffolk, was celebrated on Tuesday week by re-opening services. Mr. J. T. Micklethwaite, F.S.A., of Westminster, is the architect, and estimated the outlay of the entire work at £10,000. The present portion has cost £2,300, and consists of a new roof, of English oak, placed over the nave. Messrs. Cornish and Gaymer, of Norwich and North Walsham, were the contractors. At the re-opening services the rector announced a donation of £2,000 from Lady Wallace towards the second section.

## Legal.

#### DAMAGES FOR ACCIDENTS.

**THE Employers' Liability Act, 1880,** is likely to be very much altered by the new Act by which it will be shortly superseded. One point that needs to be more clearly stated is as to the measure of damages. Section 3 of the existing statute provides that the amount of compensation recoverable under the Act shall not exceed a sum equal to the estimated earnings during the three years before the injury of a person in the same grade and district in which the workman was employed at the time of the injury. In the recent case of "Noel v. Redruth Foundry Co., Ltd." (*Times*, March 4), it had been held by the County Court judge of Cornwall that the accident had been caused to the plaintiff by reason of a defect in the machinery used in the defendants' business, from which finding the defendants did not appeal. But the County Court judge had gone on further to decide that, as the plaintiff was an apprentice receiving only 5s. a week at the time of his injuries, this section 3 could not apply, as it would be improper to say that so small a sum would be a fair compensation. The judge, therefore, assessed the damages at £80, and from this part of the judgment the defendant company now appealed.

It was urged for the defendants that, as the Act expressly provided a measure of damages for all cases coming within its scope, that could not be evaded. They were willing to give the plaintiff three years' wages at his present salary of 5s. a week, although for the two years preceding he had only had 3s. and 4s., and so to pay him £30 instead of £80, as awarded by the County Court judge. The plaintiff's counsel endeavoured to show that, as the plaintiff was really getting his training as well as the nominal wages, that training should be valued at something, and added to the amount. But the Court did not see how they could do this, when the word used by the Act was "earnings," and which they held could only include money, food, clothes, lodging, and the like, and so they reluctantly decided that the clause of the Act must be applied, and the £80 reduced to £30. But the result is so obviously unfair that we may hope the new Bill will provide for a case of this kind, in which the law has once more done an unintentional hardship.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

**QUESTIONS.—ROAD.—CLOSED.—PENALTY.**—1. Not unless it were dangerous, and not otherwise without providing an alternative route. (2) He seems to me to have exceeded his authority. (3) I do not think that, under the circumstances stated, any penalty could be recovered, or enforced.

New works of water supply are being carried out at Portrush, for the the Coleraine Rural Sanitary Authority. Mr. A. D. Williamson is the engineer, and Messrs. A. Maxwell and Co. are the contractors.

A new thoroughfare, known as "the Sandys-row Improvement," part of which is in Bishopsgate and part in Whitechapel, and which has been carried out at the joint charge of the London County Council and the City Commission of Sewers—the former contributing £89,875, and the latter £29,873—was opened on Friday by representatives of the Improvements Committees of both bodies. The total length of the new thoroughfare, which is 40ft. in width, is 1,200ft. The new thoroughfare runs from the junction of Wigate-street and Bishopsgate-street to Middlesex-street, which has also been widened to 40ft., in a south-westerly direction, opening up a direct line of traffic from Bishopsgate over the Tower Bridge.

In the Probate Division, London, on Friday, Miss Susannah Woolhouse, schoolmistress, Lincoln, obtained probate of the will of the late William Robinson, retired builder and bank director, Lincoln. The deceased, who was 80 years of age, met the plaintiff, and proposed marriage, but being rejected he made a will in her favour. The property was worth nearly £5,000, and the deceased's brother opposed probate. Ultimately a compromise was effected, the plaintiff agreeing to make provision for the testator's next-of-kin. The solicitor who executed the will stated that when he asked Mr. Robinson why he was omitting his widowed sisters the testator replied that he intended making another will later.

#### LEGAL INTELLIGENCE.

**SKY-SIGNS.**—THE SAVOY CASE NOT FOLLOWED.—At the Guildhall Police-court on Friday, before Mr. Alderman Truscott, Mr. James Dowling, 35, Jewin-street, appeared on an adjourned summons, issued at the instance of the Commissioners of Sewers, in regard to an alleged sky-sign. Evidence was given by Mr. Edmund Woodthorpe, district surveyor for the northern part of the city. There were certain skeleton letters on the roof of the defendant's house, and Mr. Woodthorpe described them as a sky-sign. In cross-examination, however, he said the sky was not visible through the letters. The Alderman said he had seen the alleged sky-sign, and was of opinion there was a technical offence, because the sky was partially visible. He thought it was a somewhat hard case, but if the matter was pressed he had no option but to make an order that the said sign be removed within two months.—Mr. William Harris, 32, Bishopsgate-street, Without, was summoned at the instance of the Commissioners of Sewers. Mr. Woodthorpe, the surveyor, said the sky-sign was an advertisement-board fixed on the top of the parapet. Cross-examined: There was no open work. Mr. Wildey Wright contended that it was not a sky-sign coming within the meaning of the Act. The Alderman held that it was a representation on a board in the nature of an advertisement erected over the building, which board was visible against the sky from the street. It was not open work, was one continuous face, and extended in height for more than 3ft. over the parapet. It was, however, entirely supported by the lateral supports of the adjoining buildings to which it was fixed. It did not extend in height above these walls, and was in no way supported by anything on the building. He therefore came to the conclusion that it was not a sky-sign within the meaning of the Act—a very difficult one to construe—and he therefore dismissed the summons.

**A LEEDS ARBITRATION CASE.**—An arbitration case was recently heard at the Leeds Town-hall, for the purpose of assessing the purchase-money and also the compensation to be paid by the Leeds Corporation to Mr. H. Elsworth Rawson in respect of property situate in Meadow-lane, and required by the corporation for the improvement of that thoroughfare. Mr. Horsfall, of Halifax, sat as umpire; and Mr. J. M. Fawcett, land agent and surveyor, and Mr. Thos. Winn, architect and surveyor, were respectively the arbitrators for the corporation and the claimant. The property sought to be acquired covers an area of about 542 square yards, and includes a house with premises in the rear, and two shops. Mr. John Hepper, auctioneer and valuer, of East-parade, Leeds, valued the furniture shop at £1,742, and the chemist's shop and house at £2,279. His total valuation was therefore £4,021. Mr. J. J. Mosley, land agent, of Wormald-row, Leeds, thought the furniture shop was worth £1,755 12s., and the other premises £2,417 16s., or together £4,173 8s. Mr. Chas. Scott, valuer and surveyor, of Bradford, valued the property for the claimant at £4,000. Evidence was given on behalf of the corporation by Mr. Thomas Ambler, architect and surveyor, who estimated the total value of the property, including 10 per cent. for compulsory purchase, at £1,782 16s. 6d. He was supported by Mr. W. D. Hollis, estate auctioneer and valuer, and Mr. Charles Myers, valuer, both of Leeds, who estimated the value of the property at £1,743 10s. The award will be announced in due course.

**AN ARCHITECT'S FEES.**—At the Hanley County Court on March 11, before Judge Jordan, John Lewis, architect, Newcastle, claimed £39 11s. from Robert Irving, draper, of Basford, for services rendered. The action had been remitted from the High Court. The case for the plaintiff was that by the defendant's instructions he prepared, in the year 1893, certain plans for a house which he proposed to build on some land in King-street, and he got out the bills of quantities, &c. For the former work he was to receive £25, with the usual charges for getting out the bills of quantities. The defendant in the first instance told the plaintiff he did not wish the total cost to amount to more than £600. The plaintiff told him he would do his best to keep it within the sum, but he could not guarantee to carry out all the defendant's wishes for it. The plans were made in accordance with the defendant's instructions, and approved by him, and tenders were invited from six builders. The lowest of these amounted to £720, and this, the plaintiff pointed out to the defendant, did not include the boundary-wall or the laying-out of the grounds. After consultation together, the defendant instructed the plaintiff to accept this tender. When Mr. Lewis saw the builders, they explained that the tender should have been £820; but they agreed to abide by it. The defendant afterwards wrote, reversing his decision, on the ground that the price did not include the boundary-wall. The defendant subsequently sold the land, and declined to pay the plaintiff his fees. Plaintiff claimed £25 for fees, the other £14 11s. being charged for quantities and preliminary sketches. In reply to his Honour, the plaintiff admitted that if the building had been carried out, the percentage for quantities would have been



paid by the builder; but he added that the defendant would have paid indirectly. It was submitted that the reason the defendant decided not to accept the tender was on account of the additional hundred pounds; but his Honour said it was clear, from the defendant's own letter, that it did not go off on that ground at all. He gave a verdict for the plaintiff for £31 and costs, including £15 paid into court.

**COPYRIGHT IN PHOTOGRAPHS OF MONUMENTS AND BUILDINGS.**—At the Lambeth County-court, on Tuesday, Judge Emden heard a case in which Messrs. Underwood and Sons, monumental sculptors, of Buckhurst Hill, sued Mr. J. W. Edwards, of Peckham, photographer, to recover damages for the detention of 18 photographic negatives of certain monumental works in the Metropolis. Mr. Underwood said that the defendant was engaged to take negatives of monumental works in various parts of London. He had thus acted for them from 1870 to 1888, the negatives in respect of which this action was brought being those taken between these dates. Mr. Lewis said his defence was that under the Copyright Act the negatives belonged to the defendant. Judge Emden: As a matter of law, this is so. There is a decision upon this very matter. I well remember it, because I was counsel; and by that decision the photographer was held to be the owner of the negative. Mr. Cartwright submitted that the transaction was a special one, for trade purposes, and the same rule applied as to that affecting zincos, lithographic card plates, or sunk dies. The judge, however, gave judgment for the defendant, with costs.

**A BUILDER'S PREMIUM WITHHELD.**—SMITH V. HOGG. This case, recently heard at Manchester assizes by Mr. Justice Vaughan Williams and a jury, was a dispute arising out of a building contract. Messrs. Smith Brothers, builders, Burnley, the plaintiffs, were asked by the defendants, Messrs. Hogg and Co., tanners, of the same town, to re-erect a tannery. Under the contract a certain sum was to be paid to the plaintiffs for the work, and it was stipulated that they should be paid in addition a sum of £10 per week for each and every week they should have the building ready for roofing before the end of November of the year in which the contract was entered upon. By extra diligence and the employment of extra men, they got the work done six weeks before the end of November, and they accordingly claimed the sum of £60 from the defendants. The defendants declined to pay, on the ground that because of their having permitted red sandstone to be used in the building instead of white stone that had been agreed upon, they had been freed from their obligation in respect of the payment of the bonus, and that in any event they were not liable for six weeks' bonus, as the building was not ready for roofing till eleven days before the time specified. The jury found for the plaintiff for £40, and judgment was given for that sum and costs.

The town council of St. Helen's, Lancs., have adopted plans for the addition of a pavilion containing 24 beds to the fever hospital, the estimated outlay being £6,500.

The directors of the Teign Valley Railway have gone to allotment in connection with the recent invitation to subscribe an additional £100,000, and announce that they have every reason to believe that the main line will be completed within eighteen months.

A commencement has been made with the erection of new buildings at Calderbank and Cleland for the accommodation of the Lanarkshire constabulary, in place of old buildings. The architect is Mr. R. Hamilton Paterson, Edinburgh. On the ground floor provision is made for the administrative department, having a separate entrance. The inspector's house, having a separate entrance, will also be on the ground floor. On the upper floor there will be two houses for married constables.

A new clock has been erected in the tower of Elsham Church, Lincolnshire, to the memory of the late Sir J. D. Astley, Bart., by the tenantry and friends on the Elsham Estate. The clock was set in motion by Miss Astley on Friday evening, the 13th inst. Mr. J. Davey, Worlaby House, was hon. sec. of the fund, and the clock was made and fixed by Messrs. W. Potts and Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne, who are now erecting the large clock at Sheffield new town hall, and another in memory of the late Sir Jno. Cowell, Clifton Castle, North Yorks.

The Highland district committee of Perth County Council considered recently the plans and estimates for the erection of two new bridges in the Glenlyon district. The first was one to be erected at Keltney Burn, from plans by Sir William Arrol, in place of the present bridge, which was declared dangerous for traffic; together with road approaches, the new bridge will cost £1,500. The second scheme is for the erection of a bridge at Comrie Ferry, at a cost of £1,275. It was decided to offer a guarantee of one-half the cost of the Keltney bridge, and one-third of that at Comrie.

## WATER SUPPLY AND SANITARY MATTERS.

**THE CLARE-MARKET IMPROVEMENT SCHEME.**—The Home Office inquiry in regard to the scheme of the London County Council for the improvement of the Clare-market district of the Strand has been continued before Mr. Steward, Commissioner. Mr. Young, surveyor to the London County Council, stated that it was proposed to rehouse 500 of the persons displaced on the cleared area, the remainder being sent to the Millbank site. The witness was cross-examined by counsel representing the owners of property to be taken. He thought the scheme should not be cut up, but carried out as a whole. The total area proposed to be taken by the scheme was 230,511 sq. ft., out of which the present proposal was to deal with only 31,612 sq. ft.—at least, they had no definite proposal with regard to the balance. The total number of persons to be displaced was 3,038, of whom 403 were at present actually engaged in trade on the area, and 681 were dependent on occupations in the locality. Mr. R. Vigers, surveyor to the Peabody Trustees, considered the scheme a very fair and proper one. Mr. T. Blashill, the architect to the London County Council, also gave evidence in favour of the scheme. The inquiry has been adjourned until to-day (Friday), the 20th, the Commissioner promising meanwhile to inspect the area.

## CHIPS.

At a parish meeting held at Falmouth it has been decided to restore the parish church in accordance with plans prepared by Mr. E. Sedding, of Plymouth. The works will include a new roof to nave, new chancel, removal of north and south galleries, restoration of western gallery, and alterations to the organ, while the tower will also be repaired.

The south-west chapel of St. Paul's Cathedral, formerly the Consistory Court of the Chancellor of the Diocese of London, and until lately occupied by Alfred Stevens's memorial to the Duke of Wellington, has been restored to its original design as a place of worship, by making it the baptistery for the Cathedral. The marble font, which used to stand under one of the arches of the south aisle, is erected at the west end of the chapel.

In the House of Commons, on Friday night, a long discussion took place upon the Bill promoted by the Dysart Trustees to inclose land on the banks of the Thames at Richmond, which was rejected by 262 to 118.

A parlour screen has just been placed in Fowey parish church as a memorial. It is of carved oak, and was designed many years since by the late Sir Gilbert Scott. It is Perpendicular in style, and has been carried out by Messrs. Harry Hems and Sons, of Exeter.

A Local Government inquiry was held at the Leeds Town Hall on Friday and Saturday, before Mr. S. W. Willcocks and Dr. Theodore Thomson, relative to the scheme of the corporation for clearing a large insanitary area in East Leeds. The cost of carrying out the whole scheme is estimated at between £300,000 and £400,000.

A public improvement in the Cemetery-road at Scarborough is approaching completion. The old thoroughfare, along which the majority of funerals had to pass, contained some awkward gradients, the steepest being 1 in 12, but under the altered conditions the steepest gradient will be 1 in 18. The total length of the improvement is 700 yards, and the roadway has been widened from 28 ft. to 45 ft. Sixteen thousand cubic yards of filling-in and levelling-up, 5,000 yards of road formation, 3,300 yards of footpath formation, and 1,100 lineal yards of kerbing have been done.

A new elementary school in Beech-street, Crewe, erected jointly by the ratepayers and the L. and N.W. Ry. Co., was formally opened on Thursday evening in last week. Accommodation has been provided for 836 children, at a cost, exclusive of site, of £3,500, being at the rate of £4 3s. 9d. per head.

A new Wesleyan chapel was opened last week at Stephen Hill, near Rammoor, Sheffield. Mr. W. J. Hale was the architect, and Mr. C. H. Gillam the contractor for the chapel, which is built of local stone.

The Duke of Westminster has begun the work of removing the houses which more immediately surround Grosvenor House. The block which faced Park-street and abutted on the south-east corner of the gardens of Grosvenor House is gone, and a brick and stone wall is being erected round the site, which will be added to the gardens. The whole of the south side of Upper Grosvenor-street is to follow in time as the leases fall in.

At a meeting of the Taunton Rural District Council held on Friday, Mr. T. C. Crump and Mr. J. J. Goode were appointed to the combined offices of surveyor and sanitary inspector in the northern and southern districts respectively.

## PARLIAMENTARY NOTES.

**LONDON WATER TRUST.**—In the House of Lords, on Monday, a Bill was introduced by Lord James, of Hereford, for the better control and regulation of the water-supply to the Metropolis and the surrounding districts. The measure is framed on the assumption that the management of the water-supply of the Metropolis and the adjacent districts ought to be placed in the hands of a responsible public body, while the whole area supplied by the eight existing water companies extends over 620 square miles, only 120 square miles of that entire area are included within the jurisdiction of the London County Council. The large outside districts would be, the Government considered, entitled to proper representation on the new body that would have the power of imposing rates and controlling their water-supply; and therefore it was proposed to create a water-trust, consisting of 30 members, and representative of all the various interests affected. Out of a population of 5½ millions, 4,213,000 were within the London County Council's jurisdiction; while of the total rateable value of property within the water area—viz., 41½ millions, about 30 millions were within the jurisdiction of the County Council. They had to legislate for the future as well as the present wants of a vast population, which it was estimated would in another 35 years' time, exceed 11 millions, its growth being naturally greatest outside of central London. Taking all the elements of the problem into view, the Government suggested that the London County Council should have a majority on the new board. Of its 30 members 28 would be allotted to the different areas affected, and it was proposed to give 16 to the London County Council and two to the Corporation of the City; while the County Councils of Middlesex, Essex, Kent, Surrey, and Hertford, and also the Conservators of the Thames and the river Lea would also be represented. The County Councils would select the men to represent them on the trust, and might choose them from among persons outside their own body who had great knowledge and experience of such matters. The new body would receive very wide powers; it would have to deliberate in regard to the acquisition of the interests of the water companies who must receive compensation, the terms of which would have to be arranged by negotiation, and would require the final sanction of Parliament after all the parties concerned had been heard. As a preliminary the water-trust would be invested with all the control over the water companies now vested in the London County Council, which might be usefully exercised until the property passed into their hands. After some discussion the Bill was read a first time.

**PLUMBERS' REGISTRATION BILL.**—Mr. Lees Knowles moved, on Friday night, the Second Reading of the Plumbers' Registration Bill, the object of which, he explained, was to enable plumbers who had passed a practical examination to obtain certificates. Mr. T. M. Healy asked whether there would be any action against a plumber who did his work badly. Mr. Lees Knowles quoted the instance of a plumber who, being called upon to take precautions against the freezing of the waterpipes, made the slight mistake of wrapping up the gaspipe in felt. Mr. Evans declared that the Bill was identical with that which the Committee had laughed out of the House last year. The debate was adjourned.

The building committee of the joint counties' lunatic asylum at Denbigh have under consideration plans for the extension of the building at an estimated cost of £76,000.

In the Queen's Bench Division, on the 12th inst., Henry Payne, commission agent, sued a builder named Brand for £300 damages, he having sustained personal injuries by falling on the footpath, at Bloomsbury, where the defendant had removed some flagstones. The jury awarded the plaintiff £400, and counsel then applied to amend the pleadings to secure the larger amount awarded. The judge deferred his decision on this point.

The annual congress of the British Institute of Public Health will be held within the University at Glasgow from Thursday, 23rd, to Tuesday, 28th July next. The congress will be arranged in three sections—Preventive Medicine, Chemistry, and Engineering in their relation to Public Health, and Municipal and Parliamentary.

A new floor, on the Fawcett system, is being constructed to the vestry at Keighley parish church. Messrs. W. and J. B. Bailey are the architects.

A new pulpit has been presented to Holy Trinity Church, Bardsley, which was dedicated last Friday. It is the work of Messrs. Earp and Hobbs, of London and Manchester. Dark-veined marble is used for the base and clustered shafts, and the upper part—octagonal on plan—is carried out in coloured alabaster, with sculptured panels of white alabaster, which are divided at the angles by small moulded columns of green marble, and the whole is surmounted with a carved cornice inlaid with bosses of Derbyshire fluorspar.



## Our Office Table.

THE Society of Architects, being desirous of eliciting the views of provincial architects on the Registration question, propose to hold a meeting at Cardiff on Monday evening next, and at Bristol on the following night, to which the best-known architects resident in each locality will be invited. The meeting on Monday will be held at the Library of the South Wales Institute of Engineers, in Bank Place, Cardiff, at 7.30 p.m., when an address will be delivered by the honorary secretary, Mr. Ellis Marsland, district surveyor for Camberwell, on "The Statutory Registration of the Profession." The President, Mr. Edwin J. Hamilton, of London and Brighton, will occupy the chair, and after Mr. Marsland's address, Mr. George Thomas, hon. local secretary for Cardiff, and member of council, will propose a resolution in favour of statutory registration, and discussion will be invited. On Tuesday evening a similar meeting will be held at the Guildhall, Broad-street, Bristol, Mr. Hamilton being again in the chair, when Mr. Ellis Marsland will introduce the subject, and Mr. Herbert J. Jones, of Bridge-street, Bristol, member of council, will move the first resolution, and open a discussion.

THE report of Mr. D. J. Ross, the engineer to the City Commission of Sewers, on the works executed by that body during last year states that the total length of sewers constructed was 928ft., of which 521ft. were on the lines of old sewers. Ninety-one cases of dangerous structures had been dealt with. A large number of street widenings and other improvements had been carried out. For widening the public way, notice was served to take certain houses in Basinghall-street, and when these had been set back the improvement commenced in 1861 would be completed. The widening of Fenchurch-street and Whitecross-street would soon also be finished. A new thoroughfare for pedestrians had been formed from Long-lane to Clothfair. The negotiations for acquiring the properties needed for completing the improvement of Upper Thames-street at its western end had been continued. The County Council had contributed one-half the cost of the widening at the junction of Ludgate-hill and St. Paul's-churchyard, £44,960. There is now a superficial area of 337,543 yards of asphalt and wood extending over a distance of 40,230 yards, or about 23 miles, in the carriageways of the City, and an area of 64,544 yards extending over 27,131 yards, or nearly 15½ miles, in the footways. This work of paving the streets with noiseless materials had been carried out during the last 25 years, and many of the streets had been paved more than once in that period. There were nearly 2,360 yards, or 1½ mile, of subways for gas, water, or other purposes in the City, and the lengths of mains and tubes laid down were over seven miles. The work of constructing a subway railway from the Mansion House to Waterloo Station had progressed eastwards as far as Bread-street Hill, and being of great depth beneath the surface there was no interference with either the sewers or public ways. The Commission had approved certain modifications in the scheme for forming a large central station beneath the open space in front of the Mansion House, reserving power to deal with the position and details of the staircases to the subways.

AN important discovery of a Roman camp has just been made on the borders of Sussex and Hampshire by some Ordnance Survey officers. The discovery was made on North Marden Down, two miles south of Harting, and not far from Petersfield, by Mr. S. J. Bennett, of the Ordnance Survey, acting under the command of Colonel Hedley, R.E. It locates a sixth Romano-British camp, supplementing the five other hill forts in the neighbourhood—that on the Harting Beacon, a mile round, discovered by Mr. Gordon in 1866; Tarberry, where the remains are chiefly British; Hemmer (Roman); British plateau fort at Kildevin Lane Copse; and Eckenfields, where traces of Roman occupation have been found. The new find is immediately south-east of Up-Park. It is partly on the Hornby property, but for the most part on the open Handle Down, though some of it is woodland, the largest of the three tumuli being at the north head of the wood. At the further point south there is an agger, 240ft. long and 6ft. high. Mr. Bennett found out this newly-discovered camp by measuring from the forts already

found, and remarking that there ought to be one in the place where he has since succeeded in locating it.

At the last meeting of the Cheshire County Council a discussion took place on the report of the committee recently appointed to consider questions relating to the vacancy that has arisen in the office of county bridge-master, surveyor, and architect through the death of Mr. Stanhope Bull. The general opinion appeared to be that the late Mr. Bull was much overworked. It was mentioned that he had, in addition to his numerous other duties, between 500 and 600 miles of main roads under his care, which was more than he could efficiently attend to. Dr. Hewitt emphasised the fact that the expenditure on main roads in Cheshire had risen from £54 per mile since the council was formed to £88 per mile, at which figure Cheshire, according to the Blue-book, stood higher than any other county in England, with the exception of Lancashire and the counties abutting on London. He urged the importance of an efficient check being kept on the urban authorities, who were every year trying to get more and more money from the council for their main roads. Mr. Beckett expressed the opinion that the money that had been spent by the council on the main roads had been spent wisely and advantageously. The whole matter was eventually referred back to the committee, with instructions to provide for an entire separation of the duties of the office of surveyor and bridge-master and the duties of architect.

At the last meeting of the Truro City Council, Mr. Silvanus Trevellick stated that the new Free Library would be opened on Thursday, the 30th April, by Mr. Passmore Edwards, who would be laying the foundation stones or inaugurating within three weeks of that date some eighteen buildings built at his cost. On the following day, Friday, May 1st, Mr. Passmore Edwards will open the Free Library and Municipal Buildings at Falmouth, and in the same week he will lay the foundation stone of the Free Library at St. Ives, for which designs have been prepared by Mr. John Symond and Sons, of Blackwater.

Amongst the items which appear in the Civil Service Estimates this session for the first time is a charge for sundry improvements in Hyde Park, including the erection of a refreshment kiosk and the electric lighting, not only of the bandstand, but also of the footpath between Marble-arch and Albert-gate. The water supply of Windsor Castle is pronounced to be so defective as to expose the fabric to serious danger in case of an outbreak of fire, and to remedy this an expenditure of £5,700 is proposed. The office of Works Estimates include £3,300 for enlarging the Charity Commission buildings, £3,500 for continuing the Patent Office extension, and £20,000 towards the new Record Office. In the Estimate for Revenue Departments provision is made for a new Custom-house at Cardiff, a new laboratory and sanitary works at Somerset House, extensive alterations in the General Post-Office West, the erection of a new office for the West Central district in Holborn, the enlargement of the telegraph factory at Holloway, and the erection of new or enlarged post-offices at Derby, Southport, Sunderland, Greenock, and Perth.

The magnificent bust of Alexandre Dumas *filis*, which was left by him to the Comédie Française, was placed, on Monday, on a pedestal at the head of the grand flight of steps, between the busts of Balzac and Emile Augier.

The bridge committee of Glasgow town council discussed recently the proposal to build a new bridge across the river of Finnieston. Two descriptions of plans were submitted, and it was ultimately resolved to ascertain the probable cost of such a bridge.

Canon Gregory Smith is making a fresh appeal for funds to repair Malvern Priory Church. The hurricane did, he says, great damage to the church, especially to the tower, costing more than £1,300; this sum was raised last year. But now Mr. T. G. Jackson, A.R.A., reports that another £1,700 is needed for further repairs, of which necessity no one could be aware till the process of the work revealed it. The old stonework must be largely replaced.

The completion of Mr. W. B. Richmond's scheme for the decoration of the upper portion of the choir of St. Paul's Cathedral with mosaics will be celebrated at the afternoon service on Easter-eve (Saturday, April 4), when the Lord Mayor and the Corporation of London will attend in State.

## MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (TO-MORROW).—**Architectural Association. Visit to British Institute of Preventive Medicine, Chelsea Bridge-road, S.W. 2.30 p.m.  
Polytechnic Architectural and Engineering Society. Visit to the Passmore Edwards Free Library, Uxbridge-road, Hammersmith. Maurice B. Adams, F.R.I.B.A., architect. 8 p.m.  
**MONDAY.—**Society of Architects. Meeting at the South Wales Institute of Engineers, Cardiff. "The Statutory Registration of the Profession," by Ellis Marsland, hon. sec. 7.30 p.m.  
**TUESDAY.—**Builders' Clerks' Benevolent Institution. Annual Dinner at the King's Hall, Holborn Restaurant. 6, for 6.30 p.m.  
Institution of Civil Engineers. "The Thermal Efficiency of Steam-Engines," by Captain H. Riall Sankey. 8 p.m.  
Society of Arts. "The Colonies and the Supply of Dairy Produce," by C. R. Valentine. 8 p.m.  
Auctioneers' Institute. "Auctions: their Use and Abuse," by Jas. F. Field, F.S.I. 8 p.m.  
**WEDNESDAY.—**Society of Architects' meeting at the Guildhall, Bristol. "The Statutory Registration of the Profession," by Ellis Marsland, hon. sec. 7.30 p.m.  
Carpenters' Hall Free Lectures. "The Blackwall Tunnel," by A. R. Binnie, M.Inst.C.E. 8 p.m.  
Society of Arts. "Our Food Supply," by Professor James Lusk. 8 p.m.  
**THURSDAY.—**Society of Arts. "Kashmir: its People and Products," by Walter R. Lawrence, C.I.E. Imperial Institute. 8.30 p.m.

## CHIPS.

The chancel of Knighton parish church is about to be rebuilt from plans by Mr. J. L. Pearson, R.A.

The noble group of "Mr. and Mrs. Angerstein," painted by Sir Thomas Lawrence, has been purchased for the Louvre collection.

After being restored and renovated, consequent on the fire which occurred about a year ago, the Middle Church of Perth was reopened for worship on Sunday. The pillars and arches in the nave, and the pillars below the tower have been restored to their original state. The plaster and whitewash have been cleared away, while the architectural features of the arches and the triple window in the south transept are brought to view, and give an indication of the original interior of part of the old Church of St. John's.

During the last few weeks the Roman Catholic Church at Hassop has been undergoing internal restoration. The work has been executed by Messrs. Bennett, of Manchester. Reopening services were held on Sunday.

A memorial tablet to the late Archbishop Magee was unveiled in York Minster on Tuesday by the Archbishop of York (Dr. MacLagan). The tablet is of English alabaster, and has been erected in the north transept of the cathedral. In the centre is a brass, lettered with a long inscription in Latin, and over this are bronze shields, respectively charged with the arms of York and Peterborough; the style is Late Fourteenth-Century Gothic. The memorial has been designed by Mr. G. F. Bodley, A.R.A. (Messrs. Bodley and Garner, Gray's Inn), and executed by Messrs. Farmer and Brindley, of Westminster Bridge-road, S.E.

The annual loan exhibition of pictures at the Guildhall Art Gallery of the Corporation of London will be opened on April 21st, the private view being appointed for the 18th.

At Totley-rise, Sheffield, a new Wesleyan chapel has just been built at a cost of £1,350. The style is Gothic, and the dimensions 47ft. 6in. by 22ft. Mr. Joseph Smith, of Hartshead, Sheffield, is the architect, and Messrs. J. Vasey and Son, of the same city, were the contractors.

The City Commissioners of Sewers discussed on Tuesday the desirability of setting back the houses Nos. 98, 99, and 100, Fleet-street, between the Circus and Bridewell-lane, and agreed that on the receipt of an intimation from the County Council, they would be prepared to contribute one-half of the cost of the widening of Fleet-street at this point, the Finance Committee should be empowered to give the necessary notices. It was further resolved to include No. 101, Fleet-street, among the property to be notified. The Court also requested the Finance and Improvement Committee to consider and report as to the desirability of formulating a general scheme of improvement in the parish of St. Bartholomew-the-Great and the immediate neighbourhood by putting in operation the Housing of the Working Classes Act or otherwise.

A new biscuit factory has been erected at Hayle by Messrs. Hosken, Trevithick, Polkinhorn, and Co., Limited, and will be known as the Cornubia Biscuit Works. The building has been put up by Mr. A. Carkeek, Redruth, from designs by the late Mr. James Hicks, Redruth, and was illustrated in our issue of Jan. 24th last.



## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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## THE "CRIB."

MODERN architectural cribs are mainly of two sorts, the ignorant and the discriminative. The first kind discredits both himself and his profession; the latter are often transmitters and popularisers of the best art. In one way or another, the great styles of architecture have been transmitted mainly by men who know what to select out of the elements that are before them, and who have patiently contented themselves with winnowing the wheat from the chaff, and in handing down the more permanent elements of the style. Cribs are naturally spoken of with contempt; but when we come to think about it, their existence is perhaps a gain in disguise—they serve to point out the weaker from the stronger elements of art, and they certainly help to throw out in greater relief the work of more original men. If everyone designed fresh and beautiful things, it would be harder to discriminate, whereas now the quantity of bad and indifferent architecture, generally by men of the class we are considering, makes it comparatively easy to discover higher and better motives when they are to be found. Of course, the man who is content to copy or crib is more or less in demand. The average Englishman is satisfied with copies; he is not likely to pay more for an original if he can get a copy at much less cost. He is satisfied to hang on his walls inferior prints of well-known pictures, and he is certainly less disposed to trouble about the design of his house. So with the market for cheap copies and rubbishy-made German imitations, the crib is more likely to get on than his brother artist, who, with higher motives, could not condescend to do anything so paltry as to copy another's design. The crib, in fact, must form a very large proportion of every artistic craft, and under this general head we may include all mediocrities in art, who are content to follow the fashion or style ignorantly and vulgarly, or more or less correctly. He forms the staple of every mercenary industry, the ordinary architectural draughtsman and getter-up of competition drawings, designers in furniture, metal, ceramics, and glass.

One great difference between the discriminative and the ignorant crib must be mentioned: the former does justice to his original, and honours the author placed under contribution; the latter does infinite injustice to him, and brings his imitation into deserved ridicule and contempt. With the latter the evil of cribbing lies. No wonder the resourceful architect complains bitterly of the wholesale plagiarism of this class of copyists, and would, if possible, make it a statutory offence to steal his brains. We know of a few men in the profession who go so far as to decline to send their designs to the professional papers for this reason, under the mistaken notion that by so doing they are acting in their own interests—a short-sighted policy in these days of universal dissemination and the numerous agencies for reproduction. Mr. Secret, who pursues this policy, can only secure this immunity from pilfering so long as his design remains on paper, but is powerless to do so directly it is carried into execution. He may also take courage by the thought that a bad imitation recoils on the head of the crib, not upon the author of the original. Again, there are certain features and properties of design, which are common to all, and which everybody uses with more or less dis-

cretion. Plans for hospitals, schools, and the like which have been accepted, the broken gable, and every feature which makes up the properties of style, are in this way liable to be travestied. No one can say that Mr. Smith's design is a copy of Mr. Newstudy's, when all the separate features of the latter's design are to be found in the new street. It is only when there is a particular arrangement or combination of features that are new, and pleasingly associated, that an architect can claim to have invented anything; he then naturally becomes disgusted when Mr. Smith gives to the public a mutilated parody of his design. It is then that the real sting of stealing is felt. Upon the real author the revelation of the crib is as galling as a caricature of a play in a comic paper is to the dramatic author. The cribbed design is nothing less than a caricature, though an unintentional one, of the pilfered work; it is painful to the real author, but reflects obloquy on the artless copyist. The crib never sees where he has missed the point and spirit of the original; he makes this feature a little taller, or adds more ornament or detail to that, and so he manages to take away the very life and spirit of the design, and to evolve a weak and emasculated version. Such, at least, is the ordinary character of the crib-work; even if it is a close copy it has not half the interest, because there is something or other which he has not taken into account—a different environment or point of view, a bend in the street, altered material—any one of which things may render the design out of place, if not ridiculous. We have seen a beautiful church window copied, but irretrievably spoilt by the mullions and tracery being made thin and wiry. Mr. Norman Shaw must have seen plagiarised versions of his designs in every conceivable situation; but have not the domes of St. Paul's and of the Capitol at Washington been themselves travestied? Who has not seen the beautiful peristyle of the former heightened or attenuated, or the graceful proportions of the dome altered by giving a more pointed and stiffer curve? Street's Law Courts have been recently travestied in grouping and detail in a third-rate county town. Parodies of nearly every important edifice on the Continent have appeared. We have seen bad copies of the Louvre, the Doge's Palace, the Alhambra Palace, innumerable Roman and Florentine and Venetian palaces—and even Indian and Chinese temples and pagodas have been travestied. The "paste and scissors" and the camera have been responsible for reproducing some of the greatest treasures of literature and art; but it is the weak and mutilated copy that is so objectionable. Then, again, the "sneaking" from professional journals is a habit that has grown. No sooner has an illustration of some important building or competition design appeared, than a crowd of copyists are "on the job," and whole features of plan and elevation, and bits of detail from Mr. So-and-So's design are found introduced in the latest offices and shop designs, very much to the chagrin of the author, who finds his happiest thoughts plagiarised in the most reprehensible way. No doubt this is very shameful and very demoralising; but how can we prevent it? To one who will use his faculties, there are hundreds who seek the shortest cut by appropriating the ideas of others. But it is ten times worse when an improper use of designs is made. A literal translation of a man's work may not be so bad if the cribber is careful to reproduce it under exactly similar conditions; but it is grossly objectionable if he copies a thing without any regard for purpose except to save himself labour—it then becomes a theft of the most contemptible kind. We distinguish certain kinds of cribbing which are particularly objectionable: (1) Copying plans of buildings without any relation to condition; (2) copying a design in another,

or in other materials; (3) copies of features, wrenched from their proper connection; (4) copies that are meaningless. Under each of these heads we may say a good deal. Who has not seen a plan of a house built for Mr. So-and-So at some seaside resort, who has spent on it several thousands of pounds, taken bodily and made to do for a small suburban London house costing barely a thousand pounds? There is nothing so absurd as to see the planning of a country house reproduced in or near a town, where the circumstances are wholly changed. In our crowded suburbs we see, for instance, a copy of a *cottage ornée* that might do in a place in the Isle of Wight, but looks like a transplanted exotic in London. Or a plan is cribbed out of an English journal and actually published in an American book, as an example to follow where climate and social habits are so different. It is quite as unjustifiable to copy a design in a material for which it is not adopted. How often we see a stone elevation reproduced in brick, and contrariwise; a design for a chimney-piece made for wood actually copied literally in marble or cast iron. The original designer gets the credit or discredit, as it may be, of the translation. When wood is changed to metal and stone to brick, the crib may become a positive libeller of the original artist, and a double injury is done in the name of art. Another steals bodily from the illustrated pages of a building journal some feature like a tower, and transfers it to his drawing-paper without the slightest compunction. In its undigested form it does not fit the building to which it is attached; it looks what it is—a "sneaked" feature, neither growing out of the building naturally in its position, or appearing to belong to the same treatment. Again, we see a number of meaningless copies, designs which were intended for a particular purpose or situation, used for very different buildings. Mr. Titbit sees a doorway or a gable which pleases his fancy in an illustrated paper or a new building, and he goes and copies it in Mr. Brown's new premises, where it is wholly out of place. A window suitable for a city bank or insurance office is cribbed, and introduced into a block of dwellings where small and simple openings are required; in another instance an oriel window designed for a domestic building is copied in a warehouse. Cribbers commit strange freaks in details, from the simple lack of common sense. "No class of building except the warehouse is subjected to more hard wear than a block of offices in a street; but the crib, who never thinks, is sure to pick out for his design some feature which is wholly indefensible. If he builds a porch, the most elaborate and delicately undercut jamb mouldings are introduced, and carved ornaments are put in within reach of every mischievous boy, which are soon obliterated or chipped off. His plinth mouldings are of the same kind, very full of deeply-cut members in a soft stone. He generally places a traceried window so near the ground or street level as to share the same fate. So easily have the facilities of reproduction lent themselves to the crib, it would be juster to say these facilities have made him. Before photography and the many photo-processes were known, these borrowers or stealers of other men's brains had fewer opportunities of copying. No one can tell what these very men could have done if they had been compelled to learn during their pupilage from such works as were open to them, when the temptations to copy were not what they are now. The cribbing instinct has begotten a distrust in their own resources; it has made real art very much harder to learn, because the crib is the last person to set before him any high standard of his profession. Nor is the habit of criticism particularly genial to the mind of the priggishly inclined; and all things con-



sidered; the use of the prig in the economy of art is to set stronger men thinking as to how they can escape from the trammels of mediocrity—that average of merit in architecture which shows us the real advance we have made.

#### ARE ARCHITECTS' FEES CONDITIONAL?

**T**HE remuneration of an architect is often, it would appear, made conditional on the acceptance of a tender for a certain amount. The client says, in effect, If you can guarantee that your plans can be carried out at a certain cost I do not object. This would be fair if the client acceded to the advice of his architect, and agreed, if necessary, to a certain curtailment of requirements. The arrangement would then be a reasonable one. But, as a rule, the employer requires a building of a certain size and accommodation, having a certain number of rooms, and it is here that the difficulty and misunderstanding arises. As a general rule, Mr. Brown wants a house or a shop of a certain description. He agrees that his architect shall prepare plans, which are ultimately agreed to. He says nothing about cost till after they are all finished. Tenders are submitted, and if they happen to be higher than he intends to expend, he often repudiates the undertaking altogether. There are numerous people of this class. They think that an architect's design is like any other commodity, and can be cast off at a moment's notice, if it is too expensive. We have repeatedly to report cases of this kind. An action remitted from the High Court, came before the Hanley County-court the other day, when a Newcastle architect claimed fees from a draper for services rendered. The defendant had given instructions to prepare plans for a house; quantities were also taken out by the plaintiff. For the former work the plaintiff was to receive a certain amount, and the usual charges for bills of quantities. The defendant had, it appears, stated a limit to the cost; but the architect said he could not guarantee to carry out all the defendant's wishes for the amount. The plans were ultimately prepared to meet the requirements of the defendant, and were approved by him. What more can an architect do than carry out the instructions? When the tenders came in the lowest was found to be a hundred pounds above the sum named, and on this ground it is alleged the defendant altered his mind, and declined to pay the plaintiff his fees. After hearing evidence, the verdict was for the plaintiff, with costs. It is not unusual for the client to back out of his contract on other grounds than those alleged. In this instance it appears the defendant sold the land, though he alleged the additional cost. In other instances the client has been found to change his mind, having seen some design he likes better. Whatever reason may induce him to alter his mind, the question of cost is a convenient one to make use of. As a matter of fact, very few designs for which tenders are sent in are found to be within the amount of the lowest. They are generally 20 to 30 per cent. above, and is it not quite unreasonable that because of this excess an architect's work should be considered useless and valueless? If such a principle were generally admitted, there would be very few clients who would not be entitled to abandon their undertakings, and refuse to pay their architect. It will be said with some justice clients of this sort are not worth working for: they are men who measure their professional adviser's skill and labour by their own low standard. No doubt there is an obligation on the architect's part to give his client a fairly approximate idea of the cost, but not to guarantee it, and to inform him, if his requirements are too great, of the fact, and how they may be reduced.

Beyond this he is certainly not called upon to go; he certainly is not responsible for the actual cost, and it appears both unprofessional and undesirable that he should bind himself to give any sort of guarantee as to the cost of carrying out his design. It is not the architect's business to accept all his client's conditions, to agree to carry out all his requirements, and to prepare designs to meet them at a certain cost, and when architects begin to understand the fact that they are not contractors, they will not so easily make any rash agreement as to the payment of their services being contingent on the result of tendering. Nor is it at all fair that a client should, after abandoning his intention of proceeding with the work, say, as he often does, that the plans and quantities are of no use to him. Many unprincipled employers imagine that they are relieved of their responsibility by saying the architect's labour is of no use to them; but recent decisions have wisely overruled this plea, by showing that the employer may have derived some benefit from the architect's labour. Indeed, if it were otherwise, we should often have people employing architects to obtain ideas, to see how their estates can be developed, and the cost of carrying out schemes, and then repudiating all liability for the fees earned, in this manner a manifest injustice would be done to the profession.

#### THE ARCHITECTURAL ASSOCIATION.

**T**HE fortnightly meeting of the Architectural Association was held on Friday evening, the President, Mr. W. D. Caroe, F.S.A., in the chair. Messrs. A. H. Goslett and C. J. Devitt were elected members.

The following classes would be commenced, the President announced, next month:—Sketching and masonry class, April 14; water-colour class, under Mr. Weedon, April 18; mensuration and land surveying, under Professor Henry Adams, April 22; and modern design, under Mr. H. Heathcote Statham, April 28.

#### NOMINATION OF OFFICERS.

Mr. BANISTER F. FLETCHER, hon. secretary, announced the "house list" of nominations for next session, leading off with the names of Mr. A. Beresford Pite as the member designated by the committee to fill the presidential chair, and Messrs. W. H. Seth-Smith and John Begg for the vice-presidencies. For the ten seats on the council eighteen members were nominated, and further names may be added to the list to be voted upon on the initiative of any two members up to and including Friday, April 24.

#### ARCHITECTURE OF THE TEUTONIC ORDER: WITH PARTICULAR REFERENCE TO THE MARIENBURG.

Mr. C. FITZROY DOLL read the following paper on this subject, illustrating his remarks by the exhibition on the walls of about seventy large mounted photographs and plans, and also some water-colours executed by Mr. R. Phené Spiers, F.S.A. (Two of the plans and four of the views are reproduced on our photographic pages this week.) Mr. Doll, having explained that he proposed to limit his remarks to the architecture of the Teutonic Order in Prussia, continued:—In order to obtain a grasp of the subject before us, it is necessary to know something of the history, rule, and organisation of the Military Order which ultimately had its chief seat in Prussia. "Equites. Teutonici hospitales, S. Mariæ Virginis, Hierosolymita," to give the Order its full title, can trace its origin back to 1127, when a German and his wife, resident in Jerusalem, turned their house into a "hospitium" for their compatriots, male and female, rich or poor, suffering from want or sickness. A faculty was obtained from the Patriarch of Jerusalem for the erection of a chapel for the use of the inmates, which was dedicated to the Blessed Virgin, and the establishment was thenceforth known as "The German Hospital of St. Mary at Jerusalem." The institution soon obtained large endowments from pilgrims to the Holy City, and pursued the even tenour of its ways until Jerusalem fell into the hands of Saladin, in 1187. The Sultan, with a characteristic generosity, allowed the hospital to remain. Two years later (1189), however, during the siege of Acre, the sphere of action of this benevolent establishment was transferred thither in order to

nurse the German sick and wounded, and soon afterwards Frederic, Duke of Swabia, determined to form an Order exclusively of his countrymen. The Teutonic Order as such was founded in 1190, under the walls of Acre. The knights took the usual vows of poverty, chastity, and obedience, and were required to live in community. Their habit was a white mantle with a black cross edged with silver. The Order was divided into four ranks—knights, priests, men-at-arms, and servitors, the last being called "Graumantler"—i.e., grey mantles, from the habit they wore. The men-at-arms were sometimes called "half-brothers," and were chiefly the vassals of the Order, and acted as infantry when in the field. The members were commonly called by their own countrymen "Marianer," which, I am afraid, if I translate as Mary Anners, I shall lay myself open to the charge of being frivolous, although there would be a singular appropriateness in the name, inasmuch as the church at the Marienburg is dedicated to St. Mary, and the chapel beneath it to St. Anne. The first Grand Master was Heinrich Waldbot von Bassenheim, a Rhineland from the neighbourhood of Coblenz. The second Grand Master was Otto von Carpen, a citizen of Bremen; the third, Hermann Barth, of Lübeck; and then, in 1210, Hermann von Salza, the greatest of all the Grand Masters, was elected. In 1229, Conrad, Duke of Masovia, who ruled over a portion of Poland, had fought with ill-success against the Prussians and Lithuanians, two heathen races, who were governed by a High Priest, under a constitution which their mythical hero, Waidewut, is said to have learnt from a hive of bees. After several defeats Conrad invited the Teutonic knights to help him in his war against the Prussians. Hermann von Salza seized this opportunity with alacrity. Von Salza obtained the sanction of both Emperor and Pope to the enterprise, with an Imperial Charter and Papal Bull complete. By the Charter the Order was generously given all the lands it might conquer, none of which, by the bye, belonged to the donor; but by the Bull (the Church ever being alive to its own interests) one-third of all the country annexed was to be given as endowments for bishoprics. At first Hermann von Salza only sent a few knights under Hermann Balck, who started by building a temporary stronghold at Nesselau on the Vistula, from which as a base he got possession of the holy oak at Thorn, and by degrees the whole of the left bank of the Vistula was acquired by the Order. Shortly after Balck obtained the whole of Pomesania, without fighting, and the town of Elbing was founded. In 1239, Hermann von Salza and Von Balck died, but the crusade was continued by Conrad of Thuringia and Otto of Brunswick, with the result that the provinces of Warmien, Natangen, and Barterland were added to the possessions of the Order. Whilst the conquest of Prussia was progressing the Order was growing, both in numbers and possessions, in other countries, more particularly in Sicily, Italy, Hungary, and Germany, which was the cause of the gradual development of a properly organised administration. The Grand Master, residing at Acre first and subsequently at Venice, was obliged to delegate his ordinary powers to deputies in the different countries where the Order held property. Each deputy bore a distinct title, which at once identified him with the country in which he was chief; thus the Grand Master was represented in Prussia by the provincial master (Landmeister). Each convent had a council to assist the commander in the performance of his duties, which doubtless was very necessary, as he seems to have had control in all matters appertaining to war, justice, commerce, cultivation, and colonisation within the limits of his jurisdiction. The general term for the buildings of the Order is castle; but for the particular names in respect to their rank I know no equivalents in our language, and so, with your permission, will call them Grand Mastery, Provincial Commandery, Grand Commandery, and Commandery. The victorious army of the Order swept along the watersheds of the Vistula and its tributaries, then along the coast of the Fresh Water Haven to the mouth of Pregel, up that river to Tapiau, thence crossing Samland to Labiau on the coast of the Curland Haven, and proceeding along the eastern shore to the delta of the Niemen and Nemel, went on to conquer Curland, Livonia, and Esthonia. As they pursued their course they formed temporary strongholds in desirable situations, protected by earthworks and timber palisades, the latter material ever being in abundance. On the sites of these



strongholds permanent buildings were erected at once in some cases, whereas in others a considerable time elapsed before the castle convent was constructed. A perusal of the table of dates given below (which is taken from Steinbrecht) will at once show when the temporary strongholds were formed and the permanent buildings erected:—

Formation of Stronghold.	Erection of Permanent Building.
1. Nassau ..... 1230	1. Althaus
2. Thorn ..... 1231	2. Culm ..... (cr. 1235)
3. Althaus Culm ..... 1232	2. Elbing ..... (1240-1250)
4. Reden ..... 1234	3. Balga ..... 1240-1250
5. Graudenz ... (1235)	4. Thorn ..... 1250-1260
6. Elbing ..... 1237	5. Neu Christburg ..... (1250)
7. Engelsburg ..... 1237	6. Graudenz ..... 1250-1260
8. Balga ..... 1239	7. Königsberg ..... 1257
9. Birgelaun ..... (1245)	8. Birgelaun ..... 1260-1270
10. Unislaw ..... (1245)	9. Unislaw ..... (1260-1270)
11. Neu Christburg ..... 1248	10. Brandenburg ..... 1266
12. Zantir ..... 1248	11. Lochstedt ..... 1270
13. Königsberg ..... 1255	12. Marienburg. 1280
14. Schöensee. (1250-1260)	13. Mewe ..... 1282
15. Roggenhausen ..... (1250-1260)	14. Tappian ..... 1280-1290
16. Papau ..... (1250-1260)	15. Papau ..... 1290-1290
17. Leipe ..... (1250-1260)	16. Schöensee. 1280-1290
18. Welsas ..... (1250-1260)	17. Roggenhausen ..... (1280-1290)
19. Marienburg. (1250-1260)	18. Engelsburg. (1280-1290)
20. Tappian ..... 1265	19. Reden ..... 1290-1300
21. Brandenburg ..... 1266	20. Strassburg ..... 1290-1300
22. Lochstedt ..... 1266	21. Leipe ..... (1290-1300)
23. Mewe ..... 1282	22. Golub ..... 1300
24. Strassburg ..... 1285	23. Welsas ..... ?
25. Golub ..... 1290-1300	25. Zantir ..... Never

Uncertain dates are in parentheses.

The permanent building was commenced by the erection of a tower, which was made perfectly habitable before any of the other buildings were commenced, so that it might serve as a tower of refuge in case of attack whilst the works were being carried on. These towers were afterwards incorporated with the castle—in some cases, within the main walls, as at Reden; in some, attached to the external walls, as at Strassburg; or, in others, detached entirely, as at Golub. In the last two cases, the only means of entry was a drawbridge on the level of the archers' gallery just under the eaves of the main building. A tower formed a part of most of the castles of the Order; but, although agreeing generally in essentials, no two are identical with regard to design—some being square or oblong on plan, whilst others are round or polygonal. The castle convents in general were square on plan, as nearly so as possible, the Mediaeval architects, as you are aware, having a rooted prejudice to exact dimensions. (A glance at the table of comparative dimensions of all the castles appended to this paper will at once demonstrate this assertion.) Thus Reden is 159' 1" on the north and south fronts and 157' 7" on the east and west. The Vorburg or outworks were built according to the natural contour of the site, and therefore were dictated rather by necessity than desire. They consisted of a large open space surrounded in many cases by a moat, and in all by an embattlement and loopholed wall, with a defending gallery behind it. There were flanking towers where necessity or policy demanded them. In the Vorburg were placed workshops, brewery, granary, stables, cattle-stalls, poultry-yard, vegetable garden, &c. The Commanderies in many cases had a large hostelry attached to them for the reception of visitors who had occasion to go to them on business or pleasure. Marienburg, on the right bank of the river Nogat, the branch of the Vistula forming the eastern side of the delta of that great stream, was erected by Conrad von Thierberg in 1280 (according to some authorities, in 1274) as a Commandery with a hostelry attached. The object of the castle was to protect the main road from Culm to the Haven district, and to be the seat of government of the lands with the delta. The original castle was planned for the accommodation of twelve knights with their men-at-arms and servants, and, as will be seen by the drawing [see illustration], the convent is nearly a square on plan, being 197ft. by 169ft., not to go into fractions. The plan follows the usual custom of ranging the buildings round a court-yard or garth, with cloisters on the ground floor, and cloister galleries over them to approach the rooms on the different floors. The basement was devoted to cellars, each of which had a rolling way to it, as shown on the ground-floor plan of Reden. Ample

cellarage was of great importance, as these castles, being open at any moment to attack, had to be ever prepared for a siege of unknown duration, and, therefore, the sufficiency of provisions was a matter of life and death. I fancy that when these stores were filled up with the comestibles our Teutonic brethren are so fond of, such as pickled and smoked fish and meat, pickled beans and cucumbers, sauerkraut and native cheese, you would not have required a setter or pointer to hunt up the position of the Commandery for you. The ground floor provided for the main entrance, the gatekeeper's lodge, the parlour, the kitchen (with its great brick and tile cooking-stove), the heating chamber, workshop, well, and offices, with accommodation for the servants. The first floor, as usual, is the principal one, and provides for the abode of the knights. In the north wing are the chapel, with sacristy, penitentiary cell, and a musicians' gallery (at the west end), the chapter hall, and muniment rooms. On the south side are the refectory and dormitory, and on the west the commander's, provost's, and treasurer's apartments. The east being the land side, and therefore most liable to attacks, was inclosed by a high loopholed screen-wall, with a loft, or fighting gallery, along its whole length. The archers' gallery went round the north, west, and south sides of the building, and was approached by the staircases shown in the thickness of the external walls. From this floor the Dansk, or Latrine tower was approached by a long passage carried on piers and arches, the intervening space between the main building and the tower being about 112ft. In no less than eleven out of the twenty-four castles erected by the Order in Prussia proper, there is a Dansk entirely detached from the main buildings with a passage to it on a permanent bridge, a promise of the future development of sanitary science in that land which has not been realised to this day. In the roofs were large lofts for storing grain and other requisites. The hostelry, Mittelschloss, had on the north side the infirmary, on the east the guests' chambers, and on the west the workshops and stables. Such was the Commandery when, in 1309, the Grand Master Siegfried von Feuchtwagen, determined to transfer his residence from Venice to Marienburg. At first the buildings were probably large enough to house the Grand Master, with his officers, knights, and retinue; but soon the Order attained to such power and wealth that their concomitants, state, and luxury demanded space in the Marienburg. The succeeding Grand Masters, Werner von Orselin (1324-1330) and Luther of Brunswick (1331-1335), altered and added to the Hochschloss, founded the Grand Master's chapel of St. Anne, and adapted a part of the hostelry to the more pretentious requirements of the Grand Master. Dietrich von Altenburg (1335-1341) completed the church, built in its present form the main tower, formed the Vorburg (outworks) and surrounded them and also the town of Marienburg (which originally was called Allyem) with walls and towers. During the Grand Mastership of Winrich von Kniprode (1352-1383) the great image of the Virgin and Child was set up in the external niche, at the extreme east end of the church, and the Grand Master's palace was built. The demolition of the stables and workshops in the hostelry (Mittelschloss) to make room for the palace necessitated the erection of further buildings in the Vorburg to supply their place. The plan made by Reg. Baumeister Felten in 1893 (reproduced herewith) shows all the Mediaeval work extant at that date. The defeat of the Grand Master's forces at the battle of Tannenberg in 1410 was the beginning of the end of the power of the Order; but the Marienburg continued to be the Grand Master's residence until 1468, when it fell into the hands of the Poles, and thenceforth for three centuries was a royal palace of the Polish kings, during which period the castle suffered a great deal from the effects of the ever-recurring wars between the Poles and Swedes, as well as neglect. In 1772 West Prussia was ceded to Frederick the Great, which did not improve the condition of the Marienburg, as the Grand Master's palace was used as a weaving-mill, and the Hochschloss as barracks. Thirty years later the Prussian Government started to adapt the buildings for the purpose of a magazine of war material, and had done irreparable injury to the east wing of the hostelry, when the cry raised by the poet Schenkenendorf put a stop to such vandalism. In 1815 the president of the province, Von Schön, had the restoration of the

Grand Master's Palace taken in hand, and later, in 1850, the restoration of the Hochschloss was commenced under the guidance of the architects Von Quast, Voight, and Gersdorff, in the order named, and is now being carried on to a happy completion under the enthusiastic care of Baurath C. Steinbrecht. And now for a stroll through the "Alhambra of the North," as the Germans fondly call it, in its present condition. Upon crossing the drawbridge over the outer moat we pass through the portal into the courtyard of the Mittelschloss. On the left are the guest chambers of the hostelry and the office of the Grand Commandery, still in the form of a magazine. To the right is the infirmary on the right side, and on the west side is the Grand Master's palace. We pass the covered well and enter on the ground level the knight's hall, in which the Grand Master entertained his guests. The hall is about 92ft. by 43ft., the beautiful 14th-century brick vaulting over which is carried by three octagonal granite shafts with limestone bases and caps. It is lighted by eight two-light windows on the west and seven on the east, all having tracery heads. These are unfortunately filled with modern stained glass of very inferior quality. Under the distemper on the walls the remains of frescoes have been discovered, representing incidents in the history of the Order, which Professor Sharper, of Hanover, is using as an index for the future decoration. The hall was heated by means of a large earthenware stove, from which flues were formed under the floor, as indicated by the earthenware movable discs in the pavement by which the hot air could be let into the apartment. To the north of the hall is the kitchen, with a large brick and tile stove, and in the division wall between the hall and kitchen is a serving hatch. Beneath both these spaces are brick-vaulted cellars. The springing of one of these vaults, which is under a shaft in the hall above, is very interesting. Returning into the courtyard, we pass through the watchroom to the main staircase, up which, on the first floor, we reach the Grand Master's apartments. Going along the beautiful vaulted gallery (see illustration), lighted towards the north by four tracery windows, and to the west by one, and having the vaulting carried on one side by octagonal shafts partly granite and partly limestone, we come to the Master's summer hall, which is about 42ft. square, and the most beautiful apartment in the palace. The brick vaulting springs from a single granite shaft with limestone moulded cap and base. There are ten two-light square-headed windows to this apartment, having tracery in them. The stained glass is more interesting in respect to the subjects than to the quality. They represent events in the history of the Order, amongst them being one to commemorate the reception of the Earl of Derby, afterwards Henry IV. of England, by the Grand Master Konrad von Wallenrode in 1392, at the Marienburg. Henry had gone over in 1390 with 300 English archers to assist the Order against the Lithuanians, and the chronicler Johann von Posilge speaks with astonishment of the havoc the English bowmen wrought in the ranks of the enemy. Anything more beautiful than this chamber, both with regard to proportion and dignity, it is difficult to imagine. Formerly, the hall was decorated with colour, of which sufficient has been found under the whitewash to indicate the course to be pursued in the restoration. To the east of the summer hall is the winter hall of the Grand Master, which measures about 35ft. by 37ft., and is designed in the same way as the former, with the vaulting centring on a single granite octagonal shaft with limestone base and springer, there being no cap. It is lighted by four traceried square-headed windows, and heated by a large earthenware stove with flues under the floor, as previously described. On the walls the remains of the full-length portraits of the Grand Masters have been found, but they are not distinguishable upon the photograph. Adjoining the last apartment is the Master's parlour and his private room, the latter of which has the vaulting centred on two octagonal granite shafts having limestone bases and caps. The position of this room gave the Master a view over the courtyard of the Mittelschloss, including the bridge into the Hochschloss. Crossing the gallery first mentioned at its eastern end, we come to a vestibule from which the house chapel is entered, which is about 32ft. by 17ft. This chapel is emphasised externally by projecting in front of the general line, and having a triple gable over



it surmounted by a cross. Next to the chapel is the Grand Master's sleeping apartment, with attendant's and bath room adjoining, as well as a strong room. On the north of the Grand Master's bedroom is the armoury, from the east end of which a staircase in the wall leads down to the knights' hall. In an ambury in the armoury there are several pieces of Mediaeval plate belonging to the Order, including a beautiful 13th-century silver chalice and a "Field Altar," which was carried with the knights when campaigning, to be used at religious functions in the field. Before leaving the Grand Master's apartments, I wish to call attention to the ingenuity with which the servants' stairs from the basement are planned, and the hidden passages leading to the serving hatches in the summer and winter halls. The difference of level between the river front and that of the courtyard is so great that another floor is obtained on the Nogat side under the Grand Master's apartments. These were probably occupied by the Grand Officers. The rooms immediately under the summer and winter halls. The elevations towards the courtyard and Nogat proclaim the history of the Order by a combination of Saracenic with Venetian and German Gothic, whilst the predominant vertical lines symbolize the Christian, and the general massiveness with the embattlemented parapet the military, aims of the Order. Considering the poverty of the material at the architect's command, I think that he has invested his design with great dignity, and succeeded in a high degree to give it that architectural character which at once proclaims to the beholder the purposes for which the building was erected. Crossing the drawbridge at the south-east corner of the Master's palace, we enter the Hochschloss, or convent house. I have already described the arrangement of the plan when the Marienburg was a Commandery; it will therefore only be necessary for me to point out the alterations made by the successive Grand Masters. The solid black on the walls indicates the portion of the old Commandery incorporated with the existing building. The double cross-hatched parts show the alterations and additions that were made between 1300 and 1335, which comprised the pulling down of and rebuilding the walls of the south and east wings next the courtyard, the addition of an extra story to the east, south, west, and part of the north wing, with the alteration of the first floor consequent thereon, the building of the south wall of the new main tower up to the roof, and the almost entire reconstruction of the cloisters and cloister galleries, also the enlargement of the chapter hall. The single hatched portions of the plan indicate the additions made from 1335 to 1344, and include the building of the chapel of St. Anne and the enlargement of the church. All the parts that are dotted on the plans show where those precious materials (in that country) stone and granite are used. On the ground floor the alterations had no further effects on the plan than the completion of the cloisters, as the chapel of St. Anne was built without disturbing the main wall. The three tombs in front of the altar are those of three Grand Masters. As this chapel was built over the whole of the available space between the castle and moat, it became necessary to have a path through it, hence the doors on the north and south opposite one another. The carved stucco in the north porch is most remarkable. On the first floor considerable alterations were made. The cloister galleries were rebuilt [to the design shown by our illustration]. The chapter hall was enlarged by adding the former muniment room to it. The brick vaulting is carried by three granite shafts in the centre, having Esthonian marble caps and corbels, also of the latter material, upon which are represented very quaintly (by carving) the virtues of the Order. The bosses are of carved clay burnt, some being covered with tracery, whilst others represent the pious deeds of the brotherhood. The windows are filled with stained glass, having the armorial bearings of the Grand Masters in the designs. Professor Sharper is carefully restoring the full-length portraits of the twenty-three Grand Masters from Heinrich Waldbot to Conrad von Erlichhausen found on the walls. The extension of the church towards the east was executed, as also the existing vaulting, during the Mastership of Dietrich von Altenburg (1335-1341). The church is entered from the cloister gallery by the renowned "Golden Portal," built in 1280, of which I have three charming drawings made by Mr. R. Phené Spiers. The carved figures and enrichments are executed in clay burnt, and

were originally gilded, hence the name. The interior is 130ft. long, 30ft. 6in. wide, and about 57ft. high, and is lighted by eight windows at the east end and two in the north side, filled with stained glass, of which part is original. The super-altar is a fine specimen of wood-carving. The stalls, rood, with side figures of St. Mary and St. John, and the candelabrum are the Mediaeval ones, and have been most conscientiously restored. The choir gallery at the west end, with a niche above for a small organ, is very beautiful as well as interesting, being a part of the church of the Commandery. The whole of the colour decorations have been discovered under the distemper. The frieze running all round the church represents in Biblical and legendary form the history of the Christian Church from the Promise of Salvation to the Last Judgment. The next alteration on this floor was to turn the former fighting gallery of the Commandery into a dormitory, and the former refectory into a day-room, or Domus Conversorum. [See illustration of the refectory as restored.] The officers' apartments on the west side remained very much the same as they were. The cloister gallery is carried one story higher on the south side of the courtyard than on the others, to give access to the refectory and frater. The former has the brick vaulting centred on seven granite octagonal shafts with stone caps and bases. It is 93ft. 6in. long and 29ft. 6in. wide, and is lighted by seven windows. In the gallery adjoining is the lavatory, and in the wall between the gallery and the refectory are serving-hatches. The frater is the most complete apartment in the building, and has the brick vaulting centred on three granite shafts, with stone caps and bases. The decorations have been executed to accord with the remains of the original scheme of colour. The knights tilting and the effigy of the Grand Master carved in stucco on the north wall are worthy of remark, especially by the way in which the one knight, regardless of trifles, passes his lance through the springing of the vault, and yet pegs his man. The frater has a charming pipers' gallery, which is approached by a stair from the corridor without. The three staircases, one from the church and the others from the chapter hall and frater respectively, lead to the archers' gallery, which runs all round the building. Round the building, between it and the moat, is the "Parham," which I can only translate as "park" or "terrace." On this terrace, to the south of St. Anne's Chapel, was the place of sepulture of the brethren. Our illustrations show the exterior of the Hochschloss and Mittelschloss from different points of view, with the works connected with them. Two of them represent a part of the north front of the Mittelschloss, the coloured drawing being by Mr. R. Phené Spiers. The most noteworthy features in these are the now detached tower, which was originally the dansk of the infirmary, and the carved stucco in the gable and the embattlements. Of particular interest is No. 65, which shows the east end of the church with the colossal figure of the Madonna and Child in a niche. This figure, which is 28ft. high, is formed with a core of brick covered with stucco, in which the figures are carved. It is then covered with glass mosaic, the predominant colour being gold. When the morning sun is upon the figure, it is visible for miles over the plains. With regard to the material that was chiefly used in the erection of the buildings of the Order in Prussia, I have a few samples to show you which Baurath Steinbrecht has kindly sent me:—No. 1 is a cusp of grey stucco from one of the 14th-century windows. Stone having to be brought for hundreds of miles made it so expensive that a substitute had to be found, and such is the invention that necessity was the mother of. I have seen it in a splendid condition in tracery heads, whilst the stone mullions supporting it have quite perished. The material was made in blocks, and when perfectly dry carved like stone. When the mass has powdered carbon mixed with it, they call it grey stucco (Graustuck); when mixed with ground tile or brick, red stucco (Rothstuck). No. 2 is a moulded brick taken from a rib of the vaulting over the chapter hall in the Hochschloss. This brick weighs 8lb., and after immersion in water for 24 hours absorbed 15½oz. No. 3 is a piece of a limestone base. This stone is used for the capitals and bases of the shafts—in fact, wherever great weight had to be carried or wear withstood. In the 13th century this stone was imported from Esthonia; but in the 14th and 15th centuries from the Island of Gothland. No. 4 is a piece of

a small round granite mullion shaft from the cloisters. This granite is found, in large rough blocks buried in the earth, in Prussia, which are called "Granit Findling" or granite foundlings. No. 5 is a glazed tile taken from the ground floor of the Hochschloss. No. 6 is an ordinary moulded brick taken from the Mittelschloss. It measures 12in. by 5½in. by 3½in., and weighs 13lb. 6oz., this weight being increased 1lb. 11½oz. after soaking in water for 24 hours. With but slight variation, the Mediaeval bricks found in all these castles are of the dimensions given above. No. 7—this is a glazed brick crocket, taken from a gable of the church. No. 8 is a piece of the Mediaeval brickwork, which shows the quality of the mortar. The lime is chalk lime, and is called in Prussia "Lesekalk," or "gathered lime," from the fact that the chalk is found in small pieces on the land, and also beneath the surface, where it was deposited like the granite by some great revolution in Nature in ages past. I must not omit to mention the glazed bricks and roofing tiles, which fill one with astonishment at the knowledge of chemical technology possessed by the brick manufacturers of the period when these buildings were erected. The glazes are transparent and lustrous to a high degree and the colours most varied, and, being on the common brick, are much more effective than our modern ones with their evenly pressed surfaces and semi-opaque glazing. One more item worthy of remark is what I have advisedly called "carved clay burnt," because that describes correctly the beautiful examples of terracotta that are to be seen in North Germany. The mode of its production was this: The Mediaeval workman took a lump of carefully-prepared clay and roughly boated it to the shape he required, and then let it dry. Just before it was absolutely dry he carved the design upon it with iron carving tools, and when perfectly dry it was put in the kiln. The consequence is that the piece comes out of the kiln with a perfect skin, which makes it practically imperishable. The figures of the five Wise and five Foolish Virgins, with the other enrichments of the Golden Porch, as well as the bosses and corbels above referred to, were made in this way, which accounts for their good state of preservation. The brickwork is executed in both what we call "Flemish" and "English" bond, with good thick mortar joints. Having scratched the surface of this immense subject, I hope that some of the younger members of the profession may be induced to take their holiday in Northern Germany and delve deeper into the mine of architectural wealth existing in the Baltic Provinces. If they do not find what they have been taught to consider the "absolutely beautiful," they certainly will find the picturesque, and will assuredly get lessons in construction and effect with such a poor medium as brick not to be obtained elsewhere. In the Hanse towns and those founded by the Teutonic Order, such as Lübeck, Ratzeburg, Schwerin, Wismar, Rostock, Stralsund, Neu Brandenburg, Stendal, Stargard, Dantz, Königsberg, Thorn, and many others, there are brick ecclesiastical and domestic buildings of noble dimensions and proportions of the utmost interest to us, of which little is known or cared about by our countrymen. This is a pity, for I am sure that if the new style we yearn for is to be discovered by us at all, it must be developed by the natural Teutonic genius that in us lies. We cannot get it from the Latin genius, however much we may admire its productions—it is not ours. I know this is heresy; but until our professors and authors cease in their endeavours to teach the thrush the nightingale's song, we shall make but poor progress. It only remains for me to give my best thanks to Mr. R. Phené Spiers for the loan of his drawings, and Herr Baurath C. Steinbrecht for the drawings, photographs, materials, and information he has placed at my command.

Mr. R. PHENÉ SPIERS, F.S.A., in proposing a vote of thanks to the lecturer, remarked that it was more than thirty years since, when commencing a long tour to the East as an Academy Travelling Student, he visited Marienburg, and made the water-colour sketches and drawings on the wall. The quiet village was then extremely picturesque, and even the iron bridge carried on stone piers was a satisfactory structure. The chapel still possessed many features of historic interest, and he trusted that it would be restored as little as possible, and, above all, that the walls would remain unscraped. The builders of this fine group of edifices had very poor constructional materials to work with, but employed them well.



TABLE OF CASTLE BUILDINGS, AT THE END OF THE 13TH CENTURY, IN THE ORDER OF THEIR IMPORTANCE, WITH COMPARISON OF MEASUREMENTS.

		Space inclosed by Fortifications. Square feet.	(Vorbürgen.) Outworks and Position.	Convent Castle.			Court-yard.		Chapel.		Chapter hall.		Refectory.		Dormitory.		Officers' special Apartments. Number of Rooms.	Chief Tower. Form and Position.	Latrine Building. Form and Position.	
				Length.	Breadth.	Area.	Length.	Breadth.	Length.	Breadth.	Length.	Breadth.	Length.	Breadth.	Length.	Breadth.				
CULM	Grand Com- manderies.	226,383	Three, covering one side of the castle.	(164)	(164)	(8,202)	...	...	...	...	...	...	...	...	...	...	...	...	...	
ELBING		(137,798)	One ditto, ditto.	...	...	...	...	...	...	...	...	...	...	...	...	...	Palace in the outworks (as described).	...	Tower in the out-works (as de-scribed).	
BALGA		114,832	Surrounding three sides of the castle.	184	r. 144	8,071	99	r. 66	...	(30)	(59)	(30)	...	...	...	...	Two sets in the outworks, each having three rooms.	...	Tower according to chronicles.	
KONIGSBERG		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	As described in chronicles.	
NASSAU		(52,495)	In front of one side.	(164)	(164)	(8,202)	...	...	...	...	...	...	...	...	...	...	...	...	At the angle.	Tower and passage existing.
THORN		98,428	Five Vorbürgen surrounding three sides.	(164)	(131)	(6,562)	...	...	...	...	...	26	...	...	...	...	...	...	...	...
GRAUDENTZ		22,967	In front of one side.	(164)	(131)	(6,562)	...	...	...	...	...	...	...	...	...	...	...	...	Round at angle, and detached. Over the gate!	Broad oriel and passage.
ROGGENHAUSEN.		196,855	Ditto, ditto.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
REDEN		93,506	Ditto, ditto.	172	170	8,957	74	74	75	29	47	28	61	30	59	28	One set of three rooms.	Octagonal at the corner.	Broad oriel and passage.	
STRASBURG		68,899	Surrounding two sides.	151	148	6,808	78	62	(73)	(29)	...	...	...	...	...	...	...	Octagonal at the corner, partly attached.	The beginning of passage only existing.	
CHRISTBURG	Commanderies of the second class.	82,023	In front of one side.	199	170	10,275	108	88	65	33	61	32	59	29	(52)	(29)	Two sets of three rooms.	(?)	Three towers and passages.	
MARIENBURG		67,587	Entirely surround-ing castle.	155	153	7,205	75	62	58	25	59	25	...	...	...	...	...	Pentagonal tower on the corner.	...	
BRANDENBURG.		57,416	In front of one side.	215	170	11,155	125	84	(66)	(27)	(?)	(28)	(66)	(27)	...	...	One set of three rooms.	Ditto ditto (?).	Passage and tower (as described).	
LOCHSTEDT		39,371	Ditto, ditto.	176	156	8,734	99	76	52	25	...	...	53	25	...	...	Two sets of three rooms each.	...	In the outworks (as described).	
TAPIAU		...	Ditto, ditto.	157	151	7,244	78	69	...	...	...	...	...	...	...	...	...	...	...	
BIRGELAU		39,371	In front of one side	164	154	6,562	109	99	...	...	44	25	46	25	...	...	...	...	...	
UNISLAW		59,056	Surrounding two sides.	132	132	5,328	58	58	47	24	46	23	58	23	...	...	...	...	...	
PAPAU		42,652	In front of one side	128	125	4,862	62	59	...	...	...	...	...	...	...	...	...	...	...	
LEIPE		52,495	Two Vorbürgen with one forecourt in front of one side.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	The piers of the passage existing.	
SCHONSEE		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
GOLUB	Commanderies of the third class.	42,652	One Vorbürg in front of one side.	138	129	5,456	74	58	48	23	47	23	48	19	...	...	One set of three rooms.	Round at angle and detached.	...	
ENGELSBURG		82,023	Two Vorbürgen in front of one side.	...	...	(5,250)	...	...	(58)	(26)	...	...	...	...	...	...	...	...	...	
WELSAS		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
ZANTIR		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

It was probable that the square-headed treatment of the windows and other details were derived from Venice.

Mr. A. H. HART, who seconded the vote of thanks, observed that the illustrations showed many details which, although interesting, they could neither admire nor wish to repeat.

In reply to the vote of thanks, which was heartily accorded, Mr. DOLL claimed that in his restoration of the Marienburg the architect would delight the heart of Mr. Thackeray Turner, so careful was he not to injure the effect of the building. Every new brick introduced during its restoration could be traced, and the old work had not been scraped down. In the interior the whitewash was being removed from the vaulting, revealing the ribs and joints of the brickwork. The architect was unable to get stained glass for the windows of the quality and design he desired from German makers, and proposed to obtain designs from England, rightly regarding the kaleidoscopic character of German painted glass as dreadful. He could not understand how the occurrence of hair-cracks was avoided in the clay which was carved before being burnt, either in old or modern German work, unless it was due to the careful mixture of different clays. In that now used some 50 or 60 qualities of clay were combined, including kaolin from Cornwall, and other materials from Prussia and Norway. Very often in England terracotta was prepared with too little care and a want of chemical knowledge of the constituents. Much of the modern German architecture was, to his mind, beneath criticism, and he attributed it to the architects' absurd admiration for everything of Latin origin.

#### ARCHITECTURAL ASSOCIATION VISIT.

THE members of the Architectural Association paid visits on Saturday afternoon to two buildings on the Chelsea Embankment. The visitors assembled at the British Institute of Preventive Medicine, now in course of erection from the designs of Messrs. Alfred Waterhouse and Sons, at the corner of the Embankment and Chelsea Bridge-road. The party was received by Mr. Thomas Higgin, the clerk of works, who exhibited the plans, and conducted the members

over the building. The premises will consist of six floors, including a basement, and covers an area of 80ft. by 60ft., space being reserved for an extension at the northern end. The walls are faced with Raubon red bricks, Ham Hill stone being employed for dressings. The rooms are arranged as bacteriological, physical, and chemical laboratories, a lofty lecture theatre, 40ft. by 20ft., being provided on the top floor. Considerable difficulty was experienced with the foundations, and therefore brick piers about 6ft. square were sunk at short intervals to a depth of 10ft. The intervening earth was then lowered, and a thick bed of concrete laid over the entire site. The work has been carried out in two contracts; that for foundations was taken by Messrs. Mundy and Co., at between £6,000 and £7,000, and the present one, for about £17,000, is being carried out by Messrs. D. Charteris and Co., of Westminster. The work is just below cornice level at present.

The visitors then proceeded to Chelsea Embankment Court, a crescent of twenty-three town houses, just completed on the site of the late Naval Exhibition, and illustrated by plans and general perspectives in our issue of September 27, last year. They were received in one of the houses by the architect of the group, Mr. Delissa Joseph, F.R.I.B.A., who read a short descriptive paper. The buildings have a frontage of 280ft., and thirteen distinct designs have been distributed over the block arranged on five types of planning. The keynote of the arrangement is to be found in the treatment of the halls, staircases, and landings, while the internal joinery of each house was largely varied. The fronts are of red bricks, with white stone ornamentations and dressings, and the backs are of red bricks. The contract was taken at £92,000 by Messrs. J. Allen and Sons, of Kilburn, Mr. W. J. Otterwell being the chief foreman.

#### THE TECHNICAL EDUCATION BOARD EXHIBITION.

THE competition for the art scholarships and exhibitions promoted by the Technical Education Board of the London County Council is a laudable endeavour to encourage the application of art to various trades and industries. The

works exhibited at Bolt-court last week, which have been executed by young men and women competing for the above scholarships, are promising, and show how, under proper instruction, the art instincts of those employed in trade can be encouraged and directed. The Board have judiciously been guided in their selection of these works by their art advisers, Mr. George Frampton, A.R.A., and Mr. Lethaby, who have done wisely to set aside the mere results of examination, and rely chiefly on the merits of the works themselves. The conditions under which these art scholarships and exhibitions have been competed for appeared some months ago. The Board, we believe, agreed to award 100 evening art exhibitions, and not more than 20 art scholarships, and the same number of schools of art scholarship. The candidates were required to be resident within the County of London. Students of the various Metropolitan art schools have been thus encouraged to design and execute works personally, without reference to school work, and the application of skill and good taste to every-day work has been the result.

The specimens on view comprise modelling, cabinet-making embroidery, drawing from the cast, ornament, and the human figure. The examples of modelling show a right direction and spirit, as in the friezes and panels in low relief. We notice a well-designed voluted bracket with figure, by J. E. Tuckett, that shows boldness of conception. Fritz L. Roselieb, of the City Guilds, exhibits a lectern with clustered shafts and moulded base. Another specimen is for a bronze door-knocker, modelled in wax, chaste in design (Italian Renaissance), and spirited in execution, by F. A. Wright, who also shows a modelled statuette from the nude displaying vigour and life. The design for an electric lamp, by F. W. Gillman, has some merit; there are five branch lamps springing from a standard, the base of which shows vigour and freshness in the introduction of winged lions round the base. Still, the design as a whole is not quite satisfactory. We especially notice with commendation Edith Augusta Wright's design in *gesso* for a book-cover, in which the student has truly grasped the idea of a cover for a book on natural history. The low-relief ornament consists of a spirited introduction of aquatic plants, shells, and fishes in the centre and border, arranged with much



unconventional freshness. The relief is in two tones of gold and copper. A few wood carved panels are worth notice for their sensible flat treatment of foliage. An inlaid panel on walnut, with a quaint figure design inlaid in coloured woods, is very creditable, and we must notice also a model of a wardrobe in walnut, an original study, and one or two decorative (painted) panels by E. Bishonden, of the City and Guilds School, which evince a decorative spirit in the design and colour. A large stencilled frieze of scrollwork and foliage with squirrels is better in motive than colour. The reliefs or sculptures in silvered bronze at the end of room exhibit unquestionable life, action, and grace of line: they are sketchy and suggestive, and bear promise of ability in this direction. Even the "artistic poster" has not been forgotten. One of these represents a design for a poster for a promenade concert, and shows a cleverly-drawn arrangement of figures in two or three colours, perhaps a trifle too pictorial in motive. The three-hour figure studies are not without interest, if we take the works of Benjamin Nelson, Eleanor Brown, and other drawings of studies in relief. A model of a boy, in Italian walnut, by R. Price, a brass finisher, is well modelled. Several designs for book illustrations are not devoid of merit. Ethel Burgess has a clever illustration of nursery rhymes in pen and ink; and a sketch in colour, entitled "Gossips" deserves notice, in addition to a few other illustrations. A clever ink-drawing illustrating St. John the Evangelist, Red Lion-square, Sunday-school, displays considerable invention. The studies of embroidery, designs for chintz, &c., include a few essays in which the motives of pattern and colour are excellent. A fire-screen embroidered in colour and gold, on a black ground, is effective. We only noticed two or three examples of cabinet-making; one a model for dining-room table, in which the table-top corners are canted off, and the edge is moulded; the legs are square, with sunken mouldings, instead of the ordinary commonplace turned supports, the other is a small card-table; in both there is a right perception of simplicity and honest treatment of the material. We believe these exhibitions of skill, which the Board have instituted, will prove successful, and they are anxious that the competition will become known to a wider class. The examinations for the Board's evening art exhibitions, artisan, and schools of art scholarships, have been held, and arrangements have been made by which works submitted for competition can be entered for the national competition at South Kensington next month.

#### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XIV.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE subject of this chapter is the description of two classes of buildings erected for one purpose, and most frequently, especially in London, adapted for concert-halls and places of



FIG. 1.

varied entertainment. I refer to the vestry hall, as distinct from the town hall, and the swimming-bath.

The vestry hall class is represented by the Penge Vestry Hall, of which Mr. Elphinstone is the architect, and the swimming-bath by the

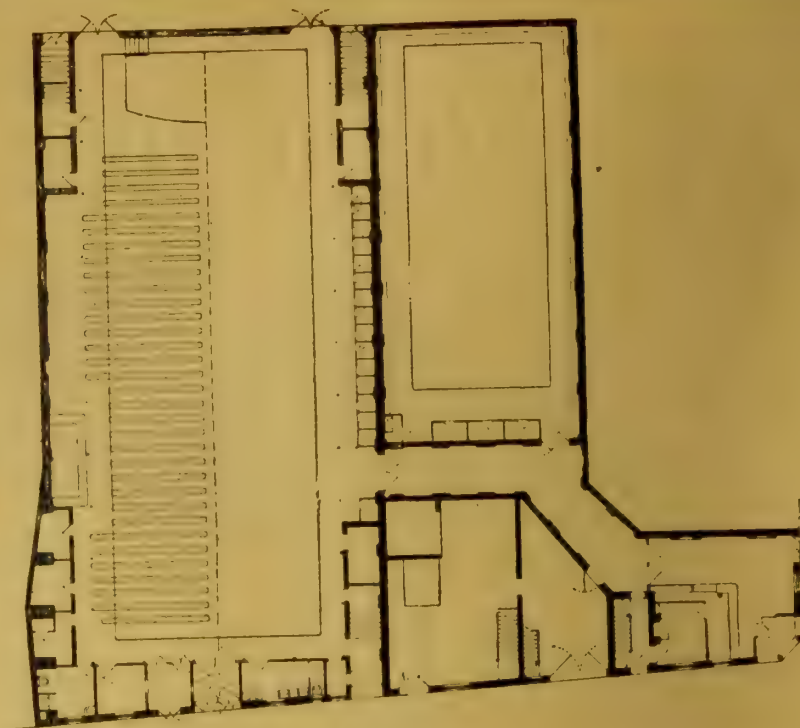


FIG. 5.

Excelsior Swimming Baths, Bethnal Green, which have been converted into a place of public entertainment by Mr. Walter Emden. I have to thank these architects for their kindness in supplying me with their plans and every information required for my article.

Taking first the Penge Vestry Hall, we find by the plans we have a small hall measuring some 57ft. by 27ft. wide, or a length of nearly twice the width, and this room is connected with the rooms of the vestry officials, the main entrance to the hall being the same as that to the offices. There is, however, a separate entrance to the hall, as well as an additional exit.

Formerly there was only a platform in the room; but as a stage play license was required, the back wall was pierced and formed into a proscenium wall, and a regular stage was erected

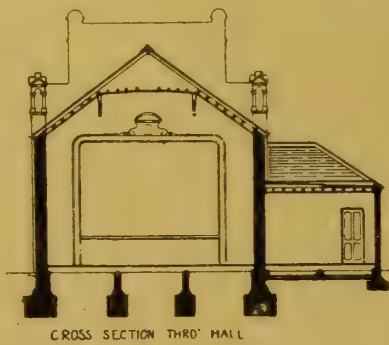


FIG. 2.

beyond suitable for dramatic performances, and complying with the regulations of the L.C.C. in detail. The sections, Figs. 2, 3, 4, show how this alteration was carried out, and how the required height of twice the proscenium opening was obtained by carrying the roof of the stage above the roof of the hall.

There is an asbestos fireproof curtain dividing the stage from the hall, and this is one of the very few instances in London where an assembly-hall has been fitted with such a curtain.

When these premises are used at night the vestry offices, Fig. 1, are vacated and used as retiring, tea, or cloak-rooms, as may be required by those using the hall. The ante-room at the side of the hall affords a space for serving light refreshments when dances are held.

This example of a small vestry hall must not be regarded in the same light or compared with the large town halls which exist both at home and abroad. Their arrangements are very different,

and far more important. The plans which we now have are only suitable for a small vestry hall in a country town or suburb. In cases of town halls, it will be seen, when we come to discuss that

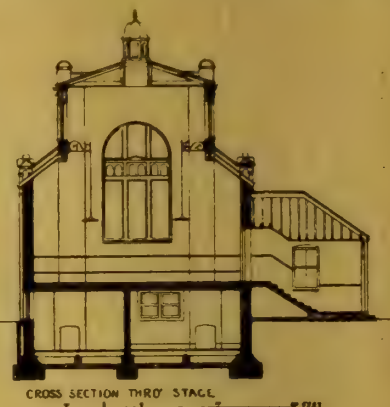


FIG. 3.

part of our subject, that it is essential to separate the part given up to public entertainment from the part used by the town officials.

The swimming-bath lends itself most readily as

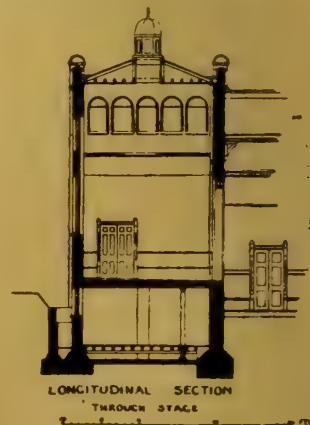


FIG. 4.

a place for concerts and assemblies. The very shape of the room is, as a rule, a good one; but the entrances and exits are usually very bad indeed. When one considers that for half the



year a building erected for a swimming-bath lies idle, and when one sees how easily it can be converted into a public hall, where due consideration is given to that fact in the original designs, then one wonders how it is that swimming-baths are built with such bad entrances and exits. Where a bath can be altered or is built originally so as to meet the requirements of the Theatres Committee of the L.C.C., if it has a music license, the building earns a revenue by sub-letting for entertainments during the winter months.

The subject of the illustrations Figs. 5 and 6, as I have said, is the Excelsior Swimming Baths, Bethnal Green, which Mr. Walter Emden, has very cleverly altered so as to be a hall of entertainment, which may well be held up as an example to many other places of public resort in London when one looks at the number and the position of the exits the architect has provided in the building alike to ground floor and gallery.

The plan shows the ground floor of the big bath—one half as a swimming-bath, and one half how it appears when the tank is floored over, and the hall seated as a public assembly-room. It will be noticed that all the wooden partitions

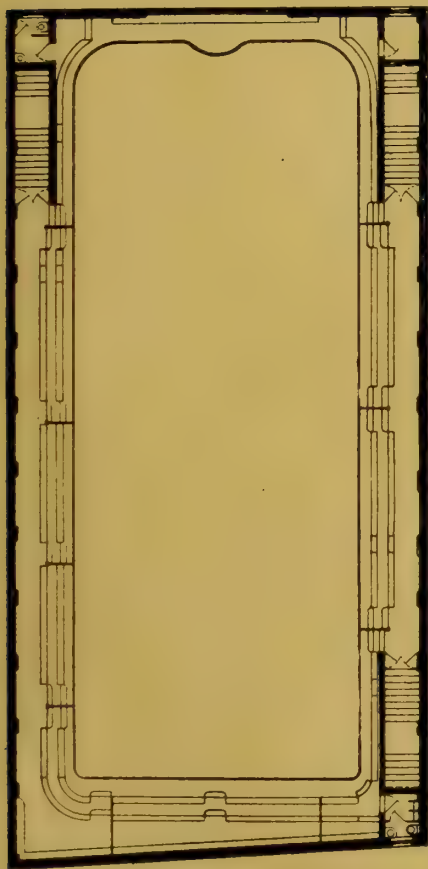


FIG. 6.

forming the dressing-boxes of the bath are removed when it becomes a hall, and this is done by an ingenious contrivance of hinges and thumb-screws.

The smaller swimming-bath is not used as a concert-room, but the passage into which it leads affords an additional and wide exit from the large bath.

These two examples give a very good idea of the adaptability and convertibility of buildings erected for one purpose being used for another under peculiar circumstances. In the first instance the building is used for its legitimate purposes in the daytime, but, by the skill of its architect, it has been converted and changed in its arrangements so as to be suitable at night for balls, concerts, and dramatic entertainments.

In the second case, the original intent of the building was for a swimming-bath for summer use; but after Mr. Emden's alterations were made, the proprietors were furnished with a hall most admirably adapted for such entertainments as delight the inhabitants of the district.

It is not always a safe or wise thing to try and change or convert a building into a place of public resort; too frequently the result is far from satisfactory—is, indeed, very bad and even dangerous.

It is also often foolish to use a building for two purposes, as the one usage may add to the danger of the other. By this I mean that what is carried on in the building in the daytime may leave a risk of an outbreak of fire at night when the public are assembled; or the business of the day may obstruct the exits and passages at night. It is only, therefore, a very limited number of buildings of this class which may with safety be employed at night for entertainments.

But of this limited number much more could be made than at present is the case, if the architects, when designing their buildings, would consider the importance of their clients letting them out for assemblies of various kinds, and the exits, staircases, &c., then needed to meet the requirements of the regulations. Whatever a hall is originally built for, good exits are always a great addition to its value and usefulness.

There is a tendency to have all rooms, or halls, where music and dancing takes place, under the control of the licensing body, and when the license is applied for, the applicant finds himself presented with a list of structural alterations, which must be carried out before he can obtain a certificate of the Council's architect. The applicant in many cases looks upon this as a hardship; he is not so much to blame as the architect who originally and foolishly designed his building without looking ahead into the future. We have seen two examples of how alterations can be made so as to get a satisfactory result; but there are exceptional cases, and architects should not satisfy themselves with the idea that when a license is needed then alterations can be made. This is only putting his client to unnecessary expense, when the original outlay would give all that may be required. I have known very many people requiring licenses for all sorts of buildings, such as chapels, school-rooms, dancing academies, swimming-baths, halls, institutes, drill-sheds, club-rooms, &c., and these applicants have been refused because of the bad planning of their building.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XIX.

By JOSEPH HORNER.

THE protection of iron and steel from the corrosive influence of the atmosphere and from the deleterious gases contained therein is one of the most difficult and unsatisfactory problems with which civil engineers have to deal. Opinions differ widely as to the best methods of protection.

There are several methods which have been proposed, and employed in a greater or less degree, for the protection of the surfaces of iron and steel from corrosion. Some of these have a limited value for a narrow range of work; others are of most extensive application. Some are specially suitable for bright surfaces, some for rough surfaces. To the former belong the varnishes and lacquers, which hardly come within the range of the present subject; for the bulk of the work used by builders and contractors the protective coatings in common use are to be numbered on the fingers of one hand. They comprise the usual paints used with or without varnish, preparations of tar, the application of zinc (termed galvanising), japanning, and enamelling. The first named vastly exceeds in extent and importance the others. There is no other method than painting ever generally adopted for large structures in iron or steel, whether cast or wrought. Bridges, roofs, piers, &c., are always painted. Tar is employed chiefly for pipes and for foundations under water; galvanising is used for thin sheets—chiefly corrugated—for temporary roofing; japanning and enamelling for small work mainly. The Barfing process, and those of a cognate character, have a somewhat limited application both in range of utility, and in the bulk of the articles which can be treated.

It is quite a popular fallacy to suppose that to protect iron and steel any ordinary paint applied to unprepared surfaces will arrest or prevent the ravages of rust. Nothing is farther from the truth. Work which has been painted or repainted periodically has in many instances failed, solely in consequence of the ravages of rust, which have gone on unchecked underneath the supposed protective paint. This, however, is more particularly the case with wrought iron and mild steel, and it is due to the more or less fibrous or laminated character of those materials, and to the readiness with which they are affected by chemical

and galvanic action. Happily for the founder, cast iron does not suffer so greatly from the ravages of rust as the rolled and fibrous materials, and very ordinary care alone is requisite to preserve its surfaces intact. Internal corrosion, so common in wrought iron, does not occur in sound iron castings. Its ravages will, however, proceed in open and spongy localities. In a sound, homogeneous, close-grained, though not necessarily hard, white casting, I believe internal corrosion would be impossible. There is another distinction between wrought iron and steel and cast iron favourable to the preservation of the latter. It is this: that iron and steel plates invariably leave the rolls with a more or less firmly-adherent coating of magnetic oxide scale, which largely prevents actual contact between the paint and the metallic surface from taking place, with the result that corrosion proceeds rapidly underneath the surface of the scale. On cast iron, however, there is no scale, but a natural protection in the form of a hard skin of slightly chilled metal, produced by contact of the molten iron with the cold sand of the mould. This is so efficient, that in engineers' shops under cover castings will remain during many weeks—often, indeed, for months—without the slightest trace of rust forming upon them. If such castings are properly painted while in this condition, and repainted occasionally, they are practically invulnerable to the attacks of moisture in the atmosphere.

To many, however, the question will suggest itself, "Why, then, is so much cast-iron work found to become seriously corroded in the course of a few years?" The answer is not difficult. There are several causes which may contribute to this result:—(1) Delaying protection until after the corrosion has commenced; (2) the protection afforded being insufficient; (3) the protective material used being unsuitable, or else improperly applied.

In reference to the first, everyone knows how rapidly corrosion spreads after it has once commenced. In engineers' shops, bright metal-work—both in iron and steel—will often lie about for several weeks while in course of erection untarnished, though uncoiled. But if rust once begins, it soon spreads, and then emery-cloth and oil must be brought into requisition. That which goes on over the surface of ironwork also goes on under the surface of paint, if its ravages have commenced before the paint was applied. It is for this reason that inspectors who know their work are as stringent about the details of painting as about any detail of manufacture. I have often seen castings which had lain about exposed to weather for weeks or months until they were coated with rust, painted over while in that condition, or the worst of the rust has sometimes been rubbed off with a scratch brush. That should never be permitted. The plan which is very commonly adopted, and which answers well, is to coat all iron work which will be exposed to the weather during erection with boiled oil before it leaves the foundry. Nothing more is done to it until it has passed the survey of the inspector, and then it is painted. The boiled oil entirely prevents the formation of any rust, and being transparent, leaves the whole of the work open to examination. The oil is generally applied cold with a soft brush. But a better plan is to heat the castings before applying the oil. This, however, is scarcely practicable in the case of the largest work. But the oil can be applied hot, and that is the next best thing to do.

In work which is not exposed to the weather, the application of boiled oil is usually omitted, and paint is applied directly to the surface of the metal. The essential and fundamental condition of a perfectly clean surface, free from incipient rust, being assured, it depends on the nature and number of applications of the paint applied whether that surface shall be efficiently protected or not.

It is worthy of remark, as bearing on this question, that adequate protection is entirely a question of cost, one of good paint, and adequate labour. There is no work, I think, on which more expense is incurred in painting than in the locomotive. It takes about three weeks to paint and varnish and dry a locomotive; but once done, it needs no renewal for about five years, notwithstanding its constant exposure to heat and weather. In the case of most ironwork, three coats of paint are specified for. But there is often little or no supervision exercised over this very vital matter, and so the painting is often left



to the very day of delivery on the rail. There is an excess of driers put in, the coats are applied in immediate succession, often while the work is going out of the yard, even at the station, and being wet, a large quantity becomes rubbed off in transit, exposing the metal beneath. This is the usual practice in some firms in cases when inspectors do not deem the manner of painting a matter of sufficient importance to be followed through in detail.

Three coats of good sound paint should be applied to all ironwork exposed to the weather, and each coat should be thoroughly set and hard before the application of another. If the paint is thin, or rubbed, or chipped off over any areas, however small, rust will begin its ravages there, and proceed unchecked, and will not be arrested by subsequent paintings over. It is, therefore, clear—and, unfortunately, the records of some serious failures have emphasised the fact—that the method of application of paint to ironwork is of equal importance with the design itself. It is of no use to proportion a piece of work strongly and beautifully, and then, for want of adequate protection, to permit its strength and beauty to be destroyed by the insidious attacks of corrosion. Corrosion, too, is wholly preventible, being solely a question of cost and care.

Two kinds of paints are used mostly for the protection of iron—those whose bases are oxides respectively of iron and of lead. Each is preferred by some engineers to the other. It is a little curious that oxides should be used to protect metals from oxidation. Iron oxide paint is said to become a carrier of oxygen to the metal beneath, so facilitating corrosion, while lead oxide has not this property. Experiments might be adduced in support of these contentions. But exact data are badly wanted relative to the values of the two kinds of paint. As a matter of fact, engineers make extensive use of iron oxide paint, as well as of lead. The principal reason, doubtless, why exact results are difficult of attainment lies in the adulterants so commonly introduced into the cheaper paints.

A consideration of the differences in paints opens up the wide problems of stable and unstable oxides. It is certainly most desirable that whatever protective coating is applied to an iron surface, it should not be of such a character as to set up corrosive action in the metal it is desired to protect. That this has been the case in many instances experience has proved. This is no trifling matter when large works like the great railway bridges and station roofs are concerned; the cost of repainting a roof such as that of York Station being about £2,000. On all large works also the risks to life and limb of the workmen engaged in painting are very serious. Hence it is highly desirable that the best pigments should be employed, and used under the best conditions. Those formed of the oxides of lead are the best. It is on account of their cost that adulterants are used with lead, and that the paints with iron bases are largely employed in preference.

The value of a paint obviously consists in the degrees of protection which it affords to the surface over which it is laid. Hence the necessity of using a material which will afford a suitable body or covering over the surface. All pigments, therefore, consist of finely-triturated solid ingredients which do not combine chemically with, or become soluble in, the media in which they are mixed. The volatile matters in the media evaporate, leaving the pigment and the stable matters in the form of a thin layer. Boiled oil is the medium used with paints for ironwork, because it forms an elastic and firmly adherent skin upon the iron, one which will not be readily cracked nor chipped off by changes in atmospheric conditions. But since the oil alone lacks durability of resistance to the atmosphere, protection depends on the pigment for which the oil is only the medium. And this pigment, though in any case an oxide, ought to be a stable oxide—one, namely, which will not become decomposed into elements which will in turn act upon and set up oxidation on the surface which it is desired to protect. The oxides of iron used as pigments are not stable; those of lead are so.

The lecture experiment of shaking pure finely-divided iron from a tube into the air, in which it ignites, is a familiar illustration of the chemistry of common rust. The finely-divided iron, greedy for oxygen, becomes instantly converted into ferric oxide,  $\text{Fe}_2\text{O}_3$ . The same action occurs in the casting inadequately protected, but much more slowly, and with this addition:—Given a mass of metal on which a coat of sesquioxide or

red rust has formed, even though the action at the surface is arrested, the iron beneath will combine with a portion of the oxygen from the sesquioxide, leaving the latter at the protoxide,  $\text{FeO}$ . Neither of these oxides are stable, and since they form the basis of iron paints, they will, under suitable conditions, cause or aggravate the evil which they were intended to prevent. In cases in which iron paints have afforded good protection, it has doubtless been due to favourable conditions, as previous application of oil, the use of sound oil with the pigment, the prevention of the beginnings of rust, even laying-on of the paint and thorough drying-off. Since no rust can form in a dry atmosphere, and the observance of the foregoing conditions would absolutely prevent the access of moisture-laden air to the surface of the metal, even the chemical action of iron paints can be practically neutralised. But nevertheless it is not well to employ them on works of great magnitude, because the cost of labour is greater than that of material in cases where elaborate scaffoldings have to be erected, and also because the perfect protection of a costly structure, and one on which the lives of many may depend, is of far greater moment than that of the difference in the cost of paints.

There is one oxide of iron which is stable—the magnetic oxide,  $\text{Fe}_3\text{O}_4$ . This, when firmly adherent to iron, absolutely protects the surface beneath. This is the scale which is formed on wrought iron and steel during forging and rolling. A magnetic oxide paint was on sale a few years ago, but I am not aware to what extent it has been applied. The Barff and Bower-Barff processes, however, for the protection of ironwork have met with a large measure of success. The coating in these cases is one of pure magnetic oxide directly on the surface of the metal, and provided no fracture or chipping off of the oxide occurs, it is impossible for the metal beneath to become attacked.

It is on the red-lead paints that the builder and contractor have to rely mainly for the most perfect protection of outdoor work. Red-lead and white-lead oxides and carbonates respectively are the best in every respect for the protection of iron surfaces exposed to the weather. They mix with oil readily, are easily applied, and having no tendency to promote oxidation, afford all the protection desired. The white lead used should be pure, and not mixed with baryta, which is destitute of the body so essential an element in protection. If a structure is painted with pure white-lead paint mixed with boiled oil, there is little risk of chipping off occurring, because the paint is of a highly elastic character. It will not require repainting as often as one treated with iron oxide paints, and the old paint need not be scraped off before applying the new. Zinc oxide is used by some engineers as the basis of their paints; but it lacks body.

#### THE USE AND ABUSE OF AUCTIONS.

At a meeting of the Auctioneers' Institute of the United Kingdom, held in their rooms, 57, Chancery-lane, on Tuesday night, Mr. W. Roland Peck (Messrs. Hampton and Sons, London) presiding, in the unavoidable absence of the president, Mr. Everill, a paper was read by Mr. James F. Field (London), entitled "Auctions: their Use and Abuse." Mr. Field mentioned that the origin of sales by auction in this country was most difficult to trace, and it was singular that there was no textbook or work of reference on auctions. The earliest use of the word auction in England was stated to have been in the year 1595, and before the close of the 16th century auctions appear to have been known by the words "outrope," "outury," or "portsale," and many reference to them are found in our early literature. The first Charter of King Charles I. to the City of London of Oct. 18, 1638, created in London and Southwark a certain officer, called "outroper," or common crier, whose fees were:—"For selling all sorts of goods, one farthing in the 1s. For writing and keeping the books, 1d. in the 41. To the crier for crying the goods, 1s." Mr. Field went on to say that he had been unable to trace the origin of the auctioneer's hammer, which, however, was probably copied from its use by the chairman at public meetings. That the hammer was now legally recognised was shown by the Sale of Goods Act of 1873, in which it is enacted that a sale by auction is complete when the auctioneer announces its completion by the fall of the hammer. Turning to the practical part of

this subject, he said that the legal bases of the practice of an auctioneer were the Sale of Goods Act and the Act of 1867. The latter was the more important to them, as it referred to the sale of land, which, the Act said, should mean: "Any interest in any messuages, lands, tenements, or hereditaments of whatever tenure." Its object was two-fold—viz., to settle the puffing question, and to remedy the injustice of reopening biddings for properties sold by order of the Court of Chancery. Speaking of the terms in which auctioneers should permit themselves to describe the properties they had for disposal, he said that there was plenty of scope for literary and artistic finish without offending the canons of truth; and although it was a matter of opinion whether a mansion was handsome or stately or the reverse, a villa delightful and picturesque or vulgar, a suburban residence attractive or repellent, the statement that "jerry-built" houses are "thoroughly substantial," that properties distant a mile or so from a railway are close to a station, that rents manufactured by granting leases of freeholds more or less worn out for long terms are "freehold ground-rents," when it was obvious that the reversion would not be to a rack-rent, but to a building site, or that increased rents could immediately be obtained when the property was palpably rack-rented, were absolutely beyond "mis-description," and came dangerously near lying, and such practices might bring about the rescission of a contract, and would at least bring into disrepute any auctioneer who indulged in such so-called flights of fancy. Mr. Field next turned to the contract. It was not, he said, probably generally known—at least, by the public—that the auctioneer was the agent of the vendor, but that the assent of both parties was necessary to make a contract binding. The contract being signed, the auctioneer became, or should become, the stakeholder for the receipt of the deposit. Until the hammer had fallen, any bid could be retracted, notwithstanding, he believed, a condition to the contrary. He advocated, as one method of preventing abuses, which occasionally arose, the grant of a charter to the Auctioneers' Institute, and the bestowal upon it of powers and privileges analogous to those already enjoyed by other Chartered Societies. Statistics were given to show the enormous growth of sales by auction during the last half-century, and Mr. Field narrated some details of curious auctions. The sale by George Robins of the contents of Fonthill, when 8,000 guineas were realised by the sale of catalogues alone, was probably unique. The greatest abuse of auctions was the "mock auction," which obtruded itself in conspicuous places in every great town, and particularly in London. In conclusion, he said that the profession, for it had ceased to be a trade, had produced many men of light and leading. It needed only that the younger generation should take advantage of the educational opportunities of that Institute and that of the Surveyors' Institution, and be true to themselves and their calling, to preserve the reputation gained for it by the character of the men of the third quarter of the century, and to further raise the status already achieved by a profession which, viewed from the modern side, was little more than a century old.

#### NOTES ON DOMESTIC DRAINAGE.—VIII.

##### SOIL-PIPES.

SOIL-PIPES are usually constructed of lead or cast iron. Stoneware pipes have sometimes been used for this purpose, but they are most unsuitable, owing to the numerous joints required, and the difficulty experienced in making them thoroughly air-tight, in addition to their general unsightliness.

Wrought-iron and steel pipes put together with screw connections have recently been used for soil-pipes in the United States. They are protected from oxidation by one of the preservative processes usually adopted for iron pipes, such as the Angus Smith or Bower-Barff method. The advantages obtained by the use of these pipes are that they can be procured in long lengths, and are easily supported at the sides of the buildings, owing to their comparatively light weight. This latter consideration is an important one where the soil and ventilating-pipes are of great height, as in some of the lofty American buildings.

Where lead soil-pipes are used they should be in 10ft. lengths, and of the description known as "hydraulic drawn," the lead being of sufficient



thickness to weigh not less than 7lb. per superficial foot. It may be mentioned here that to comply with the London County Council's regulations, all lead soil-pipes must have a minimum substance of 7lb. lead.

The following is a table of the weights of hydraulic-drawn lead pipe usually employed for soil and waste-pipes—viz.:

WEIGHT OF LEAD SOIL AND WASTE PIPES PER 10FT. LENGTH.

Internal dia. of pipe.	6lb. thickness or 10in.	7lb. thickness or 11in.	8lb. thickness or 12in.	9lb. thickness or 13in.
2½in.	41lb.	48lb.	55lb.	
3 "	49 "	57 "	66 "	
3½ "	57 "	67 "	76 "	
4 "	65 "	76 "	87 "	
5 "		94 "	107 "	
6 "		112 "	128 "	

Soil-pipes are usually 4in. diameter, and for ordinary purposes no larger size will be required. Even in a large institution or public building a soil-pipe of greater diameter than 4in. will scarcely ever be found to be absolutely necessary.

The greatest drawback to the use of lead for soil-pipes is the liability of the pipe to "creeping," or a gradual downward movement of the metal, due to its expansion and contraction with every variation of temperature. The only remedy for this is to secure the pipe to the wall at short intervals with heavy cast-lead tacks. The tacks should be spaced not more than 3ft. apart, preferably in pairs, strongly soldered to the soil-pipe, and secured to the wall with stout pipe-nails driven into the horizontal joints of the brickwork or masonry.

The joints between lead pipes should, in all cases, be properly made with a well-wiped solder joint. With regard to the connection between the lead soil-pipe and the drain, the joint must be very carefully made so that it may prove permanently satisfactory.

Fig. 31 shows the usual method of forming the

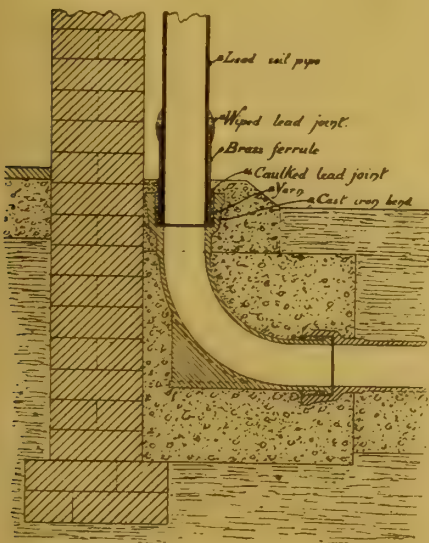


FIG. 31.

connection between a lead soil-pipe and a cast iron drain-pipe. To receive the soil-pipe the drain is turned up with a convenient socket bend, and firmly bedded in a block of concrete. A strong brass ferrule is passed over the end of the lead pipe and securely soldered thereto at its upper edge, whilst at the lower end the lead is well dressed over it and inserted in the iron socket. A few gaskets of yarn are then forced in, and the joint run with lead and caulked.

For stoneware pipes the joint is made in a similar way, neat Portland cement being substituted for the molten lead. Additional security may be given to the joint by afterwards surrounding it with 6in. of concrete. When the bend to the drain is of iron, it is better to have a "foot" cast on, as shown in Fig. 31, so that the bend may take a firm bearing on the concrete.

Cast-iron soil-pipes are being largely used in the place of lead soil-pipes with satisfactory results, more especially as they can now be obtained with enamelled and perfectly smooth interior surfaces. They are also free from the "creeping" tendency to which lead soil-pipes are

subject. Cast-iron soil-pipes should be of good tough grey cast iron, and fulfil all the conditions previously described for cast-iron drain-pipes, with the exception of the hydraulic test, as it is not necessary that they should be so strong and heavy as drain-pipes. They are generally made in 6ft. lengths, and may be obtained with or without ears for fixing to the wall. The following table shows the weight of cast-iron soil and waste-pipes, as required by the regulations of the London County Council.

WEIGHT OF CAST-IRON SOIL AND WASTE PIPES PER 6FT. LENGTH.

Internal diameter of pipe.	Weight per pipe.
3in.	40lb.
3½ "	48 "
4 "	54 "
4½ "	62 "
5 "	69 "
6 "	84 "

Cast-iron should be coated with some preservative to prevent oxidation. They may be "glass enamelled" inside, and painted externally after fixing, or coated with the "Dr. Angus Smith" process. Where the latter process is adopted, and it is required to paint them externally when fixed, the pipes must be given a coat of patent knotting before painting, so as to prevent the tar forcing its way through the painted surface.

The joints of all cast-iron soil-pipes should be run with molten lead, and well caulked. The pipes should be secured to the wall by means of iron holderbats or blocking-pieces, built into the brickwork or masonry, so that the pipes may be blocked off about 2in. from the wall. By this means sufficient space is given to allow of the pipes being painted all round, and the joints inspected at any time. Where pipes with ears are used, they should be blocked off, at least 1in. from the wall, by passing short pieces of iron pipe over each pipe-nail before fixing.

#### VENTILATING PIPES.

These may be of lead or cast iron, and the same precautions as regards the substance of the pipes, method of forming the joints, &c., should be adopted as already described for soil-pipes. Cast-iron ventilating pipes should invariably be coated with some preparation to prevent oxidation: otherwise the interior of the pipe is liable to be choked with accumulations of iron rust, and thus become utterly useless for ventilation purposes. Galvanised wrought-iron ventilating pipes in 6ft. lengths, with sockets for running with lead and caulking, are now manufactured. They can be obtained with or without ears, and are useful for situations where the ventilating pipes are required to be of great height.

#### WASTE-PIPES.

Where lavatories and baths are situated on the ground floor, the waste-pipes leading from them should discharge over a trapped gully. By this means complete air disconnection is established between the fitment and the drain. At the same time, the waste-pipes themselves must be efficiently trapped close to the outlet of the fitment, in order to prevent the passage of air from the outside to the inside of the building, as all air entering in such a way would of necessity become vitiated by contact with the fouled surfaces of the pipe. When these fitments are on an upper floor, the waste-pipes should discharge over the hopper-head of a vertical waste, which, in its turn, should discharge over a trapped gully. Being open to the air at both ends, the vertical waste will consequently be thoroughly ventilated.

In cases where a series of baths or lavatories are placed over each other, and discharge into one common vertical waste, it is usual for the waste-pipe to be carried up above the eaves, the lower end discharging over a trapped gully.

The vertical wastes are constructed of lead or cast-iron pipes, with air and water-tight joints, as described for soil-pipes. The size generally varies from 2in. to 3in. in diameter, according to the quantity of waste water to be removed. Even for a large institution it should scarcely ever be actually necessary to employ a vertical waste larger than 2½in. diameter.

The usual weights of cast-iron or lead vertical waste-pipes have already been given in connection with the table of weights of soil-pipes. The following table gives the weight and thickness of drawn lead pipe suitable for the branch wastes from baths, lavatories, and other sanitary appliances. Those given under the heading of

"strong" lead pipes are the weights required to comply with the regulations of the Metropolitan water companies, and are therefore suitable for use as service pipes to the various fitments:—

WEIGHT AND THICKNESS OF DRAWN-LEAD PIPES PER YARD RUN.

Internal diameter or bore of pipe.	Middling.		Strong.	
	Thickness.	Weight.	Thickness.	Weight.
½in.	14in.	4lb.	19in.	6lb.
¾ "	15 "	6 "	20 "	9 "
1 "	16 "	9 "	21 "	12 "
1½ "	18 "	12 "	23 "	16 "
2 "	19 "	16 "	22 "	18 "
2½ "	20 "	21 "	23 "	24 "

No waste-pipe should be less than 1½in. in diameter, and the outlet from the fitment to the waste—whether consisting of a perforated grating, valve, or plug—should in all cases be of sufficient effective area to allow of the waste-pipe running "full bore," so that both trap and waste may be thoroughly cleansed at each discharge. Waste-pipe of the following sizes are recommended so as to provide a "quick" waste, and also to assist in some measure to flush the drains:—Lavatory basin, 1½in. or 1¾in. diameter waste; urinal basin, 1½in.; butlers' sinks, 1½in.; baths, 1½in. or 2in.; scullery sinks, 2in. Where a lead or other safe is fixed under any sanitary fitment, it should be provided with a 1½in. diameter waste-pipe, discharging into the open air, and finished with a copper or brass hinged flap valve on the outside.

#### THE CONFERENCES AT CARDIFF AND BRISTOL ON THE STATUTORY REGISTRATION OF THE PROFESSION.

ON the invitation of the Society of Architects a meeting of local architects was held, to discuss the Registration question, at the South Wales Institute of Engineers at Cardiff, on Monday last, the President of the Society (Mr. E. J. Hamilton) occupying the chair. Letters of apology for non-attendance were read from Mr. G. F. Lambert, Mr. E. M. Bruce Vaughan, F.R.I.B.A., chairman of the local society, and Mr. Henry Budgen, A.R.I.B.A., heartily approving the objects of the meeting, and one from Mr. F. R. Kempson in opposition.

The CHAIRMAN, in opening the proceedings, stated that the Society was desirous of obtaining the views of provincial men on this question, and he hoped a full and free discussion would follow on both sides. This was a matter in which provincial men were more deeply concerned than men in town, and if any action was to be taken, they must be the prime movers.

Mr. ELLIS MARSLAND (hon. secretary) then delivered an address in which he briefly indicated the main features of the movement for the statutory registration of the profession and the progress that has been made since the well-remembered conference of architects to discuss the subject at the Freemasons' Tavern, London, nearly ten years ago—in April, 1886. It was decided at that meeting that it was desirable, in the interests of the architectural profession and of the public alike, that all architects in the kingdom should be united in one body, and further that a committee should be appointed with instructions to give effect to this resolution, and "to consider the means necessary in order to obtain an Act of Parliament making it compulsory for all architects to hold a Government diploma." The body formed as the outcome of these resolutions was known as the Architects' Registration Committee, and after careful consideration they came to the conclusion that in registration lay the essence of the whole. Accordingly they issued a circular to some 2,500 architects in practice in the United Kingdom, with a request that they should sign, if they thought fit, the following declaration: "Whereas we, the undersigned, are of opinion that it is for the benefit of the public and the architectural profession alike that legislative powers should be obtained, so that all persons hereafter entering the profession shall be duly qualified by examination, we are desirous that Committees should be formed to promote the object in view and to obtain the necessary Act of Parliament." Some 1,300 replies were received to this circular, of whom 165 were Institute members, and 175 members of the Society of Architects. After the receipt of these replies, a Bill was introduced into Parliament in 1887, which included architects, civil engineers, and



surveyors. This Bill excited the opposition of the two last-named bodies, and it was eventually decided that the Bill should deal only with architects, and a fresh Bill was introduced and was ordered by the House of Commons to be printed on the 7th of March, 1893. This was the extent of progress that had been made up to the present. Before any further progress can be made, Mr. Marsland continued, it will be necessary to show that there is something like unanimity among architects upon this question, and with the purpose of obtaining the views and opinions of provincial men, whom this question affects much more seriously than men in town, the Society of Architects is organising a series of meetings in the chief provincial centres, that architects may be brought together. Should it be found, as a result of these meetings, that there is a great preponderance of opinion in favour of registration, we shall be encouraged in our efforts to realise the object at which we aim. We, of course, cannot expect to make much headway with any Bill until we have convinced the Institute that their present attitude is a false and mistaken one, and by these meetings we hope to show them that they are acting in opposition to a large section of their provincial brethren, and also contrary to the best interests of the progress of architecture in this country. My society has no wish to take the lead in this much-needed reform, and if the Institute will but take the matter up in earnest and see it through, they will have the hearty co-operation of this society. It may be asked what is meant by registration? It means, in the present, that all men practising architecture shall be duly enrolled in an official register under an Act of Parliament, and be duly responsible for their professional actions, and that none be allowed to practise until they have been duly enrolled. In the future it means that none be allowed to practise architecture until they are duly qualified, and have been found so by undergoing a qualifying examination. At present, there are only three professions—the church, law, and medicine—to all of which it is considered an honour to belong, and why? Because to be a member of either is synonymous with having undergone a prolonged and complete course of study and preparation, which has fitted them for the position to which they have attained. Why is architecture excluded from among these? To possess the knowledge to build, and the skill to plan and design a building, and to deal with the innumerable questions—scientific, artistic, legal, and sanitary—which continually present themselves in ordinary practice, requires a training as arduous and as prolonged as that of any other professions. But the answer is not far to seek. At present, any person with or without a fair general education, any builder, builder's foreman, clerk of works, clerk in a local board office, auctioneer, undertaker, *et hoc genus omne*, with the sole qualification of being able to provide a brass plate, is at liberty to advertise himself as a person qualified to give advice to the public in the science and art of architecture. Builders and others making their living by trade boldly proffer their services as architects to their customers gratis; and the tempting bait of an apparent saving of five per cent. is not to be resisted. Can it be wondered at that we are still unrecognised while such a condition of things exists, and while the public have no guarantee that the class who call themselves architects are any better qualified to plan and design their buildings than the contractors who carry them out, and they have no warranty should they employ an architect, that his knowledge is greater than that of the builder, and the only certainty about it is they will have to pay the professional charges? Of what use is it for the Institute to say that their examination is a panacea for the existing evils unless this examination is made compulsory? And until men find, that by undergoing a course of study and passing an examination, they are placed in a better position in the eyes of the public than the man who possesses no qualifications at all, it is very unlikely that an appreciable number of men will voluntarily come forward and avail themselves of this means of entering the profession. The only compulsory examination at present is that under the London Building Act, and only affects some 70 professional men who seek office as district surveyor under that statute. The necessity for a higher standard of professional excellence and public confidence is of essential importance to provincial men. There is a feeling—a mistaken one, if you will—

that local architects are all very well for the ordinary work of the town, but so soon as any work of primary importance is to be executed, architects from outside must be invited to compete. Does not this arise partly from a want of confidence, there being no guarantee in employing a man who is styled an architect that he really knows his business? In nine cases out of ten, however, the local man, from his knowledge of the materials of the locality, and the special requirements of his fellow-townsmen, is more likely to carry out the work satisfactorily than an architect from a distance. The advantages arising from registration are these:—(a) Closing the doors to incompetent men; (b) raising the standard of the profession; (c) Obtaining the confidence of the public and State recognition. It is not proposed to say that all who desire to build should employ an architect; but what we do propose is that henceforth, in the interests of the public, no person shall be entitled to call himself an architect whose name is not enrolled as qualified under an Act of Parliament. Objection has been urged against the movement that it will create a monopoly; but there cannot be a monopoly created where it is made possible for anyone who qualifies himself to be able to share the rights. Another objection is that you will have in starting to register some of the very men who have caused all the mischief. This is very true, and unless you do this you will find that Parliament will not listen to you. That you must respect vested interests is an axiom of Parliamentary practice. The obstinate attempt to exclude this principle from the Medical Act was the chief cause of delaying its passage through Parliament for 30 years. The first effect of a Registration Act would be to put a stop to any further increase in the number of incompetent practitioners, and henceforth they would become a diminishing quantity. Having given a general outline of the Registration Bill, Mr. Marsland added:—Such a Bill has been drafted by the Registration Bill Committee, and I take this opportunity to correct an erroneous impression that is abroad, that this Bill is the child of the Society of Architects. That it meets with the general approval of that body is no secret, but the society is by no means pledged to it in all its details; it may be necessary to amend it in some particulars, and the object of this meeting is to elicit the opinion of architects on the general question, and not upon the details of any particular Bill. The time may come when, with certain modifications, the Society of Architects may adopt it, but not until the general sense of the architectural profession has been declared definitely in favour of the principle. If architects want such a measure, this society will leave no stone unturned to bring about its realisation. If, on the other hand, the general feeling is against any registration scheme, we shall be content to let the matter drop. Gentlemen, the matter is in your hands.

At the conclusion of the address Mr. GEORGE THOMAS, of Cardiff, proposed the following resolution:—"That this meeting cordially approves the principle of the statutory examination and registration of architects, and is of opinion that it is desirable, in the interests of the public and the architectural profession, to promote a Bill in Parliament for the attainment of this object." He stated that the question was of great importance to architects, especially to the younger men, who, after a long course of study and work, found themselves in no better position in the eyes of the public than the man who, without any study or experience, chose to call himself an architect. This question was not to be looked at in the light of the Institute v. The Society of Architects, as the latter society wanted the institute to take the matter up, and if they should do so the society would heartily co-operate with them. The great difficulty was in registration, to know what to do with incompetent men already in practice.

Mr. FRANK BALDWIN seconded the motion. He was keenly alive to the necessity of some such measure as was suggested, and to show his interest in the movement he had come all the way from Brecon to attend the meeting. In his town he had to compete with an inspector of nuisances, a builder, and a lawyer's clerk, all of whom posed as architects.

Mr. E. H. BRYTON, F.R.I.B.A., of Cardiff, said he failed to see if such a Bill as was suggested should be passed, how it would be of any real benefit to architects, as a man might call himself a surveyor and still do architect's work,

and by this means defeat the intentions of the measure.

Mr. ASHFORD opposed any legislation, on the ground that he failed to see how an architect, who was an artist, could be qualified by examination in a similar manner to a doctor or lawyer, and he was under the impression that the effect of any Act would be to hamper the best interests of architecture as an art.

Mr. T. P. MARTIN, of Swansea, thought that although it was impossible to examine a man to discover his artistic merit, yet there were other points that went to make up an architect, and it was these points that could be tested by examination. He could not see why the Institute were so opposed to the principle: they could scarcely know what provincial men had to put up with.

The PRESIDENT, having summed up the discussion, fully endorsed the remarks of Mr. Thomas as to the non-existence of any antagonism to the Institute, and put to the meeting the motion, which was carried by a large majority.

A vote of thanks to the president and the hon. secretary concluded the proceedings.

A meeting of a similar character was held at the Guildhall, Bristol, on the following evening (Tuesday), the President, Mr. E. J. Hamilton, again presiding. Letters of apology for non-attendance were read from the Mayor, Mr. Lewis Fry, M.P.; Mr. Thomas Owen, M.P.; Mr. Robert Walker, of Cork; Mr. W. H. Seth-Smith, F.R.I.B.A.; Mr. Ernest Day, F.R.I.B.A.; Winchester; Mr. Roberts, Taunton; Mr. Hy. Prothero, Cheltenham; Mr. G. H. Phillott, Cheltenham; Mr. A. E. Pearson, Cheltenham; all of whom expressed cordial approval of the objects of the meeting; also a letter from Mr. W. L. Bernard, F.R.I.B.A., expressing his disapproval of any registration scheme.

The PRESIDENT shortly stated the objects of the meeting, and called upon the Hon. Secretary to deliver an address.

At its conclusion, Mr. HERBERT J. JONES, of Bristol, moved the same resolution as at the previous meeting, and stated that a few years ago he took an active part in getting a petition signed in favour of a Bill to be then introduced. Objections were raised to some of its provisions, especially that relating to admitting all men then in practice; but it was found that Parliament was bound to protect those who were already gaining a living by their practice, and would not listen to the suggestion that these men should be shut out.

Mr. W. P. SAUNDERS, of Bristol, seconded the motion, stating that the need of such a reform was so apparent that it hardly needed any comment, and the sooner it was achieved the better.

Mr. R. C. JAMES, of Bristol, desired to know more of the class of people at present in practice it was proposed to register, as he was opposed to everybody being included.

Mr. THOS. A. WESTON, A.R.I.B.A., Bristol, was afraid that if architects stood on their dignity too much, the public would, as many did now, get their work done by builders, without the intervention of an architect at all. He was, therefore, not in favour of the measure.

Mr. J. HART (Bristol) also spoke, but preferred to remain neutral.

The PRESIDENT, having summed up the remarks, put the resolution to the meeting, which was carried, with one dissident.

The corporation of St. Helen's, Lancs, have accepted with thanks an ornamental fountain of terracotta, presented by Sir Henry Doulton, for Victoria Park.

At the Chester Consistory Court on Friday, the chancellor of the diocese granted a faculty for placing stained glass in eight windows in St. Mary's Church, Tilston, the cost of which, over £700, is to be borne by Lord Stanley of Alderley.

Members of the Skinners' Company visited Tonbridge on Saturday afternoon for the purpose of opening a new second-grade school, which the Company have just built at a cost of upwards of £10,000. Some few years ago a commercial school was started on a tentative basis, and such was its success that the Governors procured a site, eight acres in extent, and not far from the railway station, on which to erect the present structure. Mr. W. Campbell Jones is the architect, and Messrs. Thomas Turner and Co., Limited, of Watford, were the contractors. The principal schoolroom measures 70ft. by 33ft., and there are also classrooms, workshops, and a gymnasium.



## CONTENTS.

The "Crib" .....	443
Are Architects' Fees Conditional? .....	444
The Architectural Association .....	444
Architectural Association Visit .....	447
The Technical Education Board Exhibition .....	447
Concert-Halls and Assembly-Rooms.—XIV. .....	448
Cast-Iron in Builder's and Contractor's Work.—XIX. .....	449
The Use and Abuse of Auctions .....	450
Notes on Domestic Drainage.—VIII. .....	450
The Conferences at Cardiff and Bristol on the Statutory Registration of the Profession .....	451
The Building News Directory .....	451
Our Illustrations .....	453
Polytechnic Visit to the Passmore Edwards Library, Uxbridge-road .....	453
Building Intelligence .....	472
Builders' Clerks Benevolent Institution .....	473
Obituary .....	473
Architectural and Archaeological Societies .....	474
Correspondence .....	474
Intercommunication .....	474
Legal .....	475
Legal Intelligence .....	475
Parliamentary Notes .....	476
Water Supply and Sanitary Matters .....	476
Our Office Table .....	476
Meetings for the Ensuing Week .....	478
Trade News .....	478
Tenders .....	478

## ILLUSTRATIONS.

THE RESTORATION OF THE MARIENBURG.—AN INSTITUTE OF ARCHITECTURE.—WESLEYAN CENTENARY CHAPEL, NEWCASTLE-ON-TYNE.—HOUSE AT BUXTON.

## Our Illustrations.

## THE RESTORATION OF THE MARIENBURG.

We give two double pages of photo-tints and two pages of plans, &c., of the celebrated group of Commandery buildings belonging to the Teutonic order at Marienburg on the Nogat, which formed the subject of Mr. C. FitzRoy Doll's paper at the Architectural Association last Friday, a report of which appears elsewhere in this issue.

## R.I.B.A. SOANE MEDALLION COMPETITION.—AN INSTITUTE OF BRITISH ARCHITECTS.

We have already illustrated the design awarded the Medal of Merit in this contest. To-day we publish the view and plans of the design to which the Council awarded Honourable Mention, by Mr. E. A. Rickards, whose motto was "Bow Bells." The interior arrangements of his scheme are clearly set forth by the two floors illustrated, and the drawing represents the façade admirably.

## CENTENARY WESLEYAN CHAPEL, NEWCASTLE-ON-TYNE.

This place of worship has recently been erected in one of the new suburbs at the west-end of the city. It occupies a commanding position at the top of Arthur's Hill, just off the main thoroughfare of Westgate-road. The principal frontages are in Dilston-road and Callerton-place. There is also a side street parallel to the latter, and windows face into each of these, so that the interior of the building is exceedingly well lighted. The premises comprise a chapel, to accommodate 850 persons (including gallery), vestries for the use of minister, stewards, and choir, caretaker's house, lecture-hall to hold 400, infant-school, several suites of class-rooms for senior scholars, and kitchen vestry, fitted up with tea-boiler, china-store, &c. The walls are built with Kenton stone, hammer-dressed on the exterior face, and the ashlar and moulded work clean chiselled. The internal fittings are executed in pitch-pine, the entrance-screens, lobby doors, and window openings being filled in with lead glazing of subdued tints. The heating is by hot water on the low-pressure system, radiators being fixed at the entrances. The vitiated air is extracted by means of Robert Boyle and Son's air-pump ventilators fixed in the roof-turrets; from these galvanised iron tubes are carried to the ceilings, and Stott and Co.'s ventilating "reflex" lights are placed under the openings to assist the upcast. Ample provision has been made for the inlet of fresh air, and arranged so as to avoid draught. The total cost of the buildings, exclusive of land, has been £5,995. Mr. C. H. Mauchlen, of Newcastle-on-Tyne, was the sole contractor, Mr. James Anderson being responsible for the joiner's work, and Messrs. Robson and Sons for the special fittings and cabinet-work. The furnishing and upholstery was intrusted to Messrs. Bainbridge and Co., and the painting and decoration to Mr. J. G. Cole. The plumbing work was executed by Mr. J.

Rowell, and the heating by Messrs. Dinning and Cooke—all of Newcastle. Mr. R. Yates acted as clerk of works, and Mr. J. W. Taylor, F.R.I.B.A., of Newcastle, was the architect.

## HOUSE AT BUXTON, DERBYSHIRE.

This house, for Mr. David Sherratt, of Chester, was erected some three years or more ago, from the designs of Mr. W. R. Bryden, F.R.I.B.A., of Buxton. It is built of Yorkshire rippings or parpents, with local gritstone dressings, and is handsomely fitted and finished internally.

## CHIPS.

At the instance of Mr. Redgrave, Inspector of Factories, Messrs. Edwards and Medway, builders, of Ethelred-street, were summoned to Lambeth Police-court on Saturday for failing to give notice of an accident which had occurred at their works. They pleaded that they did not know the requirements of the Factory Acts in this respect. They were ordered to pay £3 and the costs.

The Duke and Duchess of York, on their visit to Halifax in the summer, will probably open the new markets on their return from the infirmary to the railway station. The markets, of which Messrs. Leeming and Leeming were the architects, will, when completed, have cost at least £100,000. They were illustrated in our pages by a double-page plan and elevations on October 2nd, 1891.

It is expected that the new Cruden railway, from Ellon to Bowden, 15 miles long, will be opened for traffic by the Great North of Scotland Railway Company in the course of the summer. The doubling of the Great North main line between Insh and Gartly is being carried rapidly forward, and it is proposed to continue it on to Huntly, and beyond, as speedily as possible.

Estate business was remarkably brisk at Tokenhouse Yard last week. The aggregate recorded was £94,073, a considerable one for the month of March, and far in advance of that registered for the corresponding week of 1895, £64,157. Leasehold and freehold town houses and residential properties of the better class in favourite suburban localities failed to sell, but for sound investments of all kinds the demand was very active.

The Town Council of Kendal have recently commissioned John Smith and Sons, Midland Clock Works, Derby, to make a very large clock for their new town hall. It will have four 7ft. dials, play the Westminster quarter chimes, and also play seven tunes upon ten bells, the largest being 36 cwt. Four leading firms of clockmakers sent in general proposals, and the Town Council have been acting under the advice of Lord Grimthorpe in the matter.

The town council of Southampton decided at their last meeting to raise the salary of the borough surveyor, Mr. W. B. G. Bennett, by £100 a year, on the ground that Mr. Bennett will for some time to come be engaged on important works, and if an independent engineer were employed the cost would probably be 5 per cent. on the £40,000 to be expended in the carrying out of the projects in hand.

At the town-hall, Tiverton, on Wednesday week, Major-General Phipps Carey, R.E., held inquiries on behalf of the Local Government Board into applications made by the urban council to the Local Government Board for permission to borrow £26,500 for the purchase of gasworks, the carrying out of works of sewerage, and street improvements. Mr. J. Siddalls, town surveyor, was the chief witness in relation to the whole of the applications.

At a meeting held at Shrewsbury, on Saturday, it was decided that the proposed memorial to the late Archdeacon Lloyd should take the form of a stained-glass window in the Chapter-house of Lichfield Cathedral, and the restoration of the north porch of St. Mary's Church, Shrewsbury.

On Friday Earl Derby, G.C.B., as Lord Mayor of Liverpool, unveiled a stained-glass window erected at the Stanley Hospital in that city in memory of the 14th Earl of Derby by the tenant on the Knowsley estate. The window was designed by Messrs. Duckworth and Medcalf, the architects to the hospital, and has been executed by Messrs. Williams and Watson, also of Liverpool; it is Late Gothic in style, and contains a portrait of the late Earl, reproduced from the one at Knowsley.

Professor Herkomer was, on Saturday, elected a Foreign Associate of the Academy of Fine Arts of Paris, in the room of the late Lord Leighton.

The City Corporation have now under consideration, but have not yet decided upon, the following suggested improvements:—Reconstruction of the City's stables, which may lead to an expense of £5,000; extension of the landing-stage at Billingsgate, £6,000; reconstruction and readaptation of the fruit, vegetable, and flower market, £9,000; new police-station, £12,000; and renovation of Freeman's Orphan School at Brixton, £900.

## POLYTECHNIC VISIT TO THE PASSMORE EDWARDS LIBRARY, UXBRIDGE-ROAD.

ON Saturday last a party of the Regent-street Polytechnic Architectural and Engineering Society visited this new public library now nearing completion near Shepherd's Bush-green for the Libraries Commissioners for Hammersmith. Mr. Samuel Martin, the chief librarian, and Messrs. Johnson and Co., the builders, attended to meet the visitors, who were led by their President and by the hon. sec., Mr. A. Cheetham. The working drawings and contract plans were shown, and the architect, Mr. Maurice B. Adams, conducted the party over the building. The metal casements are by Messrs. Burt and Potts; the chimneypieces and wrought-iron gates to the main entrance were made by Mr. Thomas Elsley, the quarry glazing was executed by Mr. Aldam Heaton, the iron staircase by Messrs. MacDowell, Stevens, and Co., the lift by Messrs. Archibald Smith and Co., the heating by Mr. Grundy. The wrought-iron fence and gates are being made by Messrs. Hart, Son, Peard, and Co., the tiles by Messrs. W. Godwin and Co., of Lugwardine; the ventilating by Messrs. Boyle and Son. Dr. Teale's grates are used. Mr. Gilchrist is the foreman in charge. Refreshments were provided by the builders for the visitors, and votes of thanks were passed by acclamation at the conclusion of the proceedings.

## COMPETITIONS.

PENARTH.—In the recent Penarth Board School competition, confined to local architects, the design submitted by Mr. J. H. Phillips, St. John's-chase, Cardiff, was placed first by the assessor, Mr. E. R. Robson, London. The Board have appointed Mr. Phillips to carry out the work.

The new Constitutional Club buildings at Castle Carey, which have been erected by Messrs. Francis Brothers at the angle of Woodcock-street and Bailey-Hill, will be opened by the Earl of Selborne on Tuesday, April 14th.

The York Corporation have received a report from Professor Kennedy on the scheme for illuminating the city by means of the electric light. He recommends the increase of the proposed loan from £15,000 to £20,000, so that the work may be carried out efficiently. The corporation have resolved to ask Professor Kennedy to meet them about the middle of April to discuss the matter.

New board schools are rapidly approaching completion in North-road, Plymouth. They are Elizabethan in style, and built of local limestone on a plinth of Dartmoor granite, the dressings being of Ham Hill and Portland stone. The planning is on the central-hall principle. Accommodation has been provided for 785 children in two departments, at a cost of £10,300, exclusive of site. The desks are of Orlam, a Canadian wood, and have been made by the Bennett Furnishing Company, London and Glasgow, to designs by Mr. J. W. Trevan, the clerk of works.

Jones's Hotel in Shophatch, Shrewsbury, has just been opened after rebuilding. The hotel, which is from the designs of Messrs. A. B. and W. Scott Deakin, architects, of the same town, consists of four floors, and has a front of red Ruabon bricks and Grinshill stone dressings, freely treated in the Renaissance style. The general contract has been carried out by Messrs. Treasure and Son, of Shrewsbury.

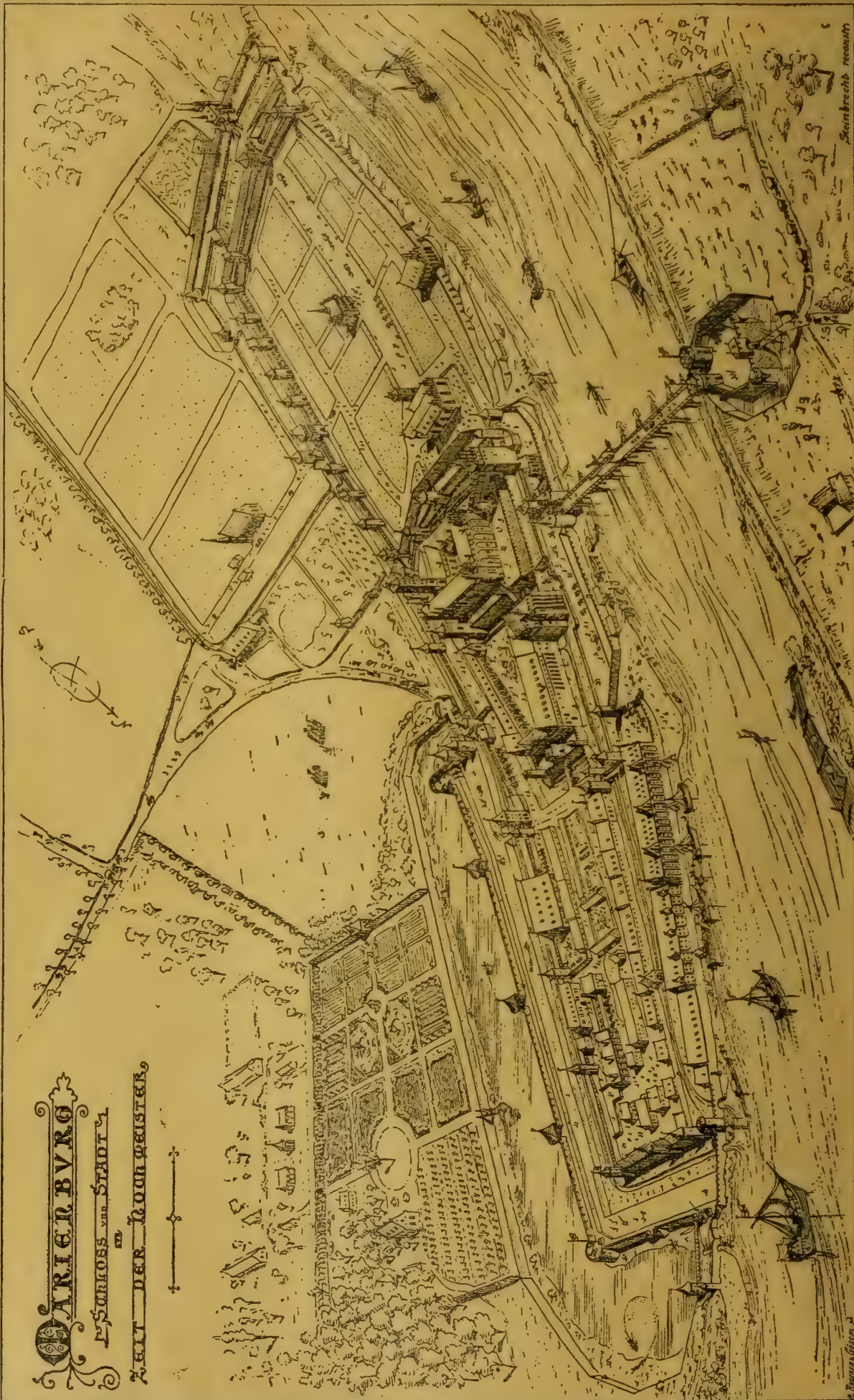
So generously have Wykehamists all over the world responded to the efforts made for the establishment of the Winchester College Quingentenary memorial fund that the total is now over £10,000. Emboldened by this proof of sympathy, the committee now intend to complete the work in hand upon the largest scale. The completed building will cost in all £10,741, and another £1,000 is required for work in Founder's Chantry at Winchester Cathedral, so that a still further sum of £1,750 is required.

The Insanitary Property and Artisans' Dwellings Committee of the Corporation of Liverpool considered, on Friday, the proposal to build houses for the working classes in Ford-street and Gildart's-gardens, in accordance with plans which have been prepared by the city engineer, Mr. H. Percy Boulnois. It was decided, after a prolonged sitting, to recommend the city council to authorise the engineer to carry out the construction of the houses without resorting to outside contractors.

The Secretary of State for the Home Department has appointed Mr. Arthur Whitelegge, M.D., now medical officer of health to the West Riding of Yorkshire County Council, to be Her Majesty's Chief Inspector of Factories, in succession to Mr. R. E. Sprague Oram, retired.



MARIENBURG  
FESTUNGS- u. STADT-  
PLAN  
NACH DER KÖNIGLICHEN  
KARTEN- u. PLAN-  
KAMMER



Verlag von  
H. W. Neumann, Neudamm







WESLEYAN CENTENARY CHAPEL

AT NEWCASTLE-ON-TYNE.

I W TAYLOR FRIBA ARCHT







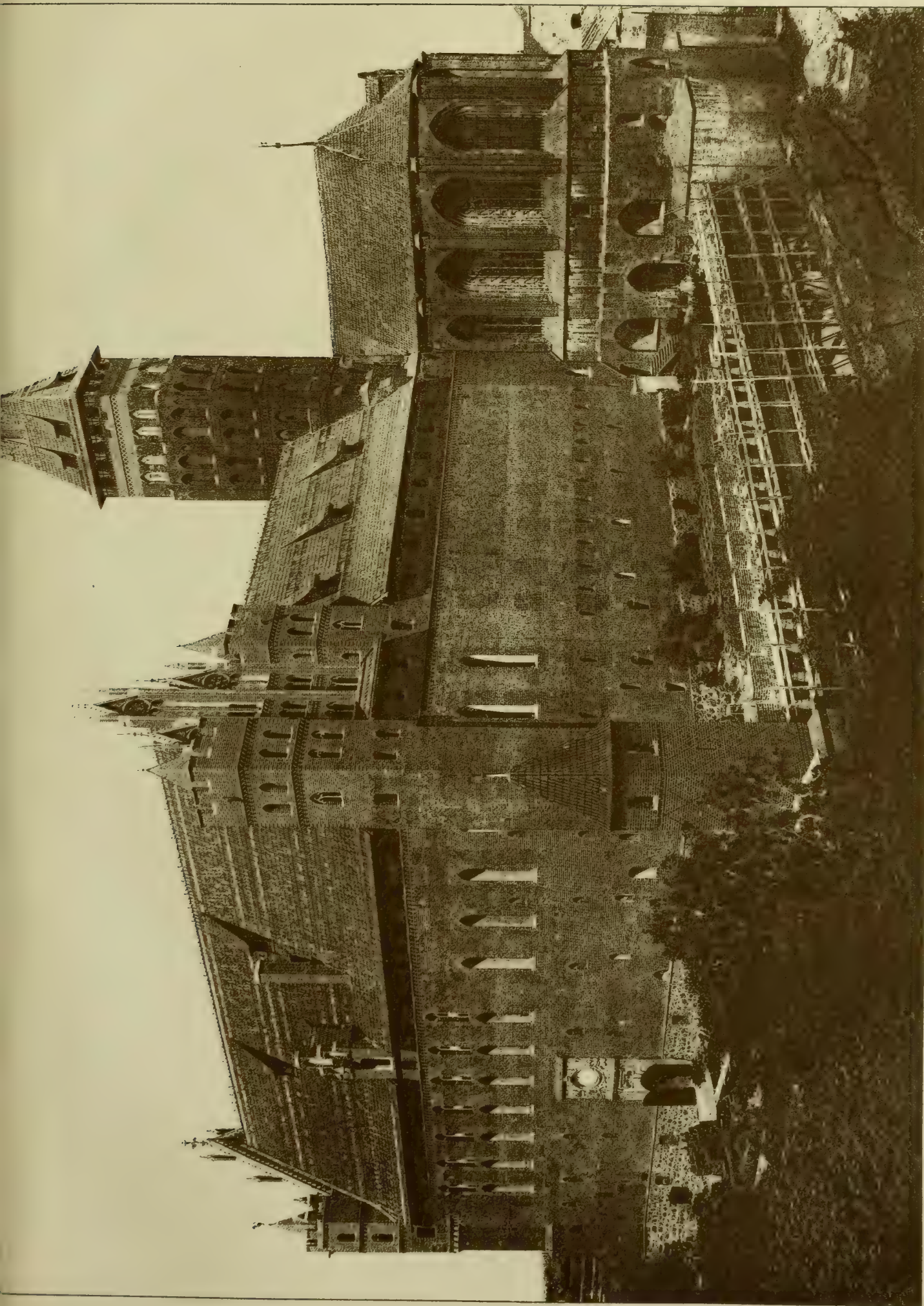


VIEW OF THE MARIENBURG FROM THE NOCAT BEFORE RESTORATION.



VIEW OF THE HOCHSCHLOSS FROM THE N.E.





"PHOTO-TINT" by James Akerman of Queen Square London W.C.

ILLUSTRATING PAPER ON THE RESTORATION OF THE MARIENBURG BY C FITZ ROY DOLL ARCHT













THE REFECTORY AFTER RESTORATION



ILLUSTRATING PAPER ON THE RESTORATION OF THE MARIENBURG

BY C FITZ-ROY DOLL ARCHT



S-CLOISTER GALLERY (FIRST FLOOR) THE HOCHSCHLOSS

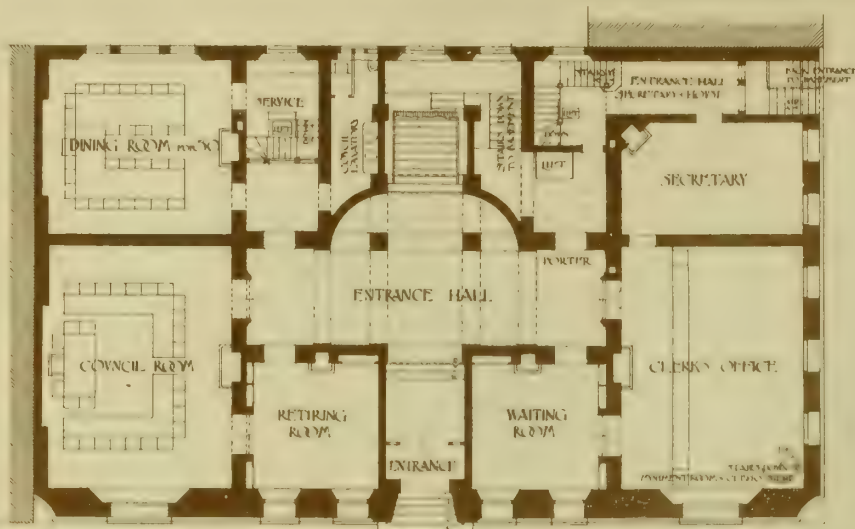












GROUND FLOOR PLAN

RIBA SOANE MEDAL

AN INSTITUTE

HONORABLE MENTION AWARDED



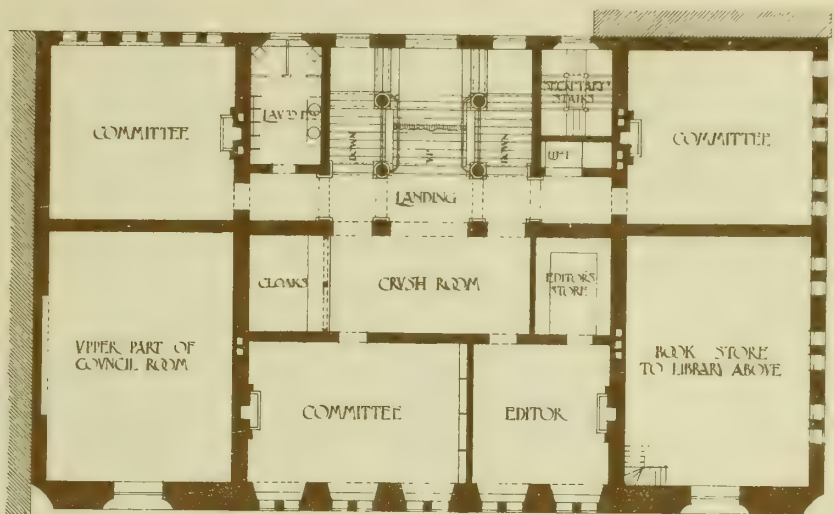


5. MAR. 27, 1896.

LION COMPETITION

ARCHITECTS

ED. E.A. RICKARDS



FIRST FLOOR PLAN



DESIGN FOR  
AN INSTITUTE  
OF BRITISH  
ARCHITECTS



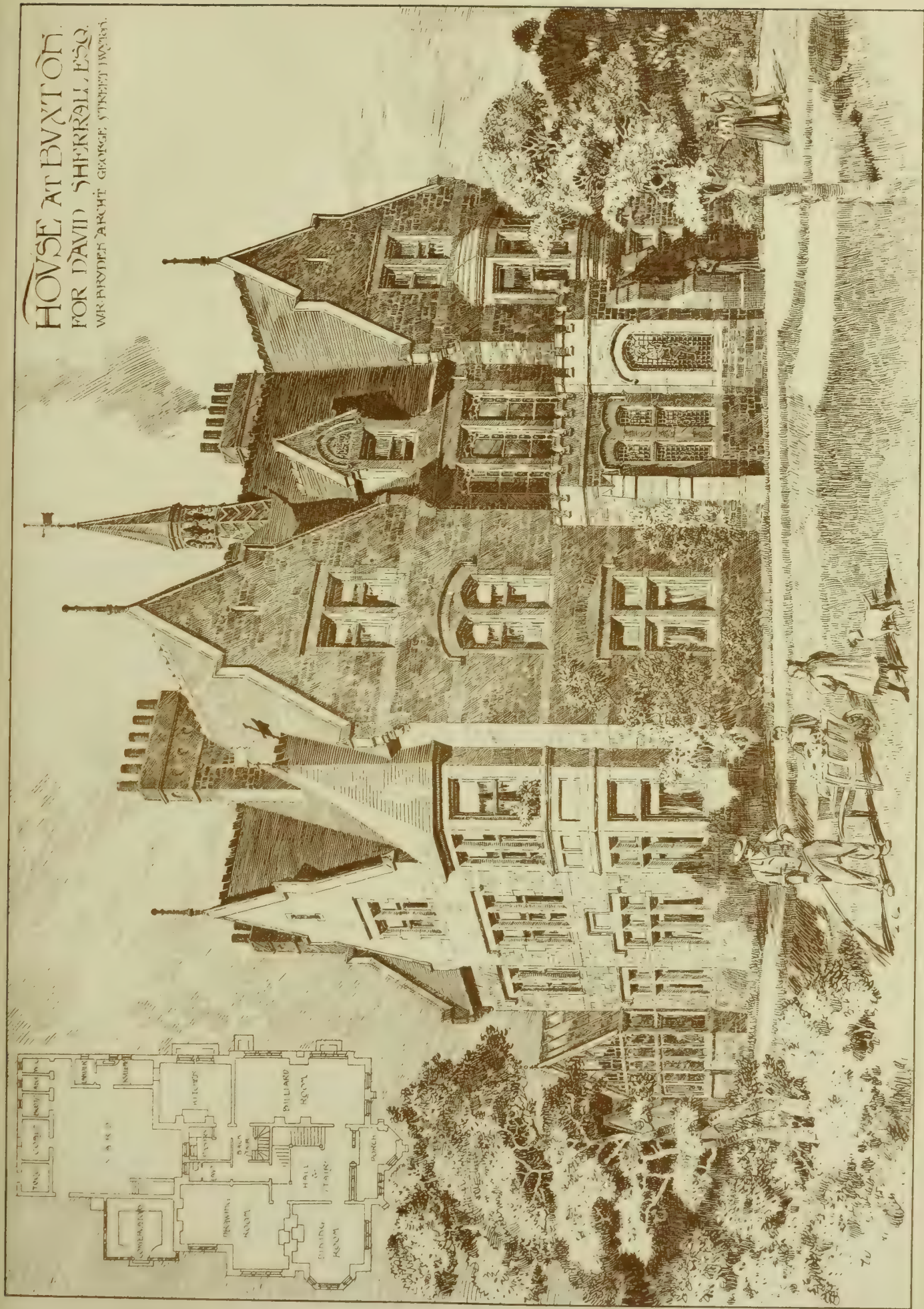
By  
BOW  
BELLS







HOUSE AT BUXTON.  
FOR DAVID SHERRILL, ESQ.  
WR. PINDER ARCHT. GEORGE STREET, MANCHESTER.







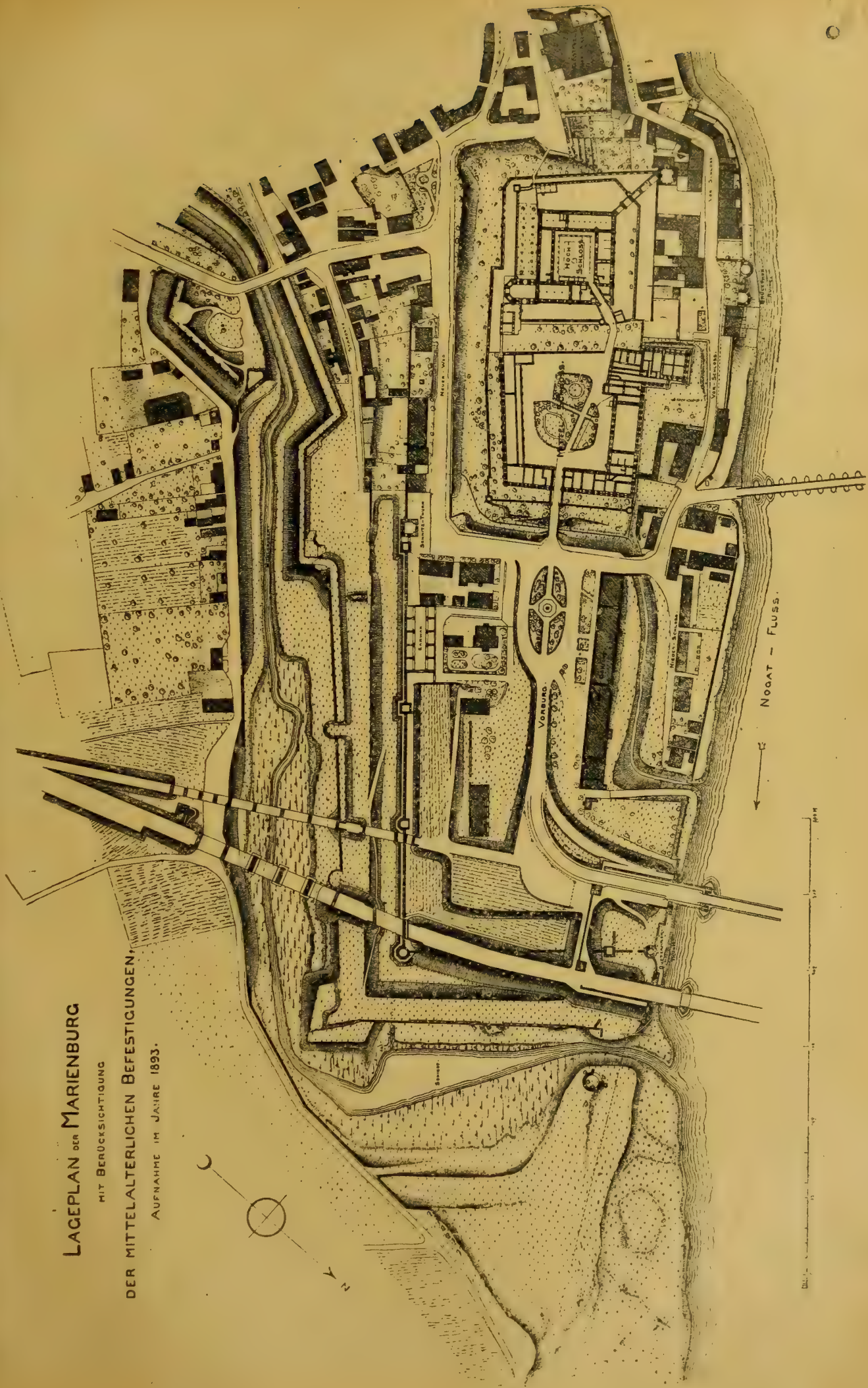


# LAGEPLAN DER MARIENBURG

**HIT BERÜCKSICHTIGUNG**

DER MITTELALTERLICHEN BEFESTIGUNGEN,

AUFNAHME IM JAHRE 1893.





## Building Intelligence.

**BISHOPSGATE, E.C.**—The new offices of the Jewish Board of Guardians, in Widgate-street, Bishopsgate-street, which were formally opened on Sunday, consist of a block of buildings, four stories in height, with a frontage following a Z outline on plan. The front is of red brick, relieved with stone and red concrete strings. The building is of fireproof construction throughout. The building has been erected by Messrs. E. Lawrance and Sons, from designs supplied by the hon. architects to the Board, Messrs. Davis and Emanuel. There are three entrances, the main one in the centre of the building, and one at the extremity of each wing. Entering the building by means of the principal door, on the right hand are found the clerks' offices, waiting-rooms, and the secretary's room. On the left hand are the committee-rooms and the waiting-rooms of the relief department. On the first floor are several committee-rooms, and a board-room measuring 32ft. by 26ft. On the second floor there is a large double room—which will be used as a girls' work-room, also a dining-room for the girls and a small room for the superintendent. On the top floor are the adult sewing-class room, the rooms set apart for the clothing department, and the caretaker's apartments. The second and third floors are approached by a staircase leading from the right-hand side door, the object being to keep apart the applicants for relief pure and simple, and those who are being employed or taught by the Board. The basement contains the industrial department, including a master's-room, clerks' office and waiting-rooms, and also the loan department.

**BLACKFRIARS, E.C.**—The memorial-stone of the new fire-engine-station now in course of erection in John Carpenter-street, E.C., was laid on Thursday afternoon in last week by Mr. W. Urquhart, chairman of the Fire Brigade Committee of the London County Council. The site, which cost £16,000, is at the back of Sion College and the Thames Conservancy offices, and nearly opposite the Guildhall School of Music. The building will be eight stories in height, while the top of the look-out tower will be 120ft. above the pavement. Accommodation will be provided for two steamers, four horses, and nearly sixty men, with their wives and families. The cost of the building, which is being built from designs by Mr. Thomas Blashill, superintending architect to the County Council, will be £21,000.

**BLACKFORD HILL, EDINBURGH.**—The formal opening of the Royal Observatory on Blackford Hill, overlooking Edinburgh, is to take place on Tuesday week, April 7. Lord Balfour of Burleigh, the Secretary for Scotland, will be present, and it is expected that the proceedings will be taken part in by Lord Crawford and astronomers from this country and from abroad. We illustrated the Observatory buildings, which have been erected by Messrs. W. and J. Kirkwood, of Edinburgh, at a cost of £35,000, from plans by Mr. W. Wybrow Robertson, of H.M. Office of Works, in our issue of June 17, 1892. The Edinburgh Architectural Society on Saturday made their third visit of the season to the Observatory, by permission of Professor Copeland. There were over fifty members present, and under the guidance of Mr. Ramsay they were conducted over the building.

**DEWSBURY.**—The new free library and public baths at Dewsbury are nearing completion, and will be formally opened early in May. They have been constructed from designs by Mr. G. E. T. Laurence, A.R.I.B.A., of Queen Victoria-street, E.C., selected in open competition. The site upon which the new buildings stand is bounded by Wellington-street, Wheelwright-street, West-street, and Tunncliffe's-yard. Immediately opposite the entrance to the library in Wellington-street is the lending library, 39ft. 6in. by 21ft. To the left of the central hall is a boy's room, 21ft. by 14ft., and also a ladies' room 19ft. 6in. square. To the right of the hall is the news-room, 50ft. by 33ft., and adjoining is the reference department, a room about 30ft. square. Immediately above the ladies' room and of similar dimensions is the committee-room, which has panelled walls and oak floor. In the adjoining building are two swimming-baths, each 75ft. by 25ft., slipper baths, Turkish baths, &c. Around the first-class bath-room there is a gallery, and in the second-class bath-room there is a soap-

bath about 8ft. square. Between 40 and 50 dressing-boxes are provided in connection with each of the swimming-baths. Of slipper-baths there are 32—18 for gentlemen and 14 for ladies. In the basement are Turkish baths, including three hot-rooms, a cooling-room, a shampooing-room, and a plunge-bath. The total cost of the new library premises and baths is estimated at about £20,000. Messrs. E. Chadwick and Sons, of Staincliffe, are the contractors. The clerk of the works is Mr. English.

**IPSWICH.**—The board of guardians adopted at their last meeting revised plans for the erection on a fresh site in Woodbridge-road of a work-house, prepared by Messrs. W. Lister Newcombe, of Newcastle-on-Tyne, and Stephen Salter and Percy D. Adams, of London, joint architects, whose design was selected in competition by Mr. Charles Barry. The porter's office and quarters, the receiving wards, and the tramps' ward, placed at the end of site nearest the town, will constitute the entrance block, from which will run two roadways—one to the north front of the main building, the other to the south front of the infirmary. The main building will be recessed from 100ft. to 200ft. from the Woodbridge-road, and will consist of a central administrative block and two wings, one for women and the other for men. The administrative block will consist on the ground floor, on one side of the main entrance, of the committee-room and master's offices, and on the other, of the master's sitting-rooms, and on the upper floor of the other rooms for the master. At the rear of these will be the dining-hall, for 270; this will also be utilised as a chapel. The total accommodation provided will be—men 185, women 166, children 12, married couples 4, total 368.

**PERTH.**—The Municipal Buildings, which were partially destroyed by fire in January last year, have just been restored and reopened. The portion of the building chiefly affected by the fire was the council chamber and the police-court, which were completely gutted; but the basement floor, consisting of the chamberlain's and registrar's offices and the police office, were also rendered unfit for occupation. The work has been carried out by Mr. Heiton, city architect, upon plans following in every respect, so far as structural arrangements are concerned, those prepared by the late Mr. Andrew Heiton, the original architect for the building. The internal arrangement of the police office has been rendered much more convenient for the transaction of business. Adjoining buildings purchased by the Police Commissioners for about £2,000 have been transformed into a suite of offices from plans prepared by the burgh surveyor, Mr. McKillop. The upper floor of the new building has been divided into dwelling-houses for the superintendent of fire brigade and the caretakers. The second floor is mainly occupied by the offices of burgh surveyor. The basement is occupied partly by the offices of the gas treasurer, and partly by the fire brigade department. The cost of the restoration of the old portion of the Municipal Buildings has been about £3,000, and of the alterations on the building acquired for other offices about £1,000. The town council decided on Monday to erect a free library, at an estimated cost of £13,000.

**ROTHWELL, NORTHAMPTONSHIRE.**—Captain Tibbitts, on behalf of the urban district council of Rothwell, formally opened, on the 19th inst., a free library, reading-room, and district council offices, in a building in the centre of the town, the erection of which was commenced more than 300 years ago, but was not completed until last week. The original builder was Sir Thomas Tresham, appointed by Queen Mary the last Prior of the re-erected Order of Knights Hospitallars of St. John of Jerusalem. The Rothwell erection was intended for a market-place on the ground floor, and an assembly-hall above. The building, however, never reached the roof. The floors disappeared ages ago, and for 300 years the place has been simply the playground of children, save that the circular stone staircase has been used as the local lock-up. Captain Tibbitts, the Lord of the Manor, transferred his manorial rights in the site and building to the council, who have spent nearly £1,000 in transforming it, from plans by Mr. J. Alfred Gotch, F.S.A., of Kettering, into a library and reading-room. The contractor was Mr. J. Cheal, also of Kettering. A sketch of the incomplete Market House, by Mr. J. A. Gotch, was given in the BUILDING NEWS for Aug. 4, 1882.

**WHITTINGHAM, N.B.**—At present extensive alterations are in progress at Whittingham

House, the property of the Right Hon. A. J. Balfour, M.P. The Lauderdale bedroom has been reconstructed, a passage being taken off to facilitate attendance. The main corridor of the house is to be extended beyond the original building, and supported by strong steel girders. This extension provides a more desirable entrance to the north-east wing. The extended corridor is constructed of oak wood, with glass sides and roof, with a parapet of ashlar, fitted with shelves for the reception of plants, &c., which should materially enhance its appearance. It is also proposed to reconstruct the stable offices and courtyard, the present internal arrangements to be entirely discarded, and modern stable fittings introduced, with improvements in the loose boxes, &c. Mr. Farquharson, Haddington, the estate architect, has prepared the plans, and has been entrusted with the execution of the work. Mr. Farquharson has also received instructions to prepare a complete set of plans and elevations of the present mansion house, with a view to further additions and alterations.

**STAFFORD.**—The new technical instruction schools, erected in Victoria-square and East-street, Stafford, by the Staffordshire County Council, are ready for occupation. The buildings comprise offices and meeting rooms for the technical instruction committee, art and science classrooms, laboratories, and cookery kitchen. The style is Classic, after the Tuscan order. The premises are two stories high, having facades of red brick with Hollington stone dressings, of about 90ft., whilst in Earl-street the frontage extends for a total length of 85ft. The entrance hall leads to the committee-room, measuring 28ft. by 18ft., and suite of offices. The cookery kitchen, 30ft. by 20ft. by 13ft., will also be used for laundry-work. The classrooms generally and the school portion of the building are finished with a salt-glazed brick dado, 4ft. 6in. high, with moulded rail, while above this the walls are of plain wire-cut bricks, and treated with washable distemper. The wood-working shop is 28ft. by 20ft. by 10ft., and eight double benches are provided. In the basement there is a cookery coal-store, a heating chamber, and three storerooms. The upper story of the building is approached by a two-flight staircase, leading to the museum, 60ft. by 20ft., where it is proposed to exhibit a collection of sanitary appliances, old and new, for the benefit of visitors. The remainder of the floor is arranged as art and science rooms. The building has been erected from the designs of Messrs. Bailey and McConnell, of Walsall; Mr. Henry Lovatt, of Wolverhampton, being the contractor. The lead-glazing is by Camm and Co., Smethwick; and the wrought-iron work by Brawn, of Birmingham.

### CHIPS.

Mr. Philip Morris, A.R.A., is lying in St. George's Hospital suffering from a serious internal complaint. He has just undergone an operation, and is now going on as well as can be expected.

The ratepayers of the parish of St. George the Martyr, Southwark, have decided by 2,664 votes against 850 to adopt the Public Libraries Act. The vote has been taken owing to an offer made by Mr. J. Passmore Edwards to erect a library at a cost of £5,000 in the event of the Act being adopted.

There has just been hung, as a loan, in the National Gallery of Scotland, at Edinburgh, a bust-portrait by Gainsborough of Miss Isabella Mylne, of Mylnfield, born 1763, who afterwards became Mrs. David Kinloch. The portrait is believed to have been painted two or three years before Gainsborough's death in 1788. The portrait, which has been lent for two years by Mr. C. Y. Kinloch, of Gourdie, has been hung in the Great Room, near Gainsborough's full-length portrait of the Hon. Mrs. Graham, of Redgorton. The Romney portrait of Mrs. Ker, Blackshields ("Pretty Fanny Bull"), hangs on the opposite wall.

The new technical school in Peel Park, Salford, opened by the Duke and Duchess of York on Wednesday, has been erected at a cost of £70,000, from the designs of Mr. Henry Lord, of Manchester, and is carried out in red brick and terracotta.

The Local Government Board have appointed Mr. James Green, F.S.I. (Weatherall and Green), arbitrator, under the London County Council (Tower Bridge Southern Approach) Act, 1895, for settling the values of properties within the improvement area on which a betterment rate is under the Act to attach. Mr. Green held a similar appointment from the Board under the Manchester Corporation Act, 1894, in which for the first time the much-vexed principle of betterment was dealt with.



## BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE eighteenth annual dinner of the Builders' Clerks' Benevolent Institution was held on Tuesday evening at the King's Hall, Holborn Restaurant. The President, Mr. Benjamin E. Nightingale, of the Albert Embankment, occupied the chair, and was supported by about 300 gentlemen, including Mr. Charles Wall, of Chelsea, who has just retired from office as president; Mr. Joseph Randall, a past-president; Messrs. A. Pennington, Leonard J. Maton, A. Ritchie, J.P., W. Downs, T. Stirling, jun.; Arthur and Walter Nightingale, C. Bussell, J. Nicholls, &c. The usual loyal and patriotic toasts were given from the chair, Major E. C. Roe, V.D. (Messrs. Geo. Trollope and Sons), responding for the "Navy, Army, and Reserve Forces" in a militant speech. In proposing the toast of the evening, "Continued Success and Prosperity to the Builders' Clerks' Benevolent Institution," the President earnestly commended the claims of this noble and deserving charity to the consideration not only of builders and builders' merchants, but more especially of the class sought to be benefited. The institution was, he said, well worthy of generous support on the ground not only of the good work effected, but the judgment brought to bear on its management, and the wonderful economy with which the funds were administered. Since the establishment of the fund in 1866 no less than £15,000 had been collected, out of which the committee had elected forty-two pensioners for life, three children were being educated at the Orphan Working School, and had also granted temporary relief to a large number of cases where men were in ill-health or had met with adverse circumstances. It was a noteworthy and encouraging fact that their expenditure on pensions had been steadily increasing concurrently with an equally regular decrease in the expenses of management. Their ordinary income last year was over £710, in addition to which they received the second half of the legacy of £250 by the late Mr. T. Robinson, bringing up the total for the year to over £840. They would be glad not only of subscriptions and donations, but also of further bequests, as these could be placed to capital account. In conclusion, he asked them to drink to the continued success of the Institution. The toast was heartily received. Mr. Robert Downs proposed the health of "The Architects and Surveyors," to which Mr. A. Pennington replied. That of "The Builders" was given by Mr. Leonard J. Maton, hon. solicitor to the institution, and was acknowledged by Mr. Joseph Randall, who urged that so deserving a charity ought to be supported not only by every builder in London, but also by every builders' clerk. Mr. Donald Campbell proposed "The Builders' Merchants," to which Mr. Alexander Ritchie, J.P. (Messrs. Macdowell, Stevens, and Co.) responded, observing that the builder owed much of his success to the staff by whom he was surrounded. The builders' merchant was also greatly indebted to the builders' clerk, and would, as a rule, far rather reply to the clear inquiry for a quotation and definite specification bearing the well-known signature of one in the employ of a building firm than to the officialism now becoming so rampant in the trade. There were several points on which he, and possibly some other builders' merchants, would like to have a little practical information from builders and their clerks. For instance, after 26 years' experience of business life in London he had not been able to discover what was the meaning of the words "prime cost." He had been besieged with inquiries on one and the same transaction from client, architect, quantity surveyor, clerk of works, the builder, his clerk, and foreman as to whether the discount was allowed in a quotation, and no one seemed able to explain what this mysterious item should be, nor to whom it belonged. Again, could anyone tell him what was the "best grey iron," and the exact shade it should possess? The builder's clerk needed to be, and undoubtedly was, one thoroughly trusted by all the varying interests he came in contact with—sober, quick, reliable, and fair-dealing alike to his employer, the client, architect, and builder, and therefore a charity benefiting his class deserved support from all who had transactions with him.

The secretary, Mr. H. J. Wheatley, read a long list of donations and subscriptions promised during the evening, including one of £25 from the president, and others of ten guineas each from the Institute of Builders, Messrs. John Aird and Sons, John Mowlem and Co., and

Joseph Randall; and of five guineas each from the Worshipful Carpenters' Company, Messrs. T. L. Green, Edward Grüning, F.R.I.B.A., B. J. Hudson, Sir William Lawrence (first president), T. M. Rickman, F.R.I.B.A., Geo. Trollope and Sons, C. Wall, and E. W. White; £5 from the Burham Brick, Lime, and Cement Co.; four guineas from Messrs. Macdowell, Stevens, and Co., and three guineas from Mr. W. R. Freeman, the total as announced by the chairman amounting to the gratifying sum of £300. Mr. Edwin Brooks (Messrs. Colls and Sons) proposed "The Past Presidents," mentioning that a practical illustration of the advantages to builders' clerks of becoming subscribers was shown at the last election of pensioners, when the widow of one of their earliest subscribers was elected on her first application, her majority of votes being raised by those allowed for each half-guinea given by her late husband. Their institution was not one for raising wages or reducing hours, but purely benevolent. With the toast was coupled the name of the ex-president, Mr. C. Wall, who, in replying, said he had, during his year of office, been pleased to note how well and economically its affairs were administered. He proposed the health of "The President," which was received with enthusiasm, and fittingly acknowledged from the chair. The remaining toast, "The Visitors," was proposed by Mr. F. S. Oldham, and responded to by Mr. W. T. Plume.

## OBITUARY.

M. EMILE BOESWILLWALD, of Paris, the eminent architect and archaeologist, died on Sunday at the age of 81 years. He was a native of Strassburg, was apprenticed to a stonemason, studied architecture under Labrousse and under Lassus, and joined the late M. Viollet-le-Duc in the restoration of Notre Dame. He succeeded Prosper Mérimée as one of the Inspectors-General of Historical Monuments of France, and designed churches at Pau, Biarritz, and Calais. Since 1875 he had been an honorary corresponding member of the Royal Institute of British Architects.

Mr. GEORGE RICHMOND, D.C.L., LL.D., retired Royal Academician, who died on Thursday in last week, within a week of completing his 87th year, will be best recollected by his portraits in crayon. The son of one artist and the father of another, he was a fellow student at the Academy schools with Sidney Cooper, now the *doyen* of landscapists. In 1831 he eloped with, and married at Gretna Green, Julia, daughter of the architect, Charles Heathcote Tatham, author of a work on "Classical Ornament." In 1846 Mr. Richmond was nominated by Mr. Gladstone to succeed Sir Augustus Callcott on the council of the Government Schools of Design, a post which he held for three years. About this time he adopted the use of oil-painting, and soon became well known for a large number of portraits in this material, many of which have been engraved. In 1856 he had been appointed a member of the Royal Commission for considering what should be the site for the National Gallery, when he was the only one who voted for its removal from Trafalgar-square to a site at Kensington-gore, Faraday refusing to vote. Mr. Gladstone pressed upon him the Directorship of the Gallery in 1871, and again in 1874, but without success. He became an Associate of the Academy in 1857, and a full Academician in 1866, and was placed on the retired list a few years since. About half a dozen of his pictures are in the National Portrait Gallery to be reopened next week, and he is also represented at the Bodleian Library and many collections, and by a monument to Bishop Blomfield in the south choir aisle in St. Paul's Cathedral (1865), and several busts, including those of Keble at Keble College, and of Dr. Pusey at Pusey House, Oxford. In 1871, when the Peel collection was offered to the nation, he was consulted as to the price that should be given for it, and named the same sum as that which was afterwards confirmed by professional valuers, and which was accepted by Sir Robert Peel's representatives. He took the greatest interest in the winter exhibition of Old Masters at Burlington House, and from 1869 until age compelled him to relinquish active work he gave much time and attention to obtaining pictures from private collections and to arranging them at Burlington House. Mr. Richmond was one of the original members of the hon. Associates class of the R.I.B.A., created in 1877, and is the third of

those then elected who has died within the last two months—the others being Lord Leighton and Mr. James Abernethy.

MR. JABEZ CHURCH, M.Inst.C.E., F.G.S., of Parliament-street, Westminster, who died on Friday at Holland Park-gardens, W., in his 51st year, has had for the past quarter of a century an extensive practice as a gas and water consulting engineer. Mr. Church was articled to his father, Mr. Jabez Church, sen., of Westminster, gas and water engineer. Upon completing his term of pupillage, Mr. Church entered into partnership with his father, and so continued until the death of the latter. He was engineer of, or professionally engaged for, a very large number of gas and water works, principally in Essex, his native county, including the gas undertakings at Braintree, Barking, Brentwood, Halstead, Clacton-on-Sea, Chelmsford, Enfield, Epping, Harwich, Ilford, and Saffron Walden; the water and drainage works at Witham in the same county, and the waterworks at Thetford and Cromer, Norfolk. Besides these, he was engaged for the Barnet gas and waterworks, the Colney Hatch gasworks, the Dublin Consumers' gasworks, the Horley gasworks, the Woking gasworks, and the Godalming waterworks. Mr. Church was also the consulting engineer for no fewer than twelve waterworks, which he designed and erected, and chief amongst these are those at Henley-on-Thames, Great Marlow, Barton-on-Humber, and Goring, and the Mid-Sussex Waterworks. He was a past-president of the Society of Engineers, having been elected to that office two years in succession—namely, in 1882 and 1883. His father had enjoyed that distinction in 1872 and 1873.

WE have to announce the death of Mr. GEORGE HACKFORD, F.S.I., of No. 6, Queen Anne's-gate, S.W., which occurred on the 25th inst., at Wandsworth, in the 71st year of his age. Mr. Hackford was born at Boston, in Lincolnshire, and, early in life, entered the office of Messrs. Kirk and Parry, of Seaford, and ultimately became their travelling manager. For the last 35 years, Mr. Hackford, at Queen Anne's-gate, acquired a large practice as a quantity surveyor, very largely in connection with the Great Western Railway Company, and with other railway companies. One of the departments of his business, in which Mr. Hackford's loss will be most deeply regretted, is the important duty of arbitrator, which he so frequently undertook, in all questions relating to contracting disputes.

A three-light memorial window has just been placed at the east end of Linthwaite Church, Huddersfield. The left-hand light, which contains subjects of the "Annunciation" and "Resurrection," has been given by Mr. Eli Mallinson and his family, well-known Wesleyans in the district. The centre light contains subjects of the "Crucifixion," the "Last Supper," and "Christ in Majesty," and has been given by the family of the late Mr. James Quarby, of Linthwaite, in memory of their father and his daughter. The right-hand light has been given by Mr. H. Schofield and his sister Laura, and contains subjects of the "Ascension" and the "Birth of Christ." The window has cost about £150. Messrs. Powell Brothers, of Park-square, Leeds, are the artists.

Sir W. H. Wills, Bart., M.P., has undertaken the restoration of the tower of Blagdon Church, and the work is to be carried out as a memorial to the late Lady Wills. The tower, which is of the usual Somerset type, has fallen into decay. Sir William Wills has had a report prepared by Mr. Frank Wills, architect, of Bristol, and, by permission of the rector and churchwardens, has instructed Messrs. Cowlin and Son to restore the upper portion of the tower, and to re-erect the pinnacles which have been removed or fallen into decay. The work will entail an expenditure of about £600. The work will be put in hand soon after Easter.

The foundation-stone of a new Liberal Club for the South Ward of Leeds was laid the other afternoon by Sir John Barran, Bart., on a site between Norfolk-street and Gloucester-street. Plans have been prepared by Mr. Windsor Thorp, architect, of Leeds. Built of brick, with stone dressings, the premises will be two stories high, with a cottage at one end for the caretaker. On the ground floor there will be a billiard-room, 51ft. 6in. by 30ft., with three tables; a smoke-room, 27ft. 6in. by 23ft.; a room for games, 26ft. by 16ft., and a reading-room, 18ft. by 15ft. In the centre there will be a hall, 32ft. long by 18ft. wide, and here the bar will be located. The basement will contain a kitchen, a bath-room, cellars, and an apartment for the heating apparatus. A large assembly hall will occupy the whole of the second floor. The cost of the building (exclusive of fittings) is £2,600.



## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**  
—The annual meeting of this society took place on Monday evening in the Mechanics' Institution, Cookridge-street, Leeds, Mr. E. J. Dodgshun presiding. The officers were elected for the ensuing year as follows:—President, Mr. Wm. Watson, Wakefield; vice-presidents, Mr. W. W. S. Braithwaite and Mr. W. A. Hobson; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. W. H. Beevers; hon. secretary, Mr. F. W. Bedford; hon. auditors, Mr. L. S. Dodgshun and Mr. M. F. Musto; council, Mr. H. B. Buckley, Mr. Carby Hall, Mr. Jas. Ledingham (Bradford), Mr. Butler Wilson, Mr. C. B. Howdill, and Mr. G. F. Danby. Mr. Francis W. Bedford submitted the annual report, showing that the number of members was 110, as against 108 last year. This, together with a satisfactory statement of accounts, read by Mr. Thorp, hon. treasurer, was adopted, on the motion of the chairman. Mr. Thorp said the council had that afternoon considered proposals for the laying out of City-square, certain plans and suggestions having been submitted by members.

### CHIPS.

Mr. Charles Abbott, builder and contractor, of Keswick, died on the 16th inst., aged 56 years.

At Aberdeen, on Friday, the presentation took place of the portrait of Dr. David Stewart, of Banchory, ex-Lord Provost of the city, painted by Mr. W. Q. Orchardson, R.A. The painting will be hung in the town hall of the city, which already contains four pictures by Sir George Reid, P.R.S.A., two by Philip, and one each by Pickersgill, Kneller, and Lawrence.

The urban district council of Llandudno recently formulated a new code of building by-laws and regulations. At the last meeting of the council it was reported that no objections to the draft code had been offered by the local architects and builders, and it was therefore decided to formally adopt them.

The pavilion on the county cricket-ground at Bristol is being enlarged and partially reconstructed. Mr. J. Hart, of Bristol, is the architect, and Mr. Humphrey, of the same city, is the contractor.

The famous picture by Hans Holbein, belonging to the Barbers-Surgeons Company, will be exhibited in the Guildhall Art Gallery during the forthcoming loan exhibition of pictures. The collection, which will consist of some 150 pictures drawn from many of the most celebrated public and private collections in the country, will be opened to the public on Tuesday, April 21.

At St. Bartholomew's, Bolton, the new tower and four bells, the gift of the late Rev. Richard Loxham, are now completed, and the Bishop of Manchester has promised to dedicate them on Monday next.

Mr. Rienzi Walton, C.E., Local Government Board inspector, attended on Friday at the town hall, Tadmorden, to receive evidence in regard to an application by the urban council to borrow £40,000 for sewerage and sewage disposal. Mr. Shaw, the surveyor, explained the proposals.

The foundation-stone was laid at Walker-on-Tyne last week of a new Sunday school and parish hall, which is to be built on a piece of leasehold land adjoining the parish church. The school, which will be of brick, with stone facings, will have a length of 90ft. by 36ft., and will contain two classrooms 17ft. by 16ft., and two schoolrooms 70ft. by 34ft. The architects are Messrs. Hicks and Charlewood, of Newcastle; and the contractor, Mr. Thomas Watson, of Walker. The estimated cost is £1,600.

A new county police-station is about to be built at Newquay, from plans by Mr. Oliver Caldwell, F.R.I.B.A., of Victoria-square, Penzance.

It is proposed to rebuild the nave of the parish church of St. Mary, Chatham, a prominently unsightly edifice in the "Lines," from plans by Sir Arthur Blomfield, A.R.A. The cost, including a new tower and spire, is about £8,000, of which the first £1,000 has been promised. The chancel was reconstructed between 1884 and 1888 at a cost of £4,500, all of which has been paid off.

The Rochester Town Council have under consideration a scheme by Mr. Baldwin Latham for dealing with storm-water drainage at Strood.

The health committee of the St. Helen's Corporation have approved amended plans by Mr. J. C. Broom, the borough surveyor, for the erection of a new pavilion to accommodate 24 beds, with additions to the administrative block, at the Infectious Diseases Hospital, and the town clerk has been instructed to apply for sanction to borrow £6,500 to cover the estimated cost.

## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not infrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLVII., LI., LIII., LIV., LVII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

## GOOD FRIDAY.

The next number of this journal will be published on THURSDAY, April 2, the following day being Good Friday. All Advertisements must therefore reach the Office by FIVE p.m. on WEDNESDAY NEXT to secure insertion.

RECEIVED.—N. F. Beesley.—B. W. E.—Chas. Wingrave. R. T. and Co.—C. E. (Oxford).—C. E. and R. E. Co.

ASSISTANT. (A less strongly-worded letter, with real name and address, would be inserted; but it is of no use appealing anonymously for such a society as you advocate. There is a good deal in what you say; but it has been tried before, and failed. There is no solidarity among architects' assistants.)

## "BUILDING NEWS" DESIGNING CLUB.

C. B. ANDREW. (The subjects are published every month in the BUILDING NEWS during the session between October and June. Correspondents would save themselves and us much trouble if, instead of writing to us, they would read their copies of the BUILDING NEWS a little more carefully. The current subject appeared on p. 401, in our issue for March the 13th.)—JOHN S. BROWNIDGE. (Read the particulars and rules of the Club published by us on October 18th, 1895.)

## Correspondence.

### BRICKS.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Ruskin, in "The Stones of Venice," when describing the terracottas of Northern Italy, complains of the lack of knowledge in this country "of the real use of bricks"; and though this charge could hardly be reiterated to-day, yet a somewhat similar charge is made against the profession in a paper on "Bricks" submitted to the Society of Architects by Mr. Montgomery on the 17th inst.,—viz., an ignorance of bricks as a building material, coupled with an indifference so long as they (architects) get what they specify.

Assuming for the moment that the statement is correct (though I do not indorse it in its general application), it affords a strong argument in favour of the continuance of the recent innovation of the Architectural Association in admitting operative workmen and others to the reading of papers, and the discussions ensuing thereon, on materials and workmanship peculiar to their respective trades—an innovation which is calculated to be productive of beneficial and educative

results alike to operatives and to the profession. My own experience of the vexed question, "Fletton bricks v. stocks," will be found in a series of articles in the BUILDING NEWS of 1892, under the heading "Bricks and Joints in Brick-work." The craze in glazed bricks is often caused by cold air getting into the kiln in the process of cooling, or by drawing the bricks from the kiln before they have sufficiently cooled. The chief and recommending characteristic of salt-glazed bricks seems to have been overlooked both by the writer of the paper and the speakers—viz., non-susceptibility to craze or flake, which make them eminently suited for dadoes, or where likely to have rough usage, in preference to bricks glazed by dipping.—I am, &c., FRANK WALKER.

## Intercommunication.

### QUESTIONS.

[11488].—Staining White Wood.—"Amateur" wishes to know the best way of staining white wood for furniture purposes.—AMATEUR.

[11489].—Filtering.—In town's water and sewage, sand and gravel filters, how many gallons per diem respectively should each square foot of area filter satisfactorily?—R.

[11490].—Wood-Pulp "Tiles."—I have had an inquiry from a friend in Smyrna as to "wood-pulp 'tiles' or 'slates.'" He says he understands that they do not burn and are unbreakable in transport, and, of course, much lighter in weight than ordinary tiles or slates. Can anyone tell me anything about them?—M.

[11491].—Concrete.—I am proposing to lay 9in. of good Portland cement concrete between 7 by 4 steel joists, 2ft. 6in. apart and 11ft. long. What distributed load would it take to break concrete, and what books could I look up that would give me the required information? Would it add to the strength of concrete if laid on wood centres?—STUDENT.

[11492].—Flue and Chimney.—How long can an underground flue from a 30H.P. boiler be from a chimney-stack 80ft. in height? What size should the underground flue be? How are soot-doors arranged? What difference would there be in length and size of flue, &c., if there be two 30H.P. engines, the stack being the same height? Is there any book giving this sort of information? What length of shafting (in one length) could be worked by a engine driven by a 30H.P. boiler, and what length if there be two 30H.P. boilers?—there being small machines at intervals worked by bands from the shafting? What would be the power at the end of such shaft?—F. G. C.

[11493].—Tank.—Is it possible for the stone walls of a tank 27in. thick, and rendered with 1in. of Portland cement on the inside, to expand under pressure when tank is full of water, and cause a leakage, and to contract when tank is emptied to their original position, and no cracks or settlement to be visible to the eye on the face of the cement rendering?—W. F. T.

The foundation-stone of the new County Council buildings at Durham city will be laid by the Earl of Durham on Saturday, April 25.

A Young Men's Christian Association Institute at Sevenoaks, situate at the junction of High-street and Bank-street, on the site of the old corn-market, was opened on Wednesday week. The structural alterations have been carried out by Messrs. Wiltshire and Son, of Sevenoaks, under the supervision of Mr. Potter, architect.

A new science wing, which has been added to the Training College at Darlington, from plans by Mr. Pritchett, of that town, was formally opened on Friday. The cost of the extension has been £1,400.

New board schools at Reformatory-road, Two Mile-hill, near Bristol, are approaching completion. The architect, Mr. Mackay, of Kingswood, has designed the schools on the class-room system. The schools accommodate over 1,200 children, and are built on the summit of Two Mile-hill, St. George. Mr. Bryant is the contractor.

Mr. Hedley, valuer, is claiming 600 guineas against the Cardiff Corporation for services rendered in connection with the Harbour Trust Scheme.

The Red House Tavern, Woking, is being enlarged by the addition of a saloon bar, coffee-room, and billiard-room. Mr. R. Clamp, of Woking, is the architect.

Mr. Thos. Davis, surveyor, was summoned before the Newport, Mon., county magistrates, on Saturday, for neglecting to pay £8 10s. 8d. to the Newport Highway Board, under which he was formerly surveyor. An order was made for the payment of the full amount, or, in default, 21 days' imprisonment.

In the ventilation of the large hall now being added to the Queen's Hotel, Helensburgh, by Mr. B. Buck, architect, Glasgow, the ventilation is being specially looked after, and carried out by means of Cousland and Mackay's "Climax" patent direct-acting continuous exhaust ventilators of an ornamental design.



## Legal.

### OLD AND NEW STREETS.

THE struggle over the building line when applied to ground formerly covered with houses, and since made part of a new street, often comes up again in our courts. The latest case is that of the "London County Council v. Pryor" (*Times*, March 4), which is also of importance, because in it the older case of "Lord Auckland v. Westminster District Board" (L.R. 7, ch. 597) was considered and distinguished. In the recent case the dispute arose over some old houses in the Stoke Newington-road, which had been taken to form a new street called the Prince George's-road, entering the old one at right angles. The main question was whether the owner could claim to be paid compensation under section 74 of the Metropolitan Management Act, 1862, for setting back his building to the general building line of the new road, or whether it was within section 75 of the same statute, when an order for its demolition, as far as it went beyond the certified building-line, might be made. The magistrate thought the case came within the earlier authority above quoted, and so refused to make an order. The Divisional Court reserved their ruling, and now the Court of Appeal has done the same, so that the case goes back to the magistrate.

The Master of the Rolls said that a new street had been made to join the old one at right angles. In the new street there were some old buildings, but beyond these there were enough new houses to enable the surveyor to determine a building-line. He did so, and it was then found that one of the old houses stood beyond it. This had since been pulled down, and now the owner claimed to build not only upon the site of the old house itself, but also upon the garden ground on each side of it, although these new houses would come out beyond the building-line. For the Council, it was urged that the owner had abandoned the old house by pulling it down, and that he had thrown the site into the street, which had become an absolutely new street, so that if he built he must conform to the building-line. This view was now adopted by the Court of Appeal, and it was stated that in the earlier authority above quoted the land built upon was part of the curtilage, and therefore in law part of the house itself; while in this case the land was only portion of the garden, which the Court held was a very different thing.

FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

The formal opening of the railway between Coolgardie and Perth, W.A., took place on Monday. Messrs. Willie Brothers, the contractors, finished the work three months before the stipulated date.

At Tuesday's meeting of the London County Council the recommendation of the Public Health and Housing Committee for the sale for £2,150 to the East-end Dwellings Company, of the land acquired under the Ann-street, Poplar, improvement scheme, was, after a long controversy, adopted. The committee further proposed to expend £18,300 on the erection of artisans' dwellings in Green-street and Gun-street, Southwark, and this was agreed to without discussion.

Mr. G. W. Willcocks and Dr. T. Thomson, inspectors of the Local Government Board, resumed in the Council Chamber of Leeds Town Hall on Wednesday, Thursday, and Friday in last week their inquiry into the application of the corporation for powers to deal with the insanitary area situate in the district of York-street and March-lane, East Leeds, under the Housing of the Working Act, 1890. The principal witness on behalf of the corporation was Mr. Thomas Hewson, M.I.C.E., the city engineer.

At the meeting on Friday of the East of Scotland Engineering Association, held in 5, St. Andrew-square, Edinburgh, the president, Mr. William Simpkins, B.Sc., in the chair, Mr. John Young, C.E., read a paper on "The Design and Construction of Tall Chimney Shafts," in which he discussed the draught power in chimneys, and pointed out the prominent defects in draught frequently found in chimneys. He also discussed the forces to be contended with in building chimneys, the best manner to resist them, and the question of foundations and provision for heat.

### LEGAL INTELLIGENCE.

SEQUEL TO A SINGULAR CONTRACT.—The case of Booth v. Chapman was heard at the Manchester Winter Assizes, Crown Court, on Thursday and Friday in last week, before Mr. Justice Vaughan Williams and a jury. Robert Henry Booth, builder, Stalybridge, claimed from George Chapman, a spinner, Bennett-street, Newton, the sum of £165, the difference between the contract price of some work which he had done for the defendant, which was £425, and the sums paid on account of the contract, £260. He also claimed £70 damages for alleged fraudulent misrepresentation by the defendant, he alleging that the defendant had informed him that he had received a tender of £425 for the erection of two houses at Newton, whereas the lowest tender was £495. The defendant, whilst denying any fraudulent misrepresentation, made a counterclaim of £194, being the amount he had paid to make good the defective work and materials of the plaintiff, and the amount expended in completing the work which the plaintiff had left unfinished. Plaintiff's counsel explained that the lowest tender was thought to be £425, and having perfect good faith in the defendant, the plaintiff signed a contract to do the work for £415, the agreement being that the work should be done for £10 less than the lowest tender received. The tender for £425 was rescinded three days after, and the next one was £495, so that the price which the plaintiff should have had for doing the work was £485. There was a certain amount of work not completed, for which was allowed £20, and that, with the amount the plaintiff had received, left £242 7s. 11d. due to him.—The jury asked if the order was given to the plaintiff before the withdrawal of the £425 tender?—The Judge said he understood that the order was not given until after the tender had been withdrawn. Plaintiff's counsel added that the bargain that he should do it for £10 below the lowest tender sent in was a word-of-mouth bargain. There were the usual specifications, &c., and the houses were to be finished by December 5th. The defendant complained that the plaintiff did not put in proper materials, did not finish the work properly, and did not do it soon enough, so somebody else finished the work at a cost of £194 8s. 4d. While the work was going on, the defendant was always putting off paying him, and got Mr. Lockwood to go over the works to see what the plaintiff was entitled to. He assessed it at £110, and in May, 1895, plaintiff was paid £60, he having previously received £200. The plaintiff was then called, and said the bargain was closed on a Sunday, the defendant saying he had got a tender for £425. Plaintiff asked if it was a *bona fide* tender, and the defendant said it was. He asked whose tender it was, and the defendant said a man named Warrington. He eventually signed the contract in the evening of the same Sunday for £415. He denied that he had unnecessarily delayed the work while in progress; but when they had been going on for about six months defendant took it out of his hands. The case being here closed, the Judge asked some of the jurymen to examine some doors which had been brought into court as specimens of the plaintiff's alleged bad workmanship. He thought that, although they were not first-class doors, they were average ones. The doors and a drawer were exhibited to the jurymen, who examined them. One of the jurymen said they were not well-made doors, and were of inferior quality. The Judge, in summing up, said the jury having asked him to assess the amount due on either side, he should hold that it was a mistake to take the Warrington tender as the lowest one, and his view was that the tender having been withdrawn before the time had elapsed for tenders to be sent in, and, in fact, before the order was given to the builder, they must take the next one, the £495 tender, as being the lowest. That was a difference of £70, so he began by crediting the plaintiff with the £70. The plaintiff said he had done extras, for which he should allow another £37, making £107. On the other hand, he had not a shadow of a doubt that the plaintiff suspended the work, and unjustifiably delayed it. To debit him with £24 for the delay was certainly not overcharging him. He should also allow defendant £90 for bad workmanship, making £114, which left a balance in favour of defendant of £7. The above was, however, on the assumption that the whole of the contract price was to be paid to the plaintiff. He was entitled to £155, less £5, which made him entitled to £150. He would not allow costs in either case. Verdict accordingly for the plaintiff for £150, without costs.

GREEN-STREET, LEICESTER-SQUARE, IMPROVEMENT.—An inquiry was held on Friday at the Clerkenwell Sessions House, before Mr. Loveland Loveland and a jury summoned under Michael Angelo Taylor's Act, to decide what compensation should be paid by the Vestry of St. Martin-in-the-Fields to the owners of 34, Leicester-square for a portion (about one-fourth) of that house (containing 840 superficial feet), to be acquired by the vestry for the purpose of their widening scheme. Evidence was given that the house had been let since 1881

until recently at £120 per annum, and that £4,500 had been offered for the premises. Alderman Sir J. Whittaker Ellis, Bart., was examined for the owners in support of a claim of £2,370, which was further supported by Mr. C. J. Shoppee and Mr. James Green. On behalf of the vestry Mr. Galsworthy gave evidence that £500 would be the full compensation, and this view was supported by Mr. Robson and Mr. Thurgood, who considered that the owners would have an improved frontage to the street and square. The jury eventually awarded the owners £1,400, being £350 above the £1,050 mentioned in the vestry's sealed offer.

IS A TENT A BUILDING?—The Kingston-on-Thames magistrates gave, on March 18, their decision in a case which has excited a great deal of interest in the borough. Mr. Thomas Harrison, a cheap-jack travelling auctioneer, was summoned by the Corporation of Kingston for having erected a building without giving the necessary notice to the town council, submitting plans, and constructing it of proper materials; also for having erected it beyond the building line, and, further, for allowing it to be used as a place of public resort without the certificate of the borough surveyor. The facts were gone into last week, when it was stated that the defendant had erected a building consisting of two caravans, in front of which was a large canvas marquee, 50ft. by 40ft., fastened to the ground by long iron spikes. It was lighted by naked gas-jets, the floor was of loose boards, and smoking was allowed in it. The Corporation contended that this was a building within the meaning of the Public Health Act and the Corporation by-laws. On the other hand, the defendant's counsel argued that it could not be considered a building, and, therefore, did not come within the Act. Several cases were cited in support of the contention, and the Bench, having taken a week to consider the matter, came to the conclusion that the erection was not a building within the meaning of the Public Health Act and the Corporation By-laws; but that it came within the definition of a building under the Kingston Improvement Act. The first two summonses were dismissed, and on the third the magistrates imposed a fine of 1s. and costs.

OLD PALACE YARD ARBITRATION.—Mr. Farmer, the umpire in the case of Messrs. Gedge, Kirby, and Millett against Her Majesty's Commissioners of Works, has given his award. The claim was for the taking of Messrs. Gedge and Co.'s offices in Old Palace-yard, so as to open out the view of Poets'-corner and the Chapter House. The Government had offered £4,000 compensation. The award is for £6,295.

### CHIPS.

At the Guildhall, Rochester, last week, Colonel J. T. Marsh, R.E., the inspector appointed by the Local Government Board, held an inquiry as to an application by the Rochester Town Council to the Local Government Board for permission to borrow the sum of £1,188 for the purchase of property for the improvement of the Corn Exchange, and £1,570 for street improvements. The application was unopposed.

In the application for discharge from bankruptcy made on behalf of William John Campbell, of Hollywood-road, South Kensington, the discharge has been suspended for three years, ending Feb. 20, 1899.

Mr. F. C. Penrose, F.R.S., P.R.I.B.A., has been unanimously elected a corresponding member of the Central Society of French Architects.

About nineteen miles of railway on the Barry Dock and Railway Company's service connecting Barry with the populous Rhondda Valley in Glamorgan-shire, was opened to passenger traffic last week. The new line will serve as a short route between Pontypridd and the sea coast.

The question of the beach sewage outfall was again before Lowestoft Town Council on Wednesday week. The lowest tender for the proposed new works, 40ft north of the existing outfall, was that of Mr. J. F. W. Bray for £8,486, and the committee recommended that it be accepted subject to the sanction of the Local Government Board being given to a loan. Mr. Capps proposed that the position of the new outfall be altered to about 120 yards south of the present valve chamber. This was defeated. A proposal to adjourn the consideration of the plans was defeated by 13 to 11, and ultimately the recommendation of the committee was adopted.

It has been reported to the Birmingham City Council that the whole of the properties on the Milk-street improvement area have been acquired. The ground, measuring about 4,000 yards, had seventy-two houses upon it. These having been cleared away, the next step will be to offer the land for sale for the express purpose of erecting artisans' dwellings of a type to be approved by the Local Government Board. If no purchaser can be found under these conditions, the council will have to consider whether they themselves will build.



## PARLIAMENTARY NOTES.

**THE IMPROVEMENTS IN OLD PALACE YARD.**—Mr. John Ellis asked the First Commissioner of Works, on Friday, why there were no workmen now at work on the ground near Henry VII.'s Chapel, completing the clearance already begun; and whether the work could be vigorously pushed forward, the space turfed and fenced in, so that the public might have the earliest possible advantage of the vista of the chapel, Chapter-house, and Abbey there newly opened out. Mr. Akers-Douglas replied that workmen had been steadily at work breaking in and filling up the old cellars on the ground in question. This was necessary preliminary work. Before any conspicuous progress could be made it was necessary to obtain the consent of the Dean and Chapter of Westminster to certain proposed alterations. He was glad to add that, at a chapter held on Monday last, consent was given to pulling down the wall, the property of the Dean and Chapter, which now spoiled the view of the Chapter-house. The Dean and Chapter had also agreed to the removal of the iron railing from the south of Henry VII.'s Chapel, for the purpose of placing it along the front of Palace-yard. This would add very materially to the appearance of the space, which would be turfed and laid out as soon as the ground could be prepared for that purpose. The work would now be pushed forward as rapidly as possible, and every effort made to get this open space into order before the summer months.

**LONDON WATER SUPPLY.**—In the House of Commons on Tuesday the first of the eight Bills promoted by the London County Council for the transfer of the London water undertakings to themselves and other county councils within the water companies' areas came up for second reading. The Bill was rejected by a majority of 162—287 to 125 votes—on the ground that the measure was unnecessary in view of the action of the Government in introducing a Bill to deal with the whole Metropolitan water question. The remaining Bills promoted by the London County Council were all rejected without a division. Three Bills promoted by the water companies were read a first and second time, a Select Committee being appointed to consider them, with instructions that no additional powers were to be granted except for works which could not be postponed.

**THE PUBLIC HEALTH (SCOTLAND) BILLS.**—Following the Bill for the amending of the public health laws in Scotland, the Bill (No. 2) for consolidating the law was published on Monday night. The Bill proposes to repeal the Public Health (Scotland) Acts of 1867, 1871, 1875, 1882, and 1890. It does not propose to repeal the Public Health (Scotland) Act of 1891, or to include its provisions, which are mainly of local interest, in the consolidation. Further, it leaves untouched the sanitary provisions of the Burgh Police (Scotland) Act, 1892. The provision of water supply in burghs will depend entirely on the powers conferred by the last-mentioned Act or by the local Acts which have been obtained by various burghs.

**PEMBROKE DOCKYARD.**—Mr. Goschen stated, on Tuesday, that the Admiralty have determined to carry out the plan for building a jetty at Pembroke Dockyard which was discussed in the last Parliament. The cost will be between £80,000 and £90,000. Progress will be made with the work in the course of the coming financial year.

## CHIPS.

In the Crown Court of Assizes at Birmingham, on Friday, Justice Mathew decided that George Crouch, builder, Hockley, was entitled to succeed in his claim for extras against William Fairbairn, of Aston. The verdict was for £194 6s.

The new extensions to the Westminster Union Workhouse are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A general assembly of the Royal Scottish Academy was held on Wednesday week, when the following four painters were elected to the rank of Associates:—J. Thorburn Ross, of Edinburgh, R. Payton Reid, North Queensferry, Fifeshire; James Paterson, Moniaive, Dumfriesshire; and Wellwood Rattray, of Glasgow. All four are landscape painters, Messrs. Ross and Reid combining figures with scenery, and Mr. Rattray being best known for his coast views. The following was the final vote:—Mr. Ross, 25; Mr. Reid, 24; Mr. Patterson, 22; and Mr. Rattray, 20. Mr. W. J. McGregor, Glasgow, came next with 15 votes.

Alterations are being made to the police-court, Brynmawr, embracing the ventilation, which is now being carried out on the Boyle system.

The Liverpool Overhead Railway, which was opened in February, 1893, by the Marquis of Salisbury, is about to be lengthened by the southern extension, which includes a viaduct and tunnel works, and will be inaugurated at Easter.

## WATER SUPPLY AND SANITARY MATTERS.

**CLARE MARKET IMPROVEMENT SCHEME.**—Mr. H. T. Steward, Home Office Inspector, concluded his inquiry on Saturday into the scheme prepared by the London County Council under the Housing of the Working Classes Act for clearing a large area in Clare Market declared insanitary by the medical officer of health. On Friday, Mr. Elwin, chief of the Engineers' Department of the London County Council, stated that the Council had agreed with the Strand District Board of Works for the widening of Blackmoor-street to be extended northwards to the extent of 40ft., and also for a similar widening of Clare-street in a southerly direction. This would increase the area to be dealt with by 70,000ft. Mr. Andrews, clerk of the Strand District Board of Works, complained that the County Council had not provided for rehousing a sufficient number of the displaced persons on the cleared area. The total area covered by the scheme was 230,000ft., and for the purposes of rehousing, the Council proposed to deal with only 31,600ft. The gross cost of the scheme was £381,400, and, estimating that the whole area was devoted to housing the working classes, the recoupment would be 4s. in the pound, or a total recoupment of £76,280, leaving the net cost a little over £300,000. Evidence was also called on behalf of a number of tenants and owners of property who object to the scheme. Mr. Sims, a surveyor, spoke to the state of certain houses which had been condemned, and suggested that they had not been so condemned on account of their insanitary condition, but in order to complete a scheme for dealing with the area as a whole. Mr. Collard gave evidence on behalf of Sir J. Hutton, the owner of certain property in New Church-court, Strand, which was scheduled. The owner denied that the houses were insanitary, and asked to have them excluded from the scheme. Mr. Wolton, engineer to the Metropolitan Electric Supply Company, was examined with regard to the effect that the carrying out of the scheme would have upon the mains of the company in the district. The chief engineer to the Gas Light and Coke Company pointed out that if the scheme were carried out a great many of his company's mains would be affected, and a large number of them rendered useless. The inquiry then concluded, and the inspector intimated that before presenting his report he would take the opportunity of viewing the premises scheduled in the scheme.

**LANCASTER.**—An inquiry was held at Lancaster on Friday by Colonel Durnford, R.E., of the Local Government Board, into an application of the Lancaster Corporation to borrow £65,000 for the construction of a storage reservoir at Blea Tarn. Mr. Cook, the borough water engineer, explained the scheme, showing the suitability of the Blea Tarn site as a reservoir to hold 100,000,000 gallons, which would serve not only as a storage, but as a service reservoir. It was necessary to store water now, because for thirty-three consecutive nights in a dry season the water had been shut off from the town, whilst at other times water was running to waste. Mr. Strachan, assistant to Mr. Mansergh, C.E., commended the Lancaster scheme, and dealt with the suggestion of the Local Government Board. He said that the cost of the Manchester water would be a fraction less than 9d. per thousand gallons, and the level of their line of pipes would necessitate the construction of a reservoir for storage, as well as a line of pipes in addition to those already existing to get the water to the town. This would involve a capital outlay of £30,000, in addition to the 9d. per gallon. The Lancaster Corporation, under their scheme, could supply water at 6d. per thousand gallons. The inspector said if a storage reservoir was required for the Thirlmere water, it put an end to the Manchester case. The inquiry was concluded.

The late Mr. George Mence-Smith, oil and colour merchant, has bequeathed the oil painting, "Choosing a Deity," by the late Edwin Long, R.A., to the Company of Painters.

The Manchester New College, built from plans by Mr. Thomas Worthington, of Manchester, is to be embellished by a fine series of windows designed by Sir Edward Burne-Jones, and executed by Messrs. William Morris and Co. The last series fixed is that of the famous "Days of Creation." This work has been executed in pictorial form, but was originally designed for glass.

Lord Portman has recently built himself a new house at Bryanstone, Dorsetshire, and has now decided to pull down the interesting old mansion there, the stone of which is to be used for the construction of a church on the same site.

At the Orphan Asylum, Wolverhampton, on Wednesday, the Bishop of Shrewsbury dedicated an organ and brass altar rails which have been presented to the chapel. The organ has been built by Messrs. Nicholson and Lord, of Walsall. It consists of two manuals and a pedal organ, and is inclosed in a case of unpolished oak, richly carved.

## Our Office Table.

The appeal recently addressed by the President of the Architects' Benevolent Society, Mr. Penrose, to the architectural profession of the United Kingdom, directing attention to the good work done by the society, and the urgency for more liberal support from architects at large than has hitherto been accorded to it, has met with a liberal response; although it may be hoped that the effect of Mr. Penrose's forcible letter is not yet exhausted, and that further contributions will be received by the society. Many new annual subscribers have been added to the list of members, and others, already subscribers, have responded to the appeal by increasing their subscriptions. Notwithstanding the fact that it was more particularly Mr. Penrose's desire to increase the amount of annual subscriptions, so as to bring the society more into line with the charitable institutions of other professions; numerous donations have been received, Mr. Arthur Cates having contributed £100; Mr. G. T. Hine, £25; Mr. J. Macvicar Anderson, £10 10s.; Mr. G. Loughborough Pearson, R.A., £10 10s.; Mr. B. Ingelow, £5 5s.; Mr. H. C. Boyes, £5 5s., &c.

In the matter of the long-projected removal of the double block of houses forming the west side of Parliament-street and the east side of King-street, so as to form a wide thoroughfare from Charing-cross to Westminster Abbey and the Houses of Parliament, the new First Commissioner of Works, Mr. Akers Douglas, has adopted a policy even more liberal than that initiated by his predecessor. Last session Mr. Herbert Gladstone brought in a Bill which, though only a preliminary measure, secured the approval of the House of Commons for this long-contemplated scheme, and this is to be carried a stage further by Mr. Douglas. Moreover, the area of Crown land at Whitehall, on which Carrington House recently stood, was, under Mr. Herbert Gladstone's scheme, to be sold, the proceeds to go to the credit of the approach works. Sir Michael Hicks-Beach has consented to utilise this site for public offices, thus relieving the First Commissioner from the necessity of narrowing the sweep of the new approach by building on a portion of the cleared ground.

The Improvements Committee of the London County Council have reported favourably on a proposal by the City Commissioners of Sewers that the Council should co-operate in bearing the cost of the proposed widening of Fleet-street between Ludgate-circus and Salisbury-court, estimated at £194,500. The committee state that the proposal is to increase the width of the street from 45ft. to 60ft. The present application is in respect of a proposed widening of the road for a length of about 320ft. only; but there will still remain two other portions of the street, between Salisbury-court and Temple Bar, having together a length of about 1,100ft., which at some future time will require to be widened. The present improvement is, moreover, only the commencement of a much larger scheme, which would doubtless cost something approaching £1,000,000. The cost of dealing with the three properties between Ludgate-circus and Bride-lane, and widening the street to 60ft. between those points, is estimated at £31,560, and they recommend the Council to contribute £15,780, being half the cost of the improvement.

The British School at Athens is carrying out excavations in Athens, with a view of ascertaining the true site of the ancient Athenian suburb called Kynosarges, known for its gymnasium. This was long thought, on the authority of Leake and others, to lie at the foot of Mount Lykabettos, on the south-eastern side. Recently, however, Professor Dörpfeld has contended that the Kynosarges must have lain further to the south, along the banks of the Ilissus. In pursuance of this view, Mr. Cecil Smith, director of the British School, examined a spot on the south bank of the river, several hundred yards below the Stadion, where the ground falls away from a small plateau in an abrupt and perpendicular manner, indicating the presence of hidden walls. As soon as a trench was begun to be dug through this plateau numerous walls, chiefly of the Roman period, were revealed but a few inches below the surface, and the outline was soon manifested of a Roman calidarium. Numerous fragments of ancient Greek vases and various metal objects have been found in the rubbish excavated; the remains of a huge vase of Melian type in par-



ticular constitute a unique find in Attica. The wide extent of the ruins, and the solid character of the masonry discovered thus far, make it evident that this is the site of a large public building or group of buildings.

Four years since it was discovered that the walls of the Albert Institute at Dundee were fissured in several places owing to the decay of the wooden piles on which they rested. The building was reported upon by Mr. Alexander, the city architect, who stated that the foundations were in a very bad condition, and that the whole building needed underpinning. The city council adopted his report, and the difficult operation of underpinning all the walls has since been carried out by Mr. Robert Laing, builder, of Dundee, under Mr. Alexander's supervision. The porch to the museum was first taken down and reconstructed on new foundations, and that to the library having been similarly treated, the main walls were successively dealt with in short sections, the last of which is now approaching completion. The first step was the excavation of the earth immediately beneath the walls, laying bare the two rows of piles, to a depth varying from 7ft. to 12ft. There was great variation in the extent to which the piles were decayed, the rotting being in some instances very slight, while in others the outside of the wood was reduced to a soft pulp for a length of 7ft. or 8ft. from the top. All the piles, both the corresponding piles in the front and back rows, were cut down and reduced to the same height. Across these, horizontally, was laid a stout oaken beam, and above this, directly over each of the old piles, was set a pile of oak reaching to within a few inches of the base of the walls. In the space thus left there was inserted another horizontal beam, fitting closely; and the whole was consolidated by the driving in of malleable iron wedges. The walls being thus rendered temporarily secure, a bed of concrete of an average depth of 7ft. or 8ft., measuring 9ft. in breadth at the base and about 4ft. at the top, was laid around the piles close up to the old foundations, flat bedded stones being inserted at intervals, and the whole keyed-up with wedges, as in the case of the piles. The work will be completed in about two months.

Owing to continued ill-health and advancing years, Mr. W. S. Till, the city surveyor of Birmingham, finds it desirable to relinquish some of his duties. He has now served the local authorities of the city, the *Birmingham Daily Post* remarks, for over half a century, having been articulated in 1846 as a pupil to Mr. Pigott Smith, then the surveyor to the Commissioners of the Street Act, and in 1850 the commissioners appointed him to be Mr. Pigott Smith's assistant. In 1856, on the retirement of Mr. Smith, the office of borough surveyor was conferred temporarily by the town council on Mr. Till, and in the following year he was fully appointed to that office, and has held it without a break, and almost without a holiday, ever since. When Mr. Till became surveyor there were forty miles of sewers in the borough; there are now about two hundred miles, and all these were planned and executed by Mr. Till. The street mileage, involving road-making, laying footpaths, kerbing, and guttering, has increased from about a hundred miles to over two hundred miles, and the street-lighting has much more than doubled in the number of lamps erected in the same period. The preparation for the Improvement Bills of 1851 and 1862 devolved largely upon Mr. Till, and to him has been committed the planning and execution of the street and other improvements arising out of these measures, this department of the work involving long and difficult negotiations in the acquisition of property, and in the arrangements made with landowners and their agents and surveyors. The central Smithfield Market was designed by the surveyor, and its construction was conducted by him, as were also the works of the Interception Department in Montague-street, and the sewage outfall works from their commencement, and the great development of sewage treatment under the Drainage Board, to which Mr. Till has acted as engineer. The Public Works Committee will, at the next meeting of the city council, propose that Mr. Till should retain the office of city surveyor, with diminished duties, and with a reduced stipend, and that a competent assistant should be appointed to take up the main burden of the work. The present stipend received by Mr. Till from the council is £1,000 a year, with an addition of £400

a year from the drainage board, as its surveyor. It is now proposed that Mr. Till should give up the work of the Drainage Board, and that he shall receive £600 a year as city surveyor, instead of the £1,000 a year now allotted to him. It is further proposed that an assistant shall be appointed at a salary of £800 a year, the cost to the ratepayers of Birmingham of the city surveyor's staff thus remaining at the present amount.

THE Improvement Committee of the Liverpool Corporation have under consideration a plan which has been prepared by the city surveyor (Mr. Shelmerdine), designed to deal with the improvement of roadways and approaches towards Dale-street and Manchester-street, and the utilisation for this purpose of the land connected with St. George's Hall and the public buildings which belong to the group of which it is the centre. The committee are by no means unanimous as to the proposals; but have ordered the city surveyor to have a model prepared, and estimates obtained as to the probable cost before making a report on the subject.

THE architects in the district are taking great interest in the Manchester Buildings Trades Exhibition. There will be a very fine collection of drawings, the entries for which will close on the 11th of April; but entries for ordinary space will close on the 31st inst., when final allotments will be made. Building material of importance will be thoroughly represented, particularly in terracottas, tiles of the most varied description, bricks, slates of rare qualities, ironwork, polished marbles, granites, leaded lights, &c.; the latest improvements in grates, ranges, &c., ventilators, smoke preventatives, interior decorations, including Japanese wallpapers, mosaics, ceiling decorations, &c. Some of the latest improvements in hoists, woodworking and brickmaking machinery will be shown. The sanitary section will be exceptionally good. Messrs. Doulton are to the fore in this department, the first show they have made in Manchester since the Jubilee Exhibition.

THE chemistry of paint as a protection for iron from the process of rusting has received considerable attention of late; but the composition of a good paint for iron has yet to be discovered. One of the difficulties is that, as iron is not an inert substance, but is full of movement under changes of temperature, the protective covering should be able to meet these conditions. Most paints used do not adhere firmly, but peel off, and they do not resist frictional or external injuries. Again, a good paint ought to be one that will adhere firmly to a hot iron surface. The question is discussed in a recent number of the *Proceedings of the Engineers' Club of Philadelphia*. One useful liquid for coating iron is said to be African sandarac gum dissolved in alcohol, the colours being produced by aniline dyes.

THE British Vice-Consul in Venice in his last report says that last year the Venice and Murano Company executed a mosaic for a palace now in course of construction in Vienna. It measures 1,000sq.ft., and is copied from cartoons by the painter, Edward Weith, the subject being the five parts of the world. Europe stands in the centre of the frieze, represented by the symbolic figures of its various nations, having on one side the emblems of industry and trade, and at the top the emblem of the flying genius of light. On the right are the figures of Asia, India, China, and Japan, with their rajahs, mandarins, and the allegorical chrysanthemum. Next follows Africa, with camel-drivers, palm-trees, and other African symbols. On the left America and Australia, with natives on horseback and on foot, foliage, and other emblems. The types are twenty in number, from the fair Circassian down to the negro, and the display of costumes ranges from the most decorative to the simplest. The same company is executing another important mosaic for the apse of the Guards' Chapel at the Wellington Barracks, in London, from cartoons painted by an English firm.

A PLUMBERS' mass meeting was held on Wednesday evening at the town hall, High-street, Kensington, London, to discuss and protest against the Registration of Plumbers Bill, introduced by the Worshipful Company of Plumbers, and now down for the second reading in the House of Commons, which, it was contended by the promoters of the meeting, will, if made law, be detrimental to the plumbing trade generally. Vigorous protests were also raised against the

Worshipful Company of Plumbers' indirect interference with non-registered plumbers. Mr. Beecroft occupied the chair, and the attendance numbered between four and five hundred members of the craft. Mr. Philip D. Davies, of Earl's Court-road, read a paper, in which he called attention at considerable length to several clauses of the Plumbers' Registration Bill which he regarded as unsatisfactory, and needing amendment, special stress being laid on clause 3, giving the constitution of the General Council of Plumbers, with, as he contended, undue predominance to the Worshipful Company of Plumbers; on clause 4, which states that the members of the general council must themselves be registered; and on clause 8, which vests the duty of registration in the Plumbers' Company. A second lengthy paper was read by Mr. A. Cordell, of Hoxton, also condemnatory of the Bill as one-sided. Mr. F. Randall, of Wandsworth, moved, and Mr. Jarvis seconded, a resolution, declaring that the Registration Bill now before Parliament would, in the opinion of that meeting, tend to create a monopoly in the hands of master plumbers and sanitary engineers; that it would be an unwarranted interference with the rights of non-registered plumbers; while it would not afford additional safeguards to the public health. To this an amendment was moved by Mr. Thomasson, and seconded by Mr. Davenport, declaring that the meeting approved of the principle of the national registration of plumbers, and appointed six delegates to confer with the promoters of the Bill, and arrange any required amendments, especially in the way of the reduction of the proposed registration fee and annual subscription to half-a-crown each. The amendment, on being put to the meeting, was declared lost, and the original resolution was then carried by a large majority.

THE principle of statutory registration is being carried to an extreme point by members of the New York State. A Bill has been reported favourably to that Legislature from the Committee on Cities, providing that, in the cities of New York, Brooklyn, Buffalo, Rochester, and Syracuse, no person shall practise as a mason or builder unless he is duly registered in the office of the county clerk; and, in order to obtain such registration, he must be a citizen of New York State; must have served four years at his trade; must have passed an examination before a board of examiners, and must pay a fee of ten dollars. Violation of this statute is, by the Bill, to be punishable by a fine of not less than fifty, nor more than two hundred and fifty dollars, or by imprisonment for a term of not less than ninety days, or more than two years, or both, at the discretion of the Court.

WE have elsewhere referred to the enormous imports of Swedish deals. It is said that London receives more deals from Swedish ports than from other countries. It is also stated that "we receive more from Russia than from St. Lawrence, and more from Norway than from New Brunswick." The shipments to London of pine deals from the St. Lawrence is also very large.

In the case of the application for discharge from bankruptcy of Henri Frédéric Solaini, carrying on business as Solaini Brothers, of Liverpool and Egremont, architect, the order for discharge has been suspended for two years, ending Jan. 31, 1898.

The new General Infirmary in Springfield Park, Lancaster, opened by the Duke and Duchess of York on Tuesday, has been built from plans by Messrs. Paley, Austin, and Paley, of Lancaster, at a cost of about £30,000.

The London County Council have postponed, until after Easter, a decision upon the proposed Strand Improvement Scheme, and also upon the questions at issue between the Fire Brigade Committee and the Works Department.

The next Special Certificate Examinations for the members of the Surveyors' Institution in Forestry, Sanitary Science, and Land Surveying and Levelling, are proposed to be held under the auspices of the Institute on Tuesday, Wednesday, and Thursday, the 16th, 17th, and 18th of June. Particulars of these examinations can be obtained from Mr. J. C. Rogers, the secretary of the institution, 12, Great George-street, S.W.

The town council of Aberdeen have appointed Mr. William Young, of Lancaster-place, Strand, W.C., the assessor in the competition for alterations to the municipal buildings of that city. Premiums of £50 and £20—not by any means extravagant sums, be it observed—are offered for the best and second best designs.



**MEETINGS FOR THE ENSUING WEEK.**

**SATURDAY (TO-MORROW).**—Edinburgh Architectural Association. Visits to Inverkeithing and Rosyth Castle. Train from Edinburgh 2.10 p.m.

**WEDNESDAY.**—Royal Archaeological Institute. "The Benedictine Abbey Buildings of St. Peter, Gloucester," by W. H. St. John Hope. 4 p.m.

Glasgow Architectural Association. Presidential Address. 8 p.m.

**Trade News.****WAGES MOVEMENTS.**

**ABERDEEN.**—The threatened strike of the operative joiners was averted on Friday by a settlement of the dispute. Under the arrangements the men will get an advance of  $\frac{1}{4}$ d. per hour, and the retention in the by-laws of the existing rule that notice of any changes be given annually by either side. The masters agreed to withdraw a six months' clause.

**KETERING.**—The carpenters and joiners have demanded an increase of wages from 7d. to  $7\frac{1}{2}$ d. per hour, and a reduction in working time from 59 to 56 hours per week. The bricklayers have also asked for a like rise from 7d. to  $7\frac{1}{2}$ d., and the labourers for a penny increase from  $4\frac{1}{2}$ d. to  $5\frac{1}{2}$ d. per hour.

**PAISLEY.**—On Saturday the secretary to the Paisley Operative Joiners' Association received intimation that the masters had conceded an increase of  $\frac{1}{4}$ d. per hour, to come into force from March 30 without alteration of the former conditions.

At the London Sheriff's Court on Tuesday, Mr. Under-Sheriff Burchell and a jury heard the case of "Moore v. the London School Board," an action in which the plaintiff, Mr. Henry Moore, a builder, of 421, Mile-end-road, sought to recover the sum of £8,341 from the London School Board as compensation for compulsorily acquiring 22 freehold houses in Globe-road, Mile-end. Witnesses as to the value of the property having been examined, the jury assessed the damages at £7,150, for which sum judgment was entered, with costs.

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**TENDERS.**

\* \* \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**BAGSHOT.**—For additions to the "Orchard," Windlesham, near Bagshot, for Mrs. Earnshaw. Mr. R. Clamp, A.R.I.B.A., Woking, architect:—  
Norris and Sons, Sunningdale ... £288 0 0  
(Accepted.)

**BLACKPOOL.**—For painting the Blackpool Tower. Messrs. Maxwell and Luke, Manchester, architects:—  
O'Callaghan, T. F., Manchester ... £1,400 0 0  
Bagnall, A., Shipley ... 820 0 0  
Burnell, R. T., Rochdale ... 750 0 0  
Ball, J., Oldham (accepted) ... 750 0 0

**BUILTH.**—For the erection of cottage hospital and convalescent home, Builth, Wales, for the trustees. Mr. Telfer Smith, M.S.A., Builth, architect:—

Jones, J. M. ... £2,008 0 0  
Downs, C. J. ... 1,897 19 8  
Rice, H. ... 1,800 0 0  
Jones, T. (accepted) ... 1,850 0 0  
Meredith, A., Newbridge-on-Wye\* 1,500 0 0

Rest of Builth. \* Withdrawn.  
(Architect's estimate, £1,658.)

**CHESTER-LE-STREET, CO. DURHAM.**—For providing a supply of water from the mains of the Newcastle and Gateshead Water Company, to the villages of Springwell and High Usworth, for the Chester-le-Street Rural Council. Mr. D. Balfour, M.Inst.C.E., Newcastle, engineer:—  
Goldsbrough, J., Chester-le-Street (accepted).

**CHelsea.**—For the erection of a new school for 1,422 children (with school for special instruction and school-keeper's house), in Kingwood-road, Chelsea, for the London School Board:—

Lovatt, H. ... £29,164 0 0  
Patrick, J. and M. ... 29,047 0 0  
Lathey Bros. ... 28,800 0 0  
Collinson, J. F. ... 28,706 0 0  
Pattinson, W., and Sons ... 28,325 0 0  
Grover, J., and Son ... 28,282 0 0  
Yerbury, R. A., and Sons ... 27,999 0 0  
Wallis, G. E., and Son ... 27,974 0 0  
Charteris, D. ... 27,698 0 0  
Holloway, Bros. ... 27,407 0 0  
Downs, W. ... 27,280 0 0  
Treasure and Son ... 26,986 0 0  
Dove Bros. ... 26,725 0 0  
Stimpson and Co. ... 26,500 0 0  
Kirk and Randall ... 26,435 0 0  
Shillitoe, J., and Son ... 25,950 0 0  
Cox, C. ... 25,923 0 0  
Lawrance, E., and Sons\* 25,696 0 0

\* Recommended for acceptance.

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# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2152.

FRIDAY, APRIL 3, 1896.

### ARCHITECTS AND CRAFTSMEN.

WE are told by Mr. Ruskin, and with much truth, that we are always trying to separate labour and thought;—"one man is always thinking, another is always working." In almost all vocations and trades this separation of labour and thought is taking place, and has brought about many of the anomalies from which we are suffering. We get either a lot of idealists and dreamers, or a number of "soulless machines." In large public departments of the State, in public works, the same division of human action is seen. Like Sisypheus of old, men and horses are daily employed in repairing our streets and roads by dragging huge loads up steep gradients, in transporting materials to great distances, when a slight exercise of thought might have relieved them of the trouble, and shown them where the necessary material can be obtained close at hand. A vast amount of useless labour is expended, which practical skill would have avoided. Has it not been so in building? Thousands of pounds have been spent in the erection of buildings in localities that a knowledge of the district might have saved. Bricks are transported many miles, where the natural stone of the locality would have been better; enormous excavations and costly filling-in to foundations saved, if only a little practical thought had been brought to bear. The old Mediæval builders, who had fewer means of transit, reared their wonderful edifices out of the very site on which they stood; they quarried the rock near them, and employed local labour and craftsmen. Their buildings attest the combination of both thought and labour in the workman as well as in the master craftsman. How different now! In every department of modern work, the dissociation of these two factors is almost complete. We see the workman on one side, the master-mind on the other, each helpless to assist the other. Our modern furniture exhibits the same distinction: how little the designer and workman are the same individual—how far they are apart. The manufacturer is distinctly in evidence, the leg of every table and chair is turned or shaped to a pattern, the table-top is moulded to a certain profile, the chair backs are made up of a number of pieces, all repeats, and we cannot avoid the conclusion that each has been made by the hundred to a pattern for the sake of easy manufacture. The designer has never seen one of them: he may be a mere fiction. A pattern has been followed *ad nauseam*; all trace of the real thought is a vanishing quantity in the production. One thing is forced upon us—namely, that the workman has been a mere machine, he has simply cut or turned, framed or glued up the pieces, without exhibiting the slightest thought in the design or arrangement. The Technical Education Board are trying, by their competitions and scholarships, to reawaken the interest of the craftsman in this and other industries, by trying once more to unite the long-separated functions of design and workmanship, and the examples that were exhibited last week show that when the workman is allowed to exercise his artistic faculties, his work is infinitely better and more interesting.

When we come to building, the separation of thought and labour is equally apparent. The architect and the builder occupy very distinct, and in many ways hostile, positions. First, take the architect's position. He has been trained more or less as a draughtsman,

has made drawing and perspective the special studies of his youth, and is so far from denying to them the almost mystical power of arranging everything as it ought to be arranged, above every suggestion of practical skill on the part of the working craftsman, that he cannot tolerate any interference with his designs, however unreasonable or impracticable they may sometimes be. The very habits acquired by the set-square and compasses, the frame of mind which tolerates ease and comfort, undistracted from all considerations of such queries as, "How is this requirement to be met, or how is that strain to be counteracted?" "What should be the proper treatment of this or that material?" is brought to bear in arranging a plan or drawing. A section or elevation appears to banish all utilitarian considerations from the mind. The self-complacent wielder of the pencil seems, in the exclusiveness of his own sanctum, to utter one word—"Begone!"—to any doubts and insinuations which occasionally disturb his vision. He is master of the situation entirely as far as his part of the work goes. But, after all, this is not everything. To his own mind, the design on paper is perfect. All the thought is supposed to have been bestowed upon it, and no one else has a word to say. It is drawn to scale by his assistant, who may sometimes find a point to suggest or alter—often a great deal more than he gets the credit for—and then it goes straight to the quantity surveyor, who, perhaps, makes some further alterations. The contractor at last gets it as a complete and unalterable design. The specification and the quantities are also written and taken off in the office, quite irrespective of the various trades they represent. The worker has no part nor lot in them; he is seldom even consulted. At this juncture a line is drawn between the architect and the builder; on one side is all the thought and skill, on the other all the work. The separation appears complete. But we may go further. The builder or contractor is not the workman—only the agent. All the plans and details are put into his hands to turn out the job. His interest is only commercial; he is the business man: he buys, sells, arranges the materials, and looks after the workmen. His occupation is still in the nature of a thinker-out of the ways and means—how to make materials go the farthest, how to cheapen labour, possibly how he can make the architect's design remunerative. The thought of the architect goes directly not to the workman, but to the tradesman, whose business it is to see how much of it can be embodied or used in the building for a certain sum. It is needless to say that Messrs. Scrimp and Co., the contractors, are clever manipulators of brains on one side and workmen and machines on the other, and that by their intervention they can make both ends meet and "pull through" a job on commercial lines with the least possible friction between the architect and the workman. Let us look for a moment at the position of the worker. He has no interest with either contract or building. There is no effort made to hold the crafts together beyond the contracts. His surroundings are not favourable to that spirit of self-reliance and responsibility upon which alone good workmanship exists. He works and toils without any voice in the matter; the details are placed before him to work to, and he can only prefer any question or complaint to the foreman or builder. Access to the architect is, of course, impossible, for so exclusive a personage has no connection with the work. It is useless to give him a technical education when he is bound to the *régime* of a system which will not permit him to exercise his own brains or to go behind the foreman. Reduced to the rank of a machine, he has simply to use his tools so as to produce the work expeditiously and economically.

Let us draw a contrast by taking the studio and the workshop. One represents thought in, let us say, the office of the architect. It is situated in a street retired from main thoroughfares—it may be in the very genteel neighbourhood of Bedford-row or Bloomsbury. The very atmosphere is congenial to quiet musings with the pencil or brush. In it is a desk; on the walls are hung a few drawings, executed, or unrealised views of buildings; there is a model of the Parthenon, a case of books, volumes of professional journals, instruments, casts of ornament, and apparatus, a few building specimens, and innumerable trade catalogues, &c. This is how the artist's studio is described by Mr. Ashbee in his interesting book on "Handicrafts": "It is fitted with all the apparatus necessary for lighting, lifting, and wheeling to and from exhibitions of the large masterpiece, and it is ornamented with all the conventional gusto of the prevalent Queen-in-Anne-ity. There are scraps of damask silk bartered from Roman curiosity shops, divers subjects under way, various Madonnas of the future, suggestive of decorative work; there is a cast of Phidias, a photogravure of Millet, a skeleton and a lay figure. In the corner a pair of embroidered slippers, and on the mantelpiece pipes and tobacco." In such a sanctum the artist dreams and paints. What connection have these odds and ends, curios, and specimens of brocade and hangings, old furniture or armour with the actual work of the building or the decorative design? What have all these scraps to do with materials and construction, and how can their contemplation assist in designing details of stone, brick, or wood construction, or reanimate old ideas with new life? Impossible! It would be equally reasonable to attempt to design a piece of construction or an ornament in wood or iron from a plaster cast. How are building construction and design to be learned without a knowledge of the limitations of materials and the functions of the tool? It has been said, indeed, that Rivington's Treatise on Building Construction, which has to be mastered by young architects before they can pass the R.I.B.A. examinations, might be superseded if, instead of the isolation of the architect's studio, the students spent half an hour in the workshop. The real workshop—not the improvised one which architectural schools have provided—is almost too uninviting. Its situation is by no means inspiring; its walls are bare and whitewashed; it is surrounded by back slums, or is behind some mews; it is dirty and untidy, the benches and tools are of the roughest and readiest description. Here and there one sees the utensils of the workmen's dinner. There is not the faintest resemblance to the artist's studio: all is noise, hammering, sawing, planing, unmitigated evidences of hard utilitarianism.

We naturally ask ourselves how it is possible to produce the highest results under such conditions of isolation? We have no longer the tradition of the old crafts. Even where, as in the case of a large national building like the Houses of Parliament or the Law Courts, there might have been an opportunity of bringing artist and workman together, and establishing a school of co-operative craftsmen and artists, each class interpenetrated with the culture and skill of the other, these opportunities have been thrown away. Barry and Pugin, it has been suggested, might have done something in their time to bring back the old tradition of things; but professionalism and trade-unionism were too strong even then to encourage any mutual arrangement. Since then this isolated policy has gone on increasing. The architect shuts himself up within the four walls of his office, the workman in the particular groove of his workshop routine. Hence on one side, as Ruskin says, we make both classes ungente—"one



envying, the other despising his brother. It is only by labour that thought can be made healthy, and only by thought that labour can be made happy." Now the busy architect has more than he can do properly, and the craftsman is becoming more machine-like and a mere copyist of ideas. Thus we get ill-directed thought and mis-spent labour.

#### RAW BUILDINGS AND RIPE ONES.

"**T**IME has something to do with the difference; but the work is not only or mainly Time's. There are plenty of raw buildings that will never ripen, and plenty of ripe ones that were never harshly raw." So thought, at least, one architect of the present day on lately looking through some thousand photographs of architectural works, old and new. Had they all been new, they might have kept one another in countenance. As it happened, the new ones were in a minority. Their design was not always bad. Very often it was clever, and even artistic, while many of the old ones had hardly any design about them. Yet at the worst, they were quietly agreeable, pleasant even, in a homely, unassuming way. One accepted them as one accepts the unobtrusive in Nature; as one takes a cloudy sky or a rainy day. These things, though we seldom pay much attention to them, play an indispensable part in our lives. They are the background from which brighter forms and colours stand out, and without which the brighter ones would soon overpower us, or else weary us. The plainest of ancient buildings have this kind of softness and mellowness about them. It is rare, indeed, to find it in modern ones; but this fact does not always come out in the published illustrations. The artistic draughtsman, consciously or not, supplies it where it is wanting, and gives his new building—on paper—something of the softness and ripeness of the older ones. The photographer, on the contrary, may do much for his sitters, but seldom flatters his buildings. Above all things, he exhibits their rawness or their ripeness; and the architect who thinks more highly of himself than he ought to think, needs only to get his pet production photographed, and to hang up the print of it beside one of any ancient or Mediaeval structure.

Mr. Greville Montgomery's interesting paper on bricks, which we reported last week, suggests some such train of thought as this. In the main, it showed us the producers of our most universal building material deliberately setting themselves to make that material more raw, more harsh, more deadly dull than it is by nature; and the public encouraging their efforts in the most practical way. With all the current talk about culture and art training, we can expect no better of the public. Till they are again surrounded in their daily life, as they were in artistic ages, with beautiful and wholesome things, they are not likely to appreciate these things, or to choose them when they see them. They only know, as a child or even an animal may know, that one surface is smooth and uniform, while another is variable and uneven; and they have been taught all their lives that the mechanically regular one is to be preferred. Lines of mathematical straightness, faces of mathematical smoothness, are their ideal, and the nearer anybody, from a brick-maker to a cabinet-maker, can get to this ideal; the more highly they think of him. It is they who are the first to interpose, if any architect of to-day tries to get the ancient softness and mellowness on his walls, the ancient texture of light and shade on his roofs. It is they, and the architects who have to please them, who bring smooth bricks, and pressed bricks, and glazed bricks more and more into fashion, and who, if they carried out their favourite notions to the full,

would cover their buildings with an even coat of polish, from plinth to ridge.

The one reasonable excuse for trying glazed surfaces on external walls has been to make them smoke-proof. In the main, however, the attempt has not succeeded. White glazed bricks or tiles answer, to a certain extent, in narrow city areas and passages, where light is scarce, and everything else must be sacrificed to getting it. They are too raw, apparently, even to please the public, where architecture is attempted. Here we often see façades with darker glazes, sometimes, though seldom, showing an eye for colour; but hard and raw even then. In Bishopsgate Churchyard, for instance, there are a few square feet of bluish-green glazed brick and red terracotta, which harmonise with each other, and, on a sunny summer day, half-tempt the beholder to similar experiments. Such combinations may be successful in Persia; but our skies are seldom bright enough to suit them here. And, further, the treatment that may be agreeable in small spaces like this, would look grossly overdone in a large architectural design. If, for mechanical reasons, some approach to a smooth brick surface is anywhere necessary, a semi-vitrified one is generally better than a glaze. The Great Eastern Railway Company has lately built along its line large quantities of retaining walls with seconds blue Staffordshire bricks, and the effect, though sombre, is not unpleasant, for a railway. But the brick coming into favour just now in London seems to be a red pressed brick or a machine-made brick from one part or another of the Midlands. It is uniform, terribly uniform, in colour. It is smooth, terribly smooth, as to surface. It is hard, terribly hard, as to substance. The bricklayer cannot shape it or work it, or even mitre it. He may snap it across, no doubt; but with this exception he must lay it as it comes.

There used to be a child's song about a pebble and an acorn, in which the pebble boasted, "Nor time nor seasons can alter me, I am abiding while ages flee." This seems to be the boast of the Midland brick. It never mellows, or softens, or tones down. It is heavy, sharp, and solid—you fancy it will last for ever. But see it in its native haunts, at Birmingham or Manchester, in buildings 40 years old or more. Where it has lasted, it is just as hard-edged and aggressive as ever; perhaps more so, for the edges catch the smoke, and assert themselves more and more unpleasantly. But where it does not last, where it was underburnt, or where wind and weather have caught it most, it fails as the soft, sanded red bricks of Kent, and Suffolk, and Hampshire very seldom fail. When they "go," it is commonly grain by grain, and the inside, which is then exposed, differs little in colour from the original face. But with the smooth Midland brick it is not so. The frost catches it and shatters it to pieces. Its surface falls off in great flakes, and exposes a dirty white or pale red interior, often in layers, like the leaves of a book. The process once begun, goes on, and where there was a defective brick, there is, or after no long time will be, simply a hole. Sometimes there are many such holes in a façade—at other times few or none; but, looked at from a structural point of view, the danger of its perishing in this particular way is one of the things most to be guarded against in using a Midland pressed brick. A wire-cut white brick, again, which rapidly became a dirty blackish brick, was much used in London a quarter of a century ago; and with a desire to give the public credit for all the improvement in taste which can be fairly assigned to them, we must admit that even the smooth red brick they now fancy is a great improvement on this. It was generally pierced through with numerous holes, which were supposed to form a key for the mortar. But mortar was very reluctant to adhere to it, holes or

no holes, and when a wall built of these bricks is now pulled or pushed down it commonly happens that most of them come out as free from all trace of it as if they had just been taken from the kiln.

We have not written all this to advocate by contrast the claims of the London stock, which Mr. Montgomery very properly condemned. It is unpleasant-looking as to surface, and except in the "malm" varieties, time never mellows it. When new, it is far from beautiful in colour, and when it gets dirty it is execrable. Nor are the present-day Suffolk or Kentish bricks by any means perfect. They are scarcely durable enough for places where they get much exposure, and especially much "splash." But they do mellow by time, which is more than can be said of their rivals from Staffordshire and Leicestershire, and Northamptonshire. What we want is to get this mellowing effect without any serious decay—to have it as a surface toning, which does not eat into the body of the brick. And we want to get "texture," play of light and shade, variety and gradation of tone, all over our brickwork. Our ancestors managed to get it. Look at any old house in Norfolk or Suffolk, and at more than a few in Essex. Their bricks lasted, and so did the mortar they were set in. The wear and tear of centuries have brought them artistically to their best, so that, as to colour and softness of effect, we cannot hope quite to match them in our lifetimes. They were helped as to texture, by being thinner than ours, and by being laid with thicker beds; so that, instead of a uniform red, there was a flickering of light and shade, of orange and purple and grey, all over the walls they composed. Thinner bricks and thicker mortar joints than our present ones are what we now want—alike for appearance and strength—provided always that both bricks and mortar are sound. But what our Midland friends give us—or would give us, if we were not constantly refusing to take them—are such bricks as they love themselves: at least  $\frac{1}{2}$  in. thicker, instead of  $\frac{1}{4}$  in. thinner, than the old-fashioned London stock. The makers are at the height of their glory when they can go a little further even than this, and produce a mass of mouldings all in one gigantic piece, with lines scratched across them to represent putty-joints.

Here we are approaching the subject of terracotta—a material which too often is the very embodiment of rawness and harshness. When it first came into fashion here, more than twenty years ago, one used, half-unconsciously, to make allowance for its newness, and to wait, before judging of it, till it had toned down a little. But toning down is the one thing that never happens to it. Some of it cracks, some of it perishes, some of it gets covered with alternate streaks of soot and no soot, like a sweep's face in a shower; but none of it gains softness or mellowness of colour by age. In the course of years it loses the attractions of youth, without gaining others. Nothing clings to it, nothing grows on it, not even the almost-microscopic lichen which covers large surfaces at St. Paul's. The early attempts have one quality which does something to redeem it—namely, variability of colour. It passes from light buff into dark, rich buff, and back again. It is flushed here with vandyke brown, and there with burnt sienna; occasionally there is a corner or a moulding tinged with red. But its manufacturer knows better now. He gets it all alike, and prides himself on the "improvement"; the improvement of covering a large building with an unchanging, exasperating monotony. We have seen too much of this "improved" terracotta. It is time we had some that will soften and tone down, without perishing. There are clays in Essex which will produce that rare thing, a rich buff or orange-brown kiln-burnt brick, fit to cut or rub, quite different from the light-red cutters of the Aylesbury district,



excellent as they are in their way. We have tried what can be done with smooth-faced terracotta; there is an opening now for a sanded-faced or malm-like one.

There is no space, in a single article, to do more than touch the margin of this subject. Rawness or ripeness runs through everything with which architecture deals; through masonry, carpentry, slating and tiling, plastering, glazing, metal-work, and coloured decoration, as well as brickwork. In all these things old work is soft, mellow, and harmonious, while modern work is hard, raw, and irritating. For some obscure reason nothing brings out the contrast so forcibly as a photograph, and if we cannot see where we fail in these particulars, that candid friend, the camera, will quickly tell us.

#### ROYAL SOCIETY OF BRITISH ARTISTS.

THOSE whose expectations have been raised by the improved quality of the work which has lately been seen in the galleries of Suffolk-street will be rather disappointed in the present exhibition. Few pictures of exceptional merit are hung. We see a great many experimental and crude-looking canvases of more or less promise, and a large sprinkling of works of mediocre kind. In the central gallery Wm. Manners has a landscape in which he shows how strength of handling and depth of tone can be combined in his autumnal-toned picture of "Harvest Field, Wharfedale" (2). His other landscape and forest studies display a true feeling for the calmer aspects of nature. The large composition by A. Gemmel Hutchison, "Young Communicants," is wanting in clearness of intention. The group of young men and girls round a table reading might do for any village club meeting. The drawing and the handling are good, but there is a lack of meaning and character in the meeting of the youth of both sexes who are met together for religious preparation or instruction. The studies of lions' heads, "Broken Cover" (1), and "Roaring" (11), by Fred. Thos. Daws, are vigorous examples of leonine habits. Yeend King's "March Mists" (12) is full of soft, misty light, and at the corner of the gallery hangs a large upright picture by C. Brockman, "Moonrise: La Somme" (20), an impression in tones of blue and red. J. H. Inskip's broad study of cliff, "A Weedy Corner on the Cliffs, Robin Hood's Bay" (32), with the blue sea in the distance, is broad and sympathetically painted, and his other subjects show him also to be a broad and feeling painter of nature. E. Reginald Frampton is a promising painter. His "Evening in a Cornish Fishing Village" and his "Fishing Boats" have qualities of breadth and colour which resemble those of the Glasgow school. Edmund E. Fuller gives us a strong luminous impression of sunlight and reflection on a rippled sea (40), the clear, shining after rain being cleverly shown in the boats and sky. "Off Margate" (45), by G. S. Walters, is fresh and strong, and his view of "The Mumbles Head, Swansea Bay," and other studies of sea and boat craft, are evidences of the skill he has evinced in this special branch. Lovers of the sea will welcome Frank Kelsey's "Sea Birds," a bright sea with flitting wings of breezy canvas sails; clever also are his gull studies (89, 144). Other sea and coast pieces of note are Francis Black's "Their Last Moorings" (65); Alice Fannel's Cornish coast view, with its bleak rocks and blue sea (154). Many springtide qualities are to be found in Adam E. Proctor's "Spring Time," with its young foliage and blossoming trees. "Childhood," children fishing, by John R. Reid, is, as usual, strong in colour and full of light. Impressionism of the better sort is to be seen in W. H. Y. Titcomb's "Marguerites" (79), a field under strong sunlight, a child picking the flowers. Arthur Mead's bleak-looking landscape, with bare

trees, "In the Hollow of the Hill," has the merit of strength and suggestion of loneliness; and we may notice Henry Zimmerman's "Meadow Pool" and "Return of the Flock" as other examples of realism of a stronger kind. The President, Wyke Bayliss, has not forgotten the charm of his subtle pencil, and the lines of Tennyson—

O Milan! O the chanting quires!  
The giant windows' blazoned fires!  
The height, the space, the gloom, the glory!

are fully embodied in the fine perspective and colour of this interior (94). Fresh foliage and foreground are well rendered in John Aborn's "Sunny Surrey" (99). Pleasing and natural is the impression of light in the girls gleaning in 103, by H. P. Hain-Friswell. Arnold Helké has chosen too large a scale for his corner picture, "Digging Bait" (108). The sea beach, the clouds, and fresh morning light on the ripple of distant sea are all faultless, but lacking in force. A pretty bit of foliage and blossom is seen in H. A. Olivier's "Hampshire Yew Trees" (113). Adam E. Proctor has a humorous picture of an old drowsy monk with a glass of wine in his hand. J. Noble Barlow's "Midnight" (118) is true in its moonlight tone, and the large centre landscape by George Harcourt, "Dunglass, Cockburnspath" (131), is strongly painted, the red sunset sky seen through branches of the trees. Delicate handling in the beech trunk and the mossy roots, the softness of the water and reflected light, are qualities in Thos. Ireland's "Haunt of the Wild Duck." The companion studies by G. Sherwood Hunter, of "The Sea of Galilee" (22), and "On the Shore of the Dead Sea," are impressions too crude and deep in blue to be thought realistic or natural.

James Peel's view of the "Lledr Valley" (174) is finely rendered in its atmosphere. Strong in colour is Frank Spenlove-Spenlove's "Outgoing Tide" (176); and a little further Graham Petrie gives us a charming sketch of "Fruit Market, Venice" (188), in which the breadth, light and shade, and colour are pleasing features. Charles H. Eastlake's "Portrait" is well posed and painted in an impressionistic manner. Davidson Knowles paints vigorously crested billows tumbling in shore in his "Missing Boat"; and we have other works, by J. Herbert Snell, J. Peel (206), R. Machell (195), of interest. Natural in its surroundings and colour is Chas. Collins's amusing discussion about the price of a horse at a cattle fair on a common (194). W. T. Warrener's impressions (214-215) are vivid. "Summer," representing girls, quite naked, drying themselves after a swim in the river, is conspicuous for the almost crude contrast of the blue shadows of the girls on the grass and the strong sunlight. The ladies inspecting a show of chrysanthemums in a conservatory is admirable in its light contrasted with the dark dress of the visitors. W. Hunt's "Autumn" (226) is certainly able, and has the true note of poetic conception. The sad season is embodied in the obscure, graceful figure of a nude woman, who is standing near the edge of a reedy river. She seems to be wandering on the misty brink, sad and dejected amid the autumnal tints and sedge. The very imperfection of the figure happily symbolises the dying year. W. S. Jay's large forest glade, "The Dead Ring-Dove," and a large picture by Stuart Lloyd (233), and W. Graham Robertson's "Kate the Queen" (234), a legendary composition of some merit; a decorative panel subject, "Twixt Memory and Hope," by E. A. Fellowes-Prynn (239), are of interest. In Wm. Strutt's large picture of a lions' den (243) there is much that is clever in the composition and of boldness in the light which radiates down the flight of steps in which the angel stands who has overawed the crouching and half-sleeping lions at the foot of the flight of steps. Another composition in the

opposite corner is V. P. Yglesias's "A Mystery." The painter has very ably, as far as colour and indistinctness of forms—some weird, others entrancing—suggested, embodied the idea.

In the water-colour galleries there are a few good studies and sketches. Montague Smyth, in his "Flowering Dunes of Holland"; J. W. Parson's clever drawing, "Partridge Shooting" (264); Stuart Lloyd's tranquil scene, "The Golden Hour"; Reginald Smith's "Summer Mists"; the delicate handling in Albert Kinsley's "Golden Glow of the Dying Year"; Geo. C. Haité's "Market Day, Horsham," a free and clever sketch, are noteworthy. One of the best sketches is Ernest George's "Cremona" (297), showing the charming brick campanile. "The Harvest Moon," by Geo. C. Haité, is also a delightful and sympathetic rendering of cottages and moonlight. W. H. J. Boot's view of "Limburg-on-Lahn" (306) shows the noted Rhenish church, with its angle towers, and the President's delicate and beautiful drawing of "Sunrise in the Duomo, Orvieto" (368) must be mentioned in addition to other works of interest. There are some other pictures deserving of a passing notice in this year's exhibition; but the demands upon our space this week unfortunately compel us to restrict our transcript of the notes we have made to the briefest dimensions.

#### BANKS' FIREPROOF CONSTRUCTION.

BY permission of the House Governor of the new Nurses' Home, built in the rear of the London Hospital, Whitechapel, from the designs of Mr. Rowland Plumbe, F.R.I.B.A., a number of architects, engineers, and representatives of the Press visited the new buildings to view the fireproof construction which the directors of Banks' Fireproof Construction Syndicate, Ltd., of Queen Victoria-street, have applied to the floors and partitions. The visitors were enabled to examine for themselves every stage of the system. The ceilings of the ground-floor rooms are constructed with iron joists and concrete, the joists being spaced about 3ft. or 4ft. apart. Over these, steel hanging straps are placed, which carry ceiling bars attached by bolts. The centring for the concrete, composed of boards, is carried by these straps and bars, and when the concrete is set, by removing a bolt the bar falls and frees the wood centre, which can be used for another bay. Fixed to the ceiling-bars is the patent "helical lathing" of flat steel woven ribbon, twisted, which gives a "key" to the plaster and forms a "suspended ceiling," known as "Banks' ventilated fireproof floor B." A space of about 3in. between the wire lathing and underside of joist not only protects the floor from fire, but also affords a useful ventilated cavity between ceiling and floor proper. The same "suspended ceiling" of twisted steel wire is particularly valuable under wood joists and beams, the latter being incased with the lathing by means of metal hooks with oval eyes screwed into the beam, through which eyes small rods are passed. These rods keep the lathing in its place. The next party inspected the partitions, which were in various stages of completion. These were composed of Banks' cross-section standards, and "helical lathing," but corrugated, and the ends of lathing fixed to the standards by strong wire, while the "lathing" is also stiffened by passing flat steel wire through the meshes. A very firm lathing is thus secured, which makes a capital "key" for the plaster of two or three coats one ach side. We understand the plaster is composed of a special cement mixed with sand, which sets rather slower than Portland cement. These partitions, when finished, are only 2½in. in thickness, thereby saving ground-floor space, which is a point of some value in many buildings. In the new buildings they are used along the corridors, and for the partitions separating the nurses' rooms, of which there are 84 in the home. The roof is also eased by the same means, the helical lathing being fixed to the wooden principals and rafters by eyed hooks driven into the timber through which wire is threaded to hold the lathing. A space of 2in. is thus preserved under the rafters, also round the upright timbers and framing which divide the nurses' lockers.



We believe that this mode of constructing partitions protecting floors and of casing roof-timbers is one that must commend itself to the architect as being both soundproof and fire-resisting. We understand the price of these partitions finished is about 7s. 6d. per square yard, and the roofs about 4s. 6d. The system has been largely adopted in several important buildings, hospitals, stores, mansions, including the Brook Hospital, Shooter's Hill; South-Eastern Hospital, Harrod's Stores, and several large hotels and mansions.

Mr. W. Shepherd, of Bermondsey, is the contractor for the new Home. After a handsome luncheon served at the Three Nuns' Hotel, Aldgate, some of the visitors inspected the new rooms of that establishment, where the Banks' system has also been applied.

#### THE TIMBERS OF AUSTRALASIA. IV.

HARDWOODS. I. NEW SOUTH WALES (concluded).

THERE are two kinds of red mahogany—the Forest Mahogany (*E. resinifera*) and the Swamp Mahogany (*E. robusta*), neither of which must be confounded with either the White Mahogany (*E. acmenoides*) or the true West Indian mahoganies of commerce, belonging to a totally different Natural Order (the *Cedrelaceæ*, or Mahogany Order, No. 52). Few even of the New South Wales hardwoods combine so many excellent qualities as the Forest Mahogany. It appeals to the architect, the engineer, the surveyor, the shipbuilder, the cabinet-maker, and the woodcarver. It is found growing extensively near the coast line to the north of Sydney, reaching an average height of 120ft., with a trunk diameter of 33in. It is of the same family as the iron-barks, and of a deep red colour; but, though close in grain, it is unlike them in working with great ease. The timber shrinks to some extent in its green state; but the shrinking is evenly distributed, and the wood rarely splits or warps if cut from mature trees. Moreover, it seasons quickly in sawn sizes—of course, a commendable quality, and one of much importance to the builder—while with age it becomes as hard as, or even harder than, ironbark itself. For general building work Forest Mahogany may fairly take first rank in comparison with other hardwoods. For rafters it appears to answer completely; since those of St. John's Church, Parramatta, which were put up in 1798, were found to be quite sound and perfect when taken down in 1852. It seems almost a sin to employ so beautiful a wood for some of the coarsest purposes; yet as an engineering, shipbuilding, and paving timber Forest Mahogany bears an unblemished reputation. Not only do its great strength and durability render it of special value, but the fact of its being one of the few timbers that resist the *colera*, or sea-worm, lends it additional importance in furnishing piles, ships' knees, &c., while for paving-blocks it ranks next to tallow-wood and blackbutt. It is often sold for the jarrah of Western Australia, which it very closely resembles, and for which it is a perfect substitute. Moreover, it may be advantageously employed ornamentally, and in such items of woodwork as carved columns, &c., it gives every satisfaction. Swamp mahogany, though of much the same colour as forest, is very inferior to it for general purposes. It stands well, however, in the ground, and being of great strength and difficult to split (though rather brittle), makes excellent sleepers, while for ships' framing it is greatly appreciated.

White Mahogany (*E. acmenoides*) is a pale-hued timber, which bears no resemblance (as I have said) to any other mahogany; but has got its name (which is in general use throughout the colony, and, therefore, unlikely to be disturbed) on account of its light colour, and because the bark of the tree has been thought to resemble that of forest mahogany, though really it is more like that of stringy bark—wrinkled, furrowed, and persistent. It is a tough, strong, useful, and extremely heavy timber, said by users to be more durable after half a century of service than even ironbark or box, though not without some tendency to shell off. It resembles tallow-wood a great deal, but is paler, harder, and not greasy. It answers admirably for piles and girders, and is likely to prove valuable for paving-blocks and bridge-decking. It is less known, even in the colony, than it deserves to be—probably because it has been largely confused with other timbers, and the inferior kinds of stringy bark have

frequently been substituted for it. But it has long been used with the best results for general building purposes, and when cleanly planed displays a beautiful satin-like surface, with the grain often prettily veined or otherwise marked.

Mountain Ash is another timber about which (like the blue gums) a good deal of confusion still exists, it being diagnosed by Mr. Perrin and Mr. Maiden as *E. amygdalina*, by Mr. Maiden (later) and Mr. De Coque as *E. Sieberiana*, and by Mr. Coghlan and Professor Warren as *E. virgata* (!). The explanation appears to be that the name *E. amygdalina* was the botanical appellation given originally—I believe by Baron von Müller—to a group of eucalypts now ascertained to include several distinct species; for Mr. Maiden asserted, upwards of six years ago, that "differences of soil and climate cannot account for all the differences amongst the timbers now classed as *E. amygdalina*." At all events, the latter species is the giant "mountain ash" of Victoria, which attains a frequent height of over 300ft., and an occasional altitude (according to some observers) of 400ft., and in its smaller form is one of the "peppermints" of New South Wales—the one from the leaves of which much of the essential oil of eucalyptus is distilled, and not to be confounded with another one, the *E. piperita*, sometimes known as "white stringy bark," but of no great value. The genuine mountain ash of New South Wales, however, the *E. Sieberiana*, is an exceedingly valuable hardwood, especially to coachbuilders and wheelwrights, who, in its native colony, recognise it as more durable than American ash (which it closely resembles), and quite equal to it in every other respect for their particular purposes. The tree loves high rocky or stony mountain ranges, or poor and barren ground, and never takes kindly to grassy localities. The wood is easy to work, and its quality appears to be less variable than that of most of the eucalypts. Its durability is especially marked in damp situations, its resistance to decay in water-mills and damp mines being very noticeable. At one of the meetings of the Engineering Association of New South Wales, part of the spoke of a mill-wheel without the slightest symptom of decay was exhibited, which had been in use for twenty years, and was afterwards exposed to the weather for a twelvemonth. The White Ash (*E. stricta*) need only be mentioned incidentally, as it could not be profitably exported until cheaper means of transit for it are obtained. But it is a splendid wood, equal in every way, if not superior, to American ash. At present it is brought to Sydney, at great expense, from the ranges close to the Victoria border, and solely for the use of the very best class of cabinet-makers.

One of the most valuable timbers yielded by the colony, and the merits of which are now only beginning to be fully appreciated—at all events, by architects\*—is undoubtedly Tallow-wood (*E. micrcorys*), so called from its greasy nature and its colour, which varies from a milky white to a dark, dirty yellow. The tree is a very large one, growing extensively in the forests north of Sydney, with an average height of 150ft., and a diameter of 33in., and having a persistent furrowed, fibrous bark. The wood presents a smooth surface, and a particularly close grain; while it possesses great strength and durability, splits with difficulty, and shrinks less in drying, and works more easily, than most of the hardwoods. It gives a beautiful face to the plane, takes nails and screws readily, and neither warps nor cracks. In the erection of road-bridges it stands next to ironbark, and for some descriptions of work it is regarded as even superior. For turned and carved work, such as verandah-posts and staircase balusters, handrailing, &c., it is absolutely without an equal among the whole of the hardwoods. Girders and piles of tallow-wood are known to have stood for twenty years without the least deterioration; while for bridge-decking this timber ranks as the very best, wearing well and shrinking but little. For the under-frames of railway carriages and waggon it is considered quite equal to the best Stettin oak; while for the purposes of paving-blocks it divides the honours with blackbutt, to which it is scarcely, if at all, inferior. (When blackbutt is not used in Sydney, tallow-wood is nearly always employed.) But of the many uses of

tallow-wood, perhaps the most important (because so exceptional) is its felicitous employment for the best class of internal floors, particularly those of ballrooms. For the last-named purpose its suitability is absolutely unique; but it should be always laid in narrow slips, not more than 3in. wide. This timber possesses the peculiar property that the friction of the feet in dancing causes the greasy substance to rise to the surface, producing a natural ballroom floor, as perfect as the floor of Willis's Rooms in London; yet the floor returns to its normal condition if unused for a few days. The natural greasiness of the wood, however, renders it unsuitable both for ships' decking and for cabinet work, as, in the first case, it will not hold the oakum, and, in the second, it exhibits a marked antipathy to glue. In its unseasoned state so great is this repugnance that it will not take the adhesive substance at all, and even when the wood is quite dry a perfect glue-joint is very difficult to make. Moreover, tallow-wood (like blackbutt, only in a greater degree) is peculiarly liable to the attacks of an insect, which bores into its substance minute round holes, known as "pin-holes," and these often damage the timber very considerably. Most of the hardwood borers seem to follow the grain of the wood in their insidious progress; but the depredators of tallow-wood, in the satisfaction of their ill-omened appetites, eat *through* the timber and *across* the grain, generally at right angles to it. But, in spite of these disadvantages, tallow-wood is an invaluable timber, and it is rightly estimated by those who are well acquainted with it as taking one of the highest positions in the timber wealth, not only of New South Wales, but of Australasia.

The timbers of the Box species (*E. polyanthema*, *E. hemiphloia*, and *E. melliodora*) are (again, like the blue gums) rather confusing, owing to the number of varieties that exist in different districts. The authorities, however, are pretty well agreed in classifying them under the three species the botanical names of which are given above. They are all tough, hard, interlocked in grain, and non-fissile, and consequently of little use to the architect, though very valuable to the engineer. They are not to be confused with the boxwood of the engraver, to which they have little actual resemblance or botanical affinity. The true red box (*E. polyanthema*) is of a dark red colour, particularly tough and interlocked, shrinking but little, and extremely durable. For many purposes it is altogether too hard, but it stands splendidly in the ground. Of the *E. hemiphloia* there are at least three varieties, though very closely allied—viz., the "box," or "grey box" of the coast districts, the "white box," which occurs further back, and the pink or light red-coloured timber of the southern coast, commonly called "red box." The white variety is especially serviceable for piles and girders (though it is said to suffer occasionally from dry-rot, and to stand indifferently in the ground), while the light red kind is particularly adapted for sleepers, and also for both road and railway bridges. The light-coloured woods are of great value in shipbuilding, for treenails, and for working into large screws, and likewise in the operations of the coachbuilder, the millwright, and the wheelwright, who employ them advantageously for heavy framing, and for the naves, felloes, and cogs of wheels. They are, however, very inflammable, furnishing locally a splendid fuel, which burns with great brilliancy, and generates a large amount of heat. They have a special use for such articles as mauls and the handles of tools, which need great toughness of wood for their proper manufacture, and they should answer equally well for the heads of golf-clubs, in the "Land o' Cakes." The Yellow Box (*E. melliodora*) rarely grows to any size in New South Wales, and in most of the districts where it occurs is subject to concentric gum-rings, which render it unsuitable for piles and girders. According to most of the authorities, however (though there is difference of opinion), it stands well both in the ground and in running water—such as in culverts, &c.; and it is likewise utilised very successfully for heavy framework, rollers, treenails, and the naves and cogs of wheels, though its exceeding weight and toughness are against it, in consequence of the great difficulty they give to the working. At Candelo, near the southern coast, yellow box is considered "the best timber all round."

The Brush Box\* (*Tristania conferta*), sometimes

\* This may possibly be due to the inferior timbers which are often dishonestly substituted for tallow-wood. A well-known expert asserts that he has "frequently seen shipments of timber to Sydney ordered as tallow-wood, and not containing a piece of that timber."—D. L.

\* "Brush" is a Colonial term signifying luxuriant vegetation—almost equivalent to the jungle of India.—D. L.



SUMMARY OF RESULTS OF TESTS OF NEW SOUTH WALES HARDWOOD TIMBERS, GIVING AVERAGE VALUES FOR EACH KIND OF TIMBER (PROF. WARREN).

Common Name.	Botanical Name.	Weight per Cubic Foot in lb.	Compression Tests.												Shearing Tests.
			Tension Tests.		Ratio of Length of Column to Smallest Dimensions.						Bending Tests.				
					24 to 1.		16 to 1.		8 to 1.				4 to 1.		
					Breaking Stress in lb. per Square Inch.	Modulus of Elasticity in lb. per Square Inch.	Breaking Stress in lb. per Square Inch.	Modulus of Elasticity in lb. per Square Inch.	Breaking Stress in lb. per Square Inch.	Modulus of Elasticity in lb. per Square Inch.			Breaking Stress in lb. per Square Inch.	Modulus of Elasticity in lb. per Square Inch.	
Red Ironbark	<i>E. leucosylon (sideroxylon) ?</i>	76.52	19,609	—	7,701	2,770,985	8,760	3,254,172	9,403	1,770,556	9,281	1,879,734	16,275	2,341,802	2,012
White Ironbark	<i>E. crebra</i>	73.55	9,861	—	6,923	2,459,460	9,103	2,747,521	8,225	1,938,865	8,680	1,612,544	16,932	2,794,020	1,974
Grey Ironbark	<i>E. crebra</i>	73.85	25,080	5,526,400	8,112	3,074,679	9,482	3,354,236	9,112	3,500,000	10,165	—	17,866	2,184,799	2,187
Stringy bark	<i>E. piperita (Eugenioides) ?</i>	71.33	19,399	2,761,812	5,685	2,128,870	5,565	1,810,923	6,575	1,790,161	5,985	1,234,169	13,931	2,353,044	1,942
Blackbutt	<i>E. microcorys (pilularis) ?</i>	66.69	21,708	3,105,979	6,572	2,343,185	7,756	2,649,063	7,526	1,775,249	7,522	1,734,698	13,725	2,162,764	1,757
Spotted Gum	<i>E. maculata</i>	62.19	14,413	4,383,483	5,499	2,793,579	6,456	2,927,980	6,561	2,028,058	6,753	1,820,432	13,296	2,056,101	1,583
Flooded Gum	<i>E. saligna</i>	77.94	14,887	3,761,988	7,494	2,483,221	8,889	2,179,183	8,700	2,055,027	8,761	1,779,584	17,422	2,341,130	1,976
Grey Gum	<i>E. tereticornis (goniocalyx) ?</i>	57.33	20,821	5,010,372	6,492	2,308,678	7,006	2,035,821	7,452	1,753,612	7,243	1,780,029	13,092	2,146,733	1,503
Forest Mahogany	<i>E. resinifera</i>	72.23	14,115	2,315,400	5,106	2,025,073	6,329	2,095,276	5,386	1,124,000	7,967	1,879,257	13,769	3,040,883	1,607
Swamp mahogany	<i>E. robusta</i>	75.98	16,520	—	5,263	2,524,987	6,113	2,559,386	6,569	1,796,229	6,846	2,494,505	12,124	2,098,701	1,166
Mountain Ash	<i>E. virgata (Sieberiana) ?</i>	66.57	18,974	2,902,000	5,197	1,962,851	4,903	1,575,852	6,324	1,590,076	5,959	1,690,651	11,527	2,054,227	1,812
Tallow-wood	<i>E. microcarys</i>	77.06	16,165	2,274,790	6,943	2,223,298	7,721	2,163,360	6,373	1,618,903	7,585	1,663,201	15,257	2,297,592	1,802
Grey Box	<i>E. polyanthema (hemiphloia) ?</i>	73.62	22,415	2,547,100	7,210	2,606,847	8,031	2,594,558	8,525	2,344,415	8,021	1,753,462	16,209	2,766,435	1,791
Woollybutt Brush Box	<i>Eucalyptus ? (Tristania conferta) ?</i>	63.89	19,968	4,495,266	5,542	2,605,892	6,121	2,303,768	7,074	1,935,845	6,981	1,314,657	12,768	2,140,443	1,729
Turpentine	<i>Synearpia laurifolia</i>	69.34	16,821	4,077,377	4,917	1,813,631	5,882	1,675,220	5,810	1,382,621	6,364	1,544,477	11,727	1,965,524	1,451
White Beech	<i>Gmelina Leichhardtii</i>	63.03	9,934	2,794,750	6,276	2,072,272	6,858	1,736,143	7,241	1,458,828	8,253	1,229,278	15,607	2,421,119	2,066
Red Gum	<i>E. rostrata</i>	62.19	8,884	1,292,691	3,370	987,364	5,655	1,498,591	4,651	1,381,447	5,016	581,601	6,930	761,769	1,122
Blackwood	<i>Acacia melanoxylon</i>	70.58	14,883	2,104,460	6,189	1,814,563	7,006	1,929,960	7,100	1,791,961	6,784	1,580,199	10,264	1,908,432	2,033

The hardwoods of the sister colonies will be next dealt with.

called "broad-leaved box" or "bastard box," and also known as "woollybutt," is of a totally different genus, though it belongs to the same Natural Order as the *Eucalyptus*. It is used largely for building purposes, being free in the grain and more easily worked than most of the hardwoods, though at the same time tough, strong, and durable. It is an excellent wood for agricultural implements, and, in smaller sizes, for tools (such as mallets and planes), and is expected to prove useful for paving-blocks. Its most valuable employment, however, is for tram-rails (at saw-mills, for instance), as the tram-wheels do not cut it; while for hewn trolley-wheels it is regarded as the best of all timbers. It is a fine tree, growing in the brush forests, and attaining a height of 150ft. and a diameter of 5ft., with a smooth brown deciduous bark. Ribs of vessels made of this timber have been found perfectly sound at the end of thirty years' service, and inch boards are often exposed to the atmosphere for months without warping; but that the wood warps and twists if felled all through the year (as is too often the case), and never seasoned, is notorious. In colour it is of a pale pink or brown, which turns grey upon exposure.

There are two other important New South Wales hardwoods which do not belong to the genus *Eucalyptus*, though one of them forms, like the *Tristania*, part of the Natural Order *Myrtaceae*. This is the turpentine-tree (*Synearpia laurifolia*), usually called simply "turpentine." It takes its name from the oleo-resin which exudes from its fruits and from beneath the bark. There are two classes of the tree: that growing on stony ridges and on the sides of mountains, and that found on the flats and low-lying ground, particularly about the northern rivers of the colony. The latter yields a very inferior class of wood, which warps and twists terribly; but the former furnishes a splendid timber of somewhat the same nature as the American greenheart (*Nectandra Rodicea*, Nat. Ord. *Lauraceae*, No. 178), growing frequently to a height of 200ft., with a diameter of 5ft., and a splendid, perfectly straight bole. It is an excellent wood for railway sleepers; but its principal employment is for marine piles, for which it is without a rival, and is almost exclusively used in Australia, as it defies the attacks of the *teredo navalis*. For this purpose, however, it should never be denuded of its bark. Its power of resisting the ravages of the destructive *teredo* was for a long time a matter of controversy; but recent investigations have shown that this invaluable quality is due, in a large degree, to the thin layer of resin existing between the bark and the sap-wood, which adheres to the bark, and is consequently removed if the timber be decorticated. It is this resin which is objectionable to the *teredo* or *colera*. The wood itself, however, is to some extent charged with it, so that it is only when pressed for sustenance that the insects attack it. But that they do so under such conditions is proved by the fact that piles denuded of the bark have occasionally been riddled by these pests. Another quality of tur-

pentine which should recommend it specially to architects is the exceeding difficulty of igniting it. It simply chars, and will not burn; and, notwithstanding the resin it contains, a turpentine log placed on a fire will frequently extinguish it. The wood is easily worked, but is extremely short in the grain, so that the breaking strain is somewhat low. In colour it is usually dark red, though it varies from brown to purple-brown.

The Beech (*Gmelina Leichhardtii*, Nat. Ord. *Verbenaceae*, No. 162), or White Beech, as it is generally called, on account of its white colour, is a splendid tree, growing freely all over the colony in the brush forests, and attaining a height of 150ft., with a diameter of 43in. Though much less hard and heavy than most of the hardwoods, it is, nevertheless, classed among them, and is a most highly-esteemed timber, being easily worked and very durable, little liable to be affected by the weather, and neither shrinking nor warping if only moderately seasoned; hence its fine white silvery grain makes it much prized for the flooring of rooms and verandahs and the decks of vessels. It is valuable for any purpose where a timber harder and more endurable than pine and softer than most of the hardwoods (and even than European beech) is required. For house-fitting and most ordinary carpentering purposes, white beech is scarcely to be surpassed.

Of the hardwoods belonging more properly to some of the sister colonies, but which are also found in New South Wales, little need be said here, as they will be dealt with hereafter. Manna Gum (*E. viminalis*), known also as "Ribbony Gum," and by several other names, is an inferior timber, and one to be avoided when coming from the mother colony. Both the red gums—the *E. tereticornis* (forest) and the *E. rostrata* (River Murray) are less associated with New South Wales than with Victoria, from the ports of which colony nearly all the red gum is, for geographical reasons, shipped. Blackwood (*Acacia melanoxylon*; Nat. Ord. *Leguminosae*, No. 74; Sub. Ord. 3, *Mimoseae*, or Gum Arabics) is a magnificent timber wherever it is met with. It is one of the ligneous glories of Victoria and Tasmania; but belongs only to the extreme southern portion of New South Wales and to the neighbourhood east of the Blue Mountains.

With reference to the hard woods generally, the following remarks as to the different ways in which the strength of these timbers is exerted are extracted from some data on the subject issued by Mr. Arvid Nilson, of the Surveyor-General's Office, New South Wales, for the information of those practically concerned in the selection and use of timber:—

"I. *The Tenacity along the Grain*, depending, as it does, on the tenacity of the fibres of the vascular tissue, is, on the whole, greatest in those kinds and pieces of wood in which those fibres are straightest and most distinctly marked. It is not materially affected by temporary wetness of the timber, but is diminished by long-continued

saturation with water, and by steaming and boiling.

"*The Tenacity across the Grain*, depending chiefly on the lateral adhesion of the fibres, is always considerably less than the tenacity along the grain, and is diminished by wetness and increased by dryness.

"II. *The Resistance of Shearing*, by sliding the fibres on each other, is the same, or nearly the same, as the tenacity across the grain.

"III. *The Resistance to Crushing along the Grain*, depending, as it does, on the resistance of the fibres to being crippled or 'upset' and split asunder, is greatest when their lateral adhesion is greatest, and has been found to be nearly twice as great for dry timber as for the same timber in the green state. In most kinds of timber, when dry, it ranges from one-half to two-thirds of the tenacity.

"Experiments made on the crushing of timber across the grain, which takes place by a sort of shearing, have led to the result that the timber is both more compressible and weaker against a transverse than against a longitudinal pressure, and consequently that intense transverse compression of pieces of timber ought to be avoided.

"IV. *The Modulus of Rupture* of timber, which expresses its resistance to cross-breaking, is usually somewhat less than its tenacity, but seldom much less.

"V. *The Factor of Safety* in various actual structures of carpentry ranges from 4 to 14, and is on an average about 10.

"VI. Among different specimens of timber of the same species, those which are most dense in the dry state are in general also the strongest."

The subjoined summaries are intended to show at a glance the various and respective purposes for which the invaluable hardwoods of New South Wales are best employed, as set forth in the present and preceding articles, and likewise to indicate the respective strengths of the hardwood and some other timbers, as determined by Colonel E. W. Ward in 1884, and later by Professor Warren in the series of tests alluded to in my first article. In closing this section of my subject, I desire to again accentuate the great superiority of the pale hardwoods of New South Wales, when properly felled, seasoned, and selected, over nearly every other timber used for the same purpose; and especially to caution English readers against being misled or prejudiced as to the character of these products by the comparatively worthless timbers that in the past have reached the English market from some of the other colonies.

DE LIBRA.

## SUMMARY OF THE PRINCIPAL USES OF THE HARDWOODS OF NEW SOUTH WALES.

Building.—*E. pilularis*, *E. maculata*, *E. saligna*, *E. resinifera*, *E. ammodendron*, *Gmelina Leichhardtii*.  
Ship-building.—*E. sideroxylon*, *E. piperita*, *E. crebra*, *E. siderophloia*, *E. saligna*, *E. maculata*, *E. resinifera*, *E. robusta*, *E. microcorys*, *E. hemiphloia*.  
Coach-building.—*E. maculata*, *E. sideroxylon*, *E. hemiphloia*.  
Bridge-building.—*E. crebra*, *E. goniocalyx*, *E. microcorys*, *E. hemiphloia*, *E. resinifera*.



Piles and Girders. — *E. crebra*, *E. siderophloia*, *E. paniculata*, *E. microcorys*, *E. hemiphloia*, *E. Maideni*, *E. acuminoides*.  
 Girders, but not Piles. — *E. capitellata*, *E. macrocoryncha*, *E. Eugenioides*.  
 Marine Piles. — *E. resinifera*, *Syncarpia laurifolia*.  
 Railway Sleepers. — *E. sideroxylon*, *E. siderophloia*, *E. capitellata*, *E. macrocoryncha*, *E. Eugenioides*, *E. saligna*, *E. robusta*, *E. hemiphloia*, *Syncarpia laurifolia*.  
 Railway Wagon Frames. — *E. capitellata*, *E. macrocoryncha*, *E. Eugenioides*, *E. microcorys*, *E. hemiphloia*.  
 Bridge Decking. — *E. microcorys*, *E. pilularis*, *Gmelina Leichhardtii*.  
 Paving-blocks. — *E. pilularis*, *E. microcorys*, *E. resinifera*, *Qy. Tristania conferta*.  
 Internal Flooring. — *E. microcorys*, *Gmelina Leichhardtii*.  
 Millwrights' Work. — *E. Sieberiana*, *E. hemiphloia*, *E. melliodora*.  
 Wheelwrights' Work. — *E. Maculata*, *E. saligna*, *E. Maideni*, *E. Sieberiana*, *E. hemiphloia*, *E. melliodora*, *Tristania conferta*.  
 Fire-resisting. — *E. capitellata*, *E. macrocoryncha*, *E. Eugenioides*, *E. saligna*, *Syncarpia laurifolia*.

In both this and the immediately following table I have mostly dissented the vernacular names as being insufficiently trustworthy. Those given by Col. Ward, indeed, are in many cases entirely different from those by which the timbers are now known in New South Wales. Even in Professor Warren's table the reader will do well to rely upon the scientific titles, taking into consideration the queries which I have added (in parenthesis) from the latest authorities. The scientific names, it should be borne in mind, have been determined, not simply from the nature of the timber, but from the complete botanical characteristics of the whole tree.—D. L.]

SUMMARY OF RESULTS OF EXPERIMENTS SHOWING THE PROOF TRANSVERSE STRENGTH, MODULUS OF RUPTURE, AND WEIGHT PER CUBIC FOOT OF NEW SOUTH WALES TIMBERS (COL. E. W. WARD).\*

Botanical Name.	Proof Transverse Strength,†	Modulus of Rupture,‡	Weight of a Cubic Foot in Pounds.
<i>Eucalyptus leucosydon</i> <i>sideroxylon</i> ?	401	9,144	73
<i>E. crebra</i>	344	8,568	69
<i>E. hemiphloia</i>	359	8,964	73
<i>E. siderophloia</i>	313	6,858	72
<i>E. saligna</i>	308	7,560	62
<i>Casuarina torulosa</i> forest oak; or <i>bestwood</i>	301	6,983	69
<i>E. tereticornis</i>	255	6,300	71
<i>E. rostrata</i>	276	6,174	59
<i>Casuarina stricta</i> forest swamp oak; <i>Syncarpia laurifolia</i>	273	6,048	63
<i>E. capitellata</i>	266	5,976	56
<i>E. melliodora</i>	259	5,796	66
<i>E. pilularis</i>	245	5,544	56
<i>E. resinifera</i>	238	6,300	70
<i>E. virgata</i>	236	5,118	60
<i>E. amygdalina</i>	224	4,842	68
<i>Tristania conferta</i>	210	4,785	61
<i>Casuarina suberosa</i> (swamp oak) ...	196	4,662	52
<i>Araucaria (unninghamii)</i> Moreton Bay pine	196	4,212	48
<i>Frenela robusta</i> , var. <i>verrucosa</i> white cypress pine	182	3,870	40
<i>Podocarpus elata</i> (colonial deal)	178	3,960	36
<i>Frenela robusta</i> , var. <i>microcarpa</i> Richmond Pine	174	3,870	39
<i>Cedrela Toona</i> , now <i>Australis</i> red cedar	140	3,296	28
<i>Grevillea robusta</i> (silky oak)	140	3,276	35
<i>Gmelina Leichhardtii</i>	140	2,898	38

\* The timber is in every case supposed to be dry.

† The Proof Transverse Strength is the weight in pounds avoirdupois which a bar of timber 1 in. square supported at two points 1 ft. apart, and loaded in the middle, is capable of sustaining without having its fibres of elasticity destroyed or impaired in any way. The Modulus of Rupture is eighteen times the load required to break the bar.

‡ The "oaks" will be dealt with in a subsequent article, as the comparatively small size which they usually attain renders them, as a rule, unsuitable for the more important purposes to which the hardwoods are applied.—D. L.

## NOTES ON DOMESTIC DRAINAGE.—IX.

### MANHOLE COVERS.

EVERY inspection and intercepting chamber should be provided with a movable iron cover, so as to allow of ready access to the drains when necessary. The cover should be as small as possible, provided that it is sufficiently large to permit a man of ordinary size to pass through conveniently. It may be either circular or rectangular on plan, but for ordinary domestic purposes rectangular covers are most frequently used as the curb or paving can be more easily fitted to them.

Manhole covers having a clear opening of 2 ft. by 1 ft. 6 in. or 1 ft. 8 in. diameter are a very convenient size for general use.

Fig. 32 shows a "ventilating" manhole cover suitable for situations where direct ventilation to the drains is required. A dirt-box is provided under the perforated cover to intercept the passage of dirt, stones, sticks, or other foreign substances which might otherwise enter the drain through the openings. The dirt box should be periodically taken out and emptied.

The common form of solid manhole cover is shown at Fig. 33. The frame is formed with a groove into which the cover is fitted. The groove may be filled with oil, glycerine, or indiarubber packing to prevent the passage of vitiated air



FIG. 32.

from the drain. For positions where the large surface of iron plate would be unsightly, as in yards, areas, &c., a solid sunk cover similar to that shown in Fig. 34 may be used, the centre portion being filled with concrete, tiles, wood-paving, or other material, so as to accord with its immediate surroundings.

In confined situations where it is necessary that increased precautions must be taken against the

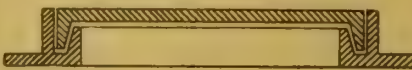


FIG. 33.

possible escape of any impure air from the drain, a "double" manhole cover should be used, an example of which is shown at Fig. 35. The detached inner cover is arched so as to allow the moisture from the drain to condense on its under side and run down into the groove, thus providing a water seal at that point. The space between the inner and outer cover may be filled with sand,

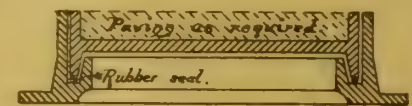


FIG. 34.

charcoal, or other suitable deodoriser if desired. Fig. 36 shows another form of "double" cover designed to admit of the centre portion being filled in with paving material similar to that of the adjacent surface. The grooved joint of the inner cover is sealed with oil or glycerine, and the space between the two covers filled with sand, charcoal, or other material. The joint of the



FIG. 35.

outer cover is deeply sealed with the water from the rains, or washing of the floors, but in dry situations oil or glycerine may be used.

### INTERCEPTING TRAPS.

In all cases where a trap or seal is required for drainage or sanitary purposes, it should be of the simplest possible form. It must be automatic



FIG. 36.

in action, and free from any liability to get out of order. A trap or seal dependent only on some mechanical arrangement should be avoided. The best and simplest form of trap at present devised is that known as the siphon trap with a water seal. The least effective water seal that should be permitted in any trap is 1½ in.

It may be incidentally mentioned that even a deep water seal cannot theoretically be considered

as constituting an absolute or perfect trap under all circumstances; but it fulfils every practical sanitary requirement, provided that the water seal is kept intact. It has been frequently demonstrated that minute quantities of certain gases, as ammonia, sulphuretted hydrogen, chlorine, &c., may, under very favourable conditions, pass through the water seal to the other side of the trap, but any such gas that has passed is infinitesimal in volume and quite innocuous. So far as it has yet been ascertained, no disease germs are able to pass through the motionless water seal of a good siphon trap.

A well-designed and effective intercepting trap for drainage purposes, in addition to being provided with a good water-seal to prevent the passage of sewer-air or gas from one side of the trap to the other, must be thoroughly self-cleansing. It should be free from any sharp angles, and perfectly smooth and even through-

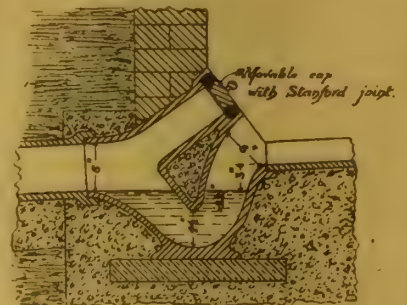


FIG. 37.

out, so that the surfaces may not become fouled, nor the trap liable to stoppages at any part of it when ordinary sewage matters are passing. The area of the exposed water surface on each side of the water-seal should be as small as practicable, to prevent any rapid evaporation of the water constituting the trap or seal.

It is also desirable that the trap should be so constructed as to provide a difference of level of at least 3 in. between the inlet and outlet. By this means a "cascade" or waterfall action takes place at the inlet, and increased velocity is given to the flowing sewage, so that it may more effectually overcome the frictional resistance necessarily offered by the form of the trap itself. In order to still further obtain an increased cleansing and scouring action through the trap, it is frequently formed with a slight contraction at the throat or lower portion of the passage of the trap. Fig. 37 is a section through a 6 in. intercepting trap of a good self-cleansing type, having a 3 in. cascade, 2½ in. water seal, and a contraction of 1½ in. at the throat.

In situations where only a slight general fall can be obtained for the drainage system, it is more important that all the available fall may be

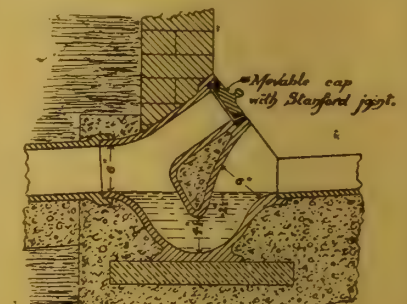


FIG. 38.

reserved for the drains themselves rather than utilise a portion of it for a waterfall action to the intercepting trap. Under such circumstances it is necessary to provide a trap in which the inlet and outlet are on the same level, as shown in Fig. 38, the cascade or waterfall being omitted. A cascade-action intercepting trap should, however, be used in all places where sufficient fall is obtainable.

### PLUMBERS' TRAPS.

All internal sanitary appliances, such as water-closets, sinks, baths, lavatories, &c., must be provided with some form of trap or seal near the outlet of the fitment. This is necessary even if



the discharge is carried directly into the open air through a short waste-pipe, in order that the external air may not be permitted to enter the building through the pipe. The interior of any waste-pipe is more or less fouled by constant use, and any air passing through it becomes contaminated, and rendered unfit for respiration.

The essentials of a good self-cleansing trap have already been given, and need not be

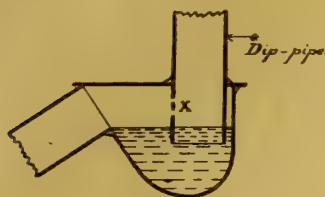


FIG. 39.

repeated. Plumbers' traps were at one time almost invariably of the form known as the "D trap," the general arrangement being as shown in Fig. 39. It is scarcely necessary to say that such a trap is insanitary in principle, and should never be used. The interior becomes coated with filth, which no amount of flushing will remove, and should the sides of the dip-pipe become corroded and perforated, as indicated at X, Fig. 39, the seal of the trap is entirely de-



FIG. 40.

stroyed, the vitiated air having free access into the building; though no outwardly visible indication of the danger is given.

Another most insanitary form of trap at one time greatly used for sink wastes was that known as the "bell trap" (see Fig. 40). It possesses a very shallow water seal, becomes thickly furred

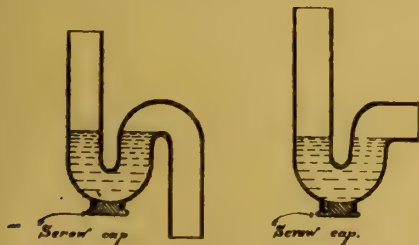


FIG. 41.

FIG. 42.

with passing waste matters, and is constantly liable to stoppages.

A simple and satisfactory form of trap is the ordinary "siphon trap," shown in Figs. 41 and 42. Another excellent type is that known as the "anti-D trap," made of refined cast lead (see Fig. 43). Both forms are self-cleansing, particularly the last named, as it is slightly contracted

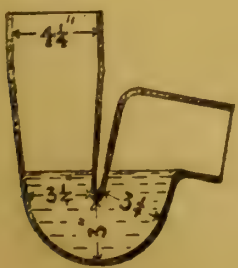


FIG. 43.

at the throat, in order to obtain an increased scouring action through the lower portion of the trap.

For pipes of small diameter, as the wastes from

lavatories, sinks, &c., the traps should be provided with a brass screw cap for inspection purposes, as shown in Figs. 41 and 42.

Lead siphon traps may be either hand-made,

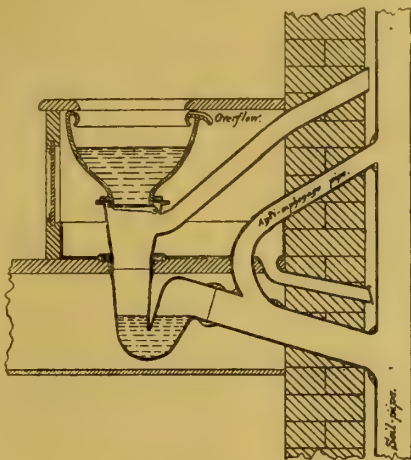


FIG. 44.

cast, or hydraulic drawn. Where lead traps are used, they should either be of the "anti-D" type, or those known as the Du Bois hydraulic drawn, perfectly smooth inside, and free from flaws of every description. The latter can be obtained in lead, varying from 6lb. to 8lb. substance. All water traps are liable to become unsealed by evaporation. The seal may also be broken by the water in the trap being siphoned or momentum out. To prevent siphonage of the water seal, all internal traps should be provided with an air-pipe near the top of the trap. This is known as an "anti-siphonage pipe." For scullery sinks, lavatories, and similar fittings, the anti-siphonage pipe must be taken direct into the open air, but for water-closets and house-maids'

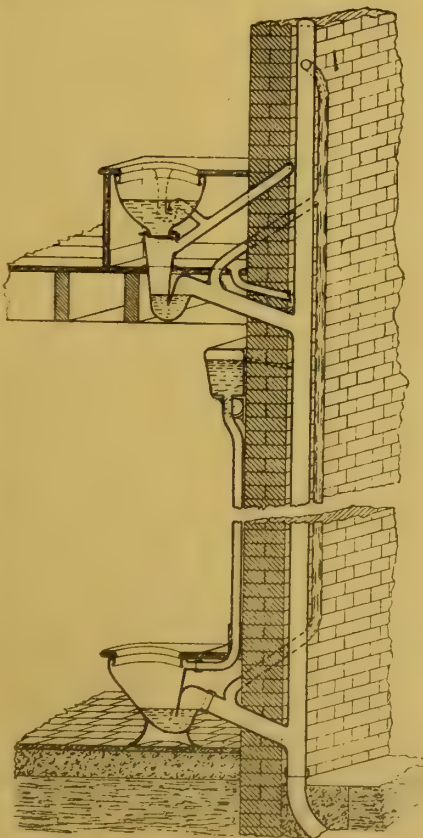


FIG. 45.

sinks such a method is not convenient, for it would necessitate the anti-siphonage pipe being carried above the eaves in the same manner as the soil-pipe. The same object, however, is attained by connecting the anti-siphonage pipe with the soil-pipe, as shown in Fig. 44. Where two or more closets are arranged vertically and discharge into the same soil-pipe, the anti-siphonage pipes must

be connected by means of a vertical pipe, and carried above the branch from the topmost closet before being joined to the soil-pipe. (See Fig. 45.) The vertical anti-siphonage pipe should be fixed outside the building as shown.

For water-closets and housemaids' sinks, a 1 1/2 in. or 2 in. diameter anti-siphonage pipe will generally be found sufficiently large, and 1 in. or 1 1/4 in. diameter for lavatories, scullery sinks, &c. The anti-siphonage pipe must not be fixed on the crown of the trap, but a little distance beyond, so as to avoid the liability of becoming choked (see Fig. 45). Where a perforated grating is fixed to the inlet of the siphon trap, as for scullery sinks, &c., the entrance to the trap should be enlarged, so that the effective discharging capacity of the grating may at least be equal to that of the inlet trap. The enlargement should take the form of an inverted cone.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE eleventh fortnightly meeting of the present session of the Institute was held on Monday evening, Mr. Alexander Graham, vice-president, in the chair. The deaths were announced of M. Emile Boeswillwald, of Paris, Honorary Corresponding Member, and of Mr. George Richmond, R.A., Honorary Associate. The Chairman called attention to the fact that the Library Committee had purchased, through Mr. B. T. Batsford, the valuable illustrated monograph, "S. Marco in Venezia," by C. Jacobi, edited by Ferdinando Ongania; the portfolios and letterpress would be bound, and would then be displayed for a month on the library table.

#### TESTS FOR BRICKWORK.

A series of papers, illustrated by numerous diagrams, tables, drawings, and photographs, and also by magic-lantern views, were read by Messrs. William C. Street, Max Clarke, Matthew Garbutt, and Professor W. Cawthorn Unwin, F.R.S., giving reports of the results of the first series of experiments which have been undertaken by the Science Standing Committee for the purpose of ascertaining the amount of resistance possessed by brickwork, whether set in mortar or cement, under severe crushing loads. In the first paper, Mr. STREET explained that the committee had thought it desirable to institute these systematic experiments, as no reliable data existed on the subject, and textbooks and authorities differed widely. The scheme had been primarily submitted to the committee by Mr. H. W. Burrows, and the details had been settled by a sub-committee consisting of Mr. Burrows, the late Mr. Henry Faija, and the author of that paper. After Mr. Faija's death, Professor Unwin and Mr. Max. Clarke had joined the sub-committee. It had been decided to confine the experiments to the materials now generally employed in building in the Metropolis, viz., London stocks, gaults, Leicester red, and Staffordshire blue bricks; to build two piers of each kind 6ft. high and 18in. square, using for one lime mortar, and for the other cement; thirty-two piers to be erected altogether, one half for crushing at the end of three months, and the other at the end of nine months. Mr. Street added that the committee's appeal for subscriptions to defray necessary expenses had been so poorly responded to, that the matter must have fallen through had not Sir William Arrol generously come forward and placed at their disposal a powerful hydraulic press, together with a massive testing machine expressly made at his cost for the committee's purpose. The site of the works, kindly lent by the West India Dock Committee, consisted of a piece of ground in front of the chief engineer's office at the docks, and close to the hydraulic engine-house, from which water at a pressure of 700lb. to the square inch was available. The work of building the experimental piers was commenced on 24th of July and finished on 13th August. They were built on little wrought-iron platforms resting upon a temporary line of rails about 140ft. in length and laid to a 16in. gauge. Over the rails were first placed wrought-iron plates, 2ft. by 2ft. 6in. by 3/4 in., one foot apart, with two holes drilled in the end nearest the testing machine, by means of which the piers were drawn along the rails to the machine. The bricks, lime, sand, and Portland cement used were of the ordinary description, the Portland cement being kindly given by Messrs. J. Bazley White and Bros., and the other materials being purchased in the usual way of Messrs.



Stiff and Sons. The piers on one side of the machine were in Portland cement mortar, and on the other in grey lime mortar. The cement mortar was mixed by measure in the proportion of one of cement to four of washed river sand, and the lime mortar in the proportion of one of lime to two of sand. The brickwork started upon a bed of mortar of the thickness of an ordinary joint, and rose about four courses to the foot. A theoretically perfect bond was not attempted, as it was thought best to keep to actual practice. Each pier had the joints struck with a weathered joint as the work proceeded, and was finished with a layer of mortar, upon which a sheet of felt was laid to prevent the top courses deteriorating from heavy rain. Messrs. Max Clarke, Francis Hooper, and Street superintended the building of the piers, and a record of progress was kept, so that the age of each pier at the time of testing could be ascertained. During the absence of the committee, while the work of building was in progress, the bricklayers filled in some of the piers of gaults and Staffordshire blue bricks with closers of ordinary stocks, and this being discovered, the building of these half-a-dozen piers had to be recommenced, and with fresh materials, and the tests remade. The testing commenced on December 9, and was completed on the 31st. The report went on to describe the crushings, and concluded with a series of tables giving full details of the results

TABLE OF RESULTS.

	In Mortar.		In Cement.		Average strength of single brick.
	Com-mence to fail.	Final collapse.	Com-mence to fail.	Final collapse.	
	Tons per sq. ft.	Tons per sq. ft.	Tons per sq. ft.	Tons per sq. ft.	Tons per sq. ft.
London Stocks	118	10.11	7.22	16.03	84.27
Gault	5.00	21.82	6.98	17.98	182.2
Ditto	6.16	22.03	7.08	17.51	
Leicester Red.	15.20	29.93	17.87	67.36	382.1
Ditto	16.11	31.55	21.82	49.54	
Staffs. Blue	22.43	69.22	29.45	84.47	701.1
Ditto	21.42	79.39	16.91	61.14	

arrived at. The committee considered that, though in some cases the results had been unsatisfactory, much new information had been gained which might be of great advantage to the profession. The six fresh piers to replace faulty ones had been built, and would be crushed at the end of four months, in order to give a complete estimate of the respective strengths for that period. The most important tests would be those at the end of ten months, as these would give the strength of brickwork when the mortar had matured.

Mr. MAX CLARKE followed with an interesting commentary on an instructive series of photographs of the piers taken by Messrs. E. W. M. Wonnacott and Howell, and shown by means of the oxy-hydrogen lantern. When the committee began the experiments at the West India Docks, they relied, Mr. Clarke explained, on the statements of ordinary textbooks, that London stock bricks required a pressure of about 40 tons to crush them, and thus were quite unprepared to see their first pier of that material begin to yield when the pressure, as indicated by the valve of the hydraulic press, denoted only a little over 4 tons per square foot, and collapse before they were ready to take full notes and photographs, or even to adjust the strain. Guided by this experience, they proceeded more cautiously and slowly with the subsequent tests, and photographed the piers directly signs of failure showed themselves. The symptoms of giving way were indicated by vertical fissures following the line of the closers, showing that here in every case was the weak point in the piers. Only in two cases did horizontal cracks show themselves, and there was not one diagonal crack noted in the mortar-built Leicester red pier. In all instances the fissures steadily widened till rupture ensued, and a frustum of material was left. The harder the material, the more complete was the ultimate disintegration. In the two harder descriptions of brick, the Leicester reds and Staffordshire blues, where mortar was used, a noteworthy sign of approaching collapse was the dropping of mortar all round the piers, due to its being squeezed out of the joints, and simultaneously a shortening of the pier by  $\frac{1}{8}$ th to  $\frac{1}{4}$ th of an inch in a height of 6ft. The harder the material, the more sudden and violent was the

final collapse, and the briefer the margin between signs of failure and total yielding. One pier of gaults was built only 14in. square, and, owing to its better bond, withstood a relatively much higher pressure than the other piers. All the bricks were wire-cut, and without frogs. The relatively greater strength of brickwork built in cement over that built in lime-mortar was very marked; but in some of the earlier work tested, the lime-mortar had not had sufficient time to set to any depth beyond the exposed surfaces.

Mr. MATTHEW GARRETT explained the behaviour, while under compression, of each of the piers experimented upon, and described a series of diagrams he had prepared from drawings he had made while the tests were in progress, illustrating the way the piers had collapsed. The vertical line of joints formed by the closers proved a plane of weakness in all the experiments, and it was generally at this line that the serious cracks first showed themselves. Pier No. 3, of gault bricks in mortar, was fairly typical of the rest. It bulged evenly and on all sides at once, nearly every brick in the body of the pier was broken, and the two pyramids at top and bottom, remaining after the crushing of the mass, were regularly defined, and approximately concentric with the axis of the pier.

The concluding paper was read by Professor UNWIN, and gave the results of his tests of the materials of which the experimental piers were constructed. (See foregoing Table of Results.) With the exception of some recent American experiments, there were, he said, no other known reports on tests of actual structural brickwork than those presented that evening. Taking four samples of each of the varieties of bricks used, he found the mean crushing strength of the London stocks to be 84.27 tons per square foot, Gault 182.2, Leicester red (half-brick) 382.1, and Blue Stafford (half-brick) 701.1 tons per square foot. Some of the bricks had to be cut in half, as they were too strong to be crushed in the 100-ton testing machine. Two specimens of Staffordshire Blue half-bricks stood even this test, and could not be crushed with 100 tons. Half-bricks were found to be markedly weaker than whole bricks, and might be expected to crush with about 25 per cent. less pressure than the same bricks tested as whole bricks. For gauging the relative strengths of lime and cement several specimens of briquettes were made and crushed, a few being reserved for testing at later dates. The tests gave mean results as follows:—Strength of lime briquettes (2 parts sand to 1 of lime by volume) at four weeks, 6.08 tons per square foot; at 12 weeks, 8.73 tons; at 24 weeks, 15.72 tons per square foot. Cement briquettes (4 parts sand to 1 of cement by volume): strength at 4 weeks, 31.45 tons per square foot; at 13.7 weeks, 48.52 tons; at 24 weeks, 56.15 tons per square foot. He showed that the ratio between the strength of various bricks and of pieces built up of those materials was by no means a uniform or a simple one, and could only be arrived at by further and still more elaborate experiments in the subsequent comparison and tabulation of results. Mr. Unwin concluded with a detailed description of the method adopted for determining the loads corresponding to the gauge pressures for the large hydraulic press, a point never ascertained hitherto except in an approximate manner. It was definitely fixed by noting the amount of gauge-pressure denoted for crushing copper cylinders of as nearly as possible uniform strength, and comparing this with the results shown by crushing the cylinders in an ordinary testing-machine. The amount of error in the reading of the gauge could not henceforth amount to as much as one per cent. The first result had been to show that whereas in the consideration of the structural stability of brickwork attention had been given only to the results of direct compression, it was now evident piers yielded owing to shearing or lateral tension, and that failure took place at an angle of 45° to the horizontal plane in homogeneous materials. He looked for still more interesting results when the tests were made on the piers that had been longer built up, and in which the mortar and cement were more thoroughly set.

Mr. DONALDSON, engineer to the West India Docks Co., said he had followed the experiments with much interest, and had found them most instructive. He was struck with the great difference between the strength of the actual brick and of the 6ft. pier. With the Leicester red bricks set in cement the latter failed at

67½ tons, whereas the brick itself needed more than 382 tons per square foot to crush it.

Mr. P. GORDON SMITH, architect to the Local Government Board, proposed a vote of thanks to the readers of the papers, together with Sir William Arrol and Mr. Donaldson for the valuable help they had given the experimenters. This only represented the beginning of a series of tests, of which the more important would be the later ones.

Mr. JOHN SLATER, B.A., in seconding the vote of thanks, said some error had obviously crept into the table of results in the case of gault bricks, in which those built in mortar were represented as much stronger than those set in cement, contrary to general experience and the tests on other bricks. He understood that the result as to the gault bricks in cement was vitiated by the fact that some stocks were introduced by the workmen. It was noteworthy that a half-brick would not carry so much weight in proportion to area as a whole brick, for the strength diminished as the ratio of height to area increased. This suggested to him that probably thicker stone templates were built in under girders than was necessary, and it would be conferring a benefit on the profession at large if Professor Unwin would carry out at South Kensington Central Institute a series of experiments with slabs of Yorkshire stone and other homogeneous materials to determine the ratio of breadth and width to thickness that gave the maximum resistance to crushing and shearing.

Mr. W. EMERSON questioned very much if a different result would not be obtained by a crushing weight suddenly applied to a pier in a hydraulic press to that gradually applied by the accumulation of goods in an actual building.

Mr. BERNARD F. DICKSEE said the weakness of piers was obviously in the closers, as here the signs of failure first showed in vertical cracks. It had been suggested that experiments should be made on a line of walling built in various loads, but sufficient funds had not been forthcoming to render such very desirable test practicable.

Professor ARCHIBSON, A.R.A., thought one reason the mortar-built piers of stock brick failed under such slight pressures was because the mortar had not set. In most of the failures of ordinary brickwork which had actually come under his observation, the fault lay in loading warehouse floors with goods before the mortar had had time to set, and even before the roofs were on. In his early days he made some practical experiments with 9in. by 9in. cubes of bricks which were built in mortar and cement, and allowed to stand some years. They withstood much greater pressures than were recorded that evening, as was only to be expected when they considered the greater time given, and that they were 9in. cubes against piers, 6ft. high and only 18in. square. Cement was a stronger and more trustworthy material than mortar, except in the presence of fire, when it was liable to fly, so that for use as a fire-resisting substance lime mortar had advantages.

Mr. F. WALKER said that, as a practical clerk of works, he considered the weak point in the tests was the bond adopted. In the United States it was customary to use a  $\frac{1}{4}$  bond throughout, with headers throughout every third or fifth course. In Dutch bond the closer was done away with, and so a source of weakness was avoided. The American bricks were broader and better than English ones.

The CHAIRMAN then put the vote of thanks, which was carried by acclamation, and appealed for further funds to carry on the series of tests in which, for once, he remarked, architects had been able to teach engineers some practical points.

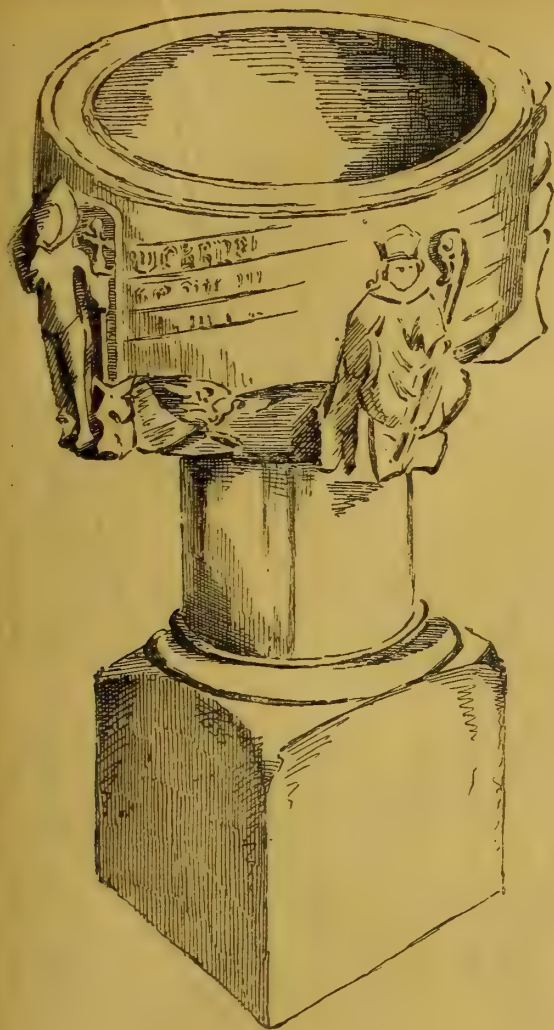
## THE ECCLESIASTICAL ARCHITECTURE OF SCOTLAND.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

UNIFORM in scope and character with their admirable and exhaustive work on "The Castellated and Domestic Architecture of Scotland," Messrs. David Macgibbon and Thomas Ross have issued the first volume of a series dealing with "The Ecclesiastical Architecture of Scotland from the Earliest Christian Times to the Seventeenth Century," and we are to-day enabled to give a fairly good idea of the practical

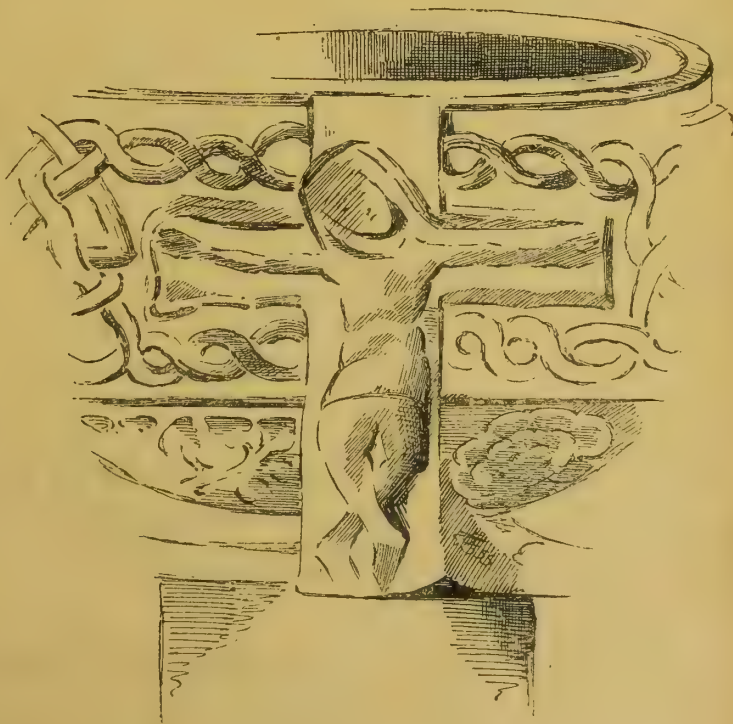
\* The Ecclesiastical Architecture of Scotland from the Earliest Christian Times to the Seventeenth Century. By DAVID MACGIBBON and THOMAS ROSS. Vol. I. Edinburgh: David Douglas. 1896.





FONT · ST· MALRUBE · LOCH AOINEARD · SKYE ·

FROM "THE ECCLESIASTICAL ARCHITECTURE OF SCOTLAND"

BY MESS<sup>RS</sup> MACGIBBON & ROSS ·

style of the illustrations which the book contains by reproducing a selection of the author's drawings among our lithographic plates. A very desirable distinction is wisely determined on between the province of archaeology and the art of architecture, and interesting as such objects as ancient sites and demolished buildings may be, they are only incidentally referred to, the main idea of the work being to record only the existing examples of church architecture discoverable in Scotland. The attempt is made at the outset of the book to compare the distinguish-

ing characteristics of Scottish church design with those of other countries. Practically, however, the various orders of churchmen appear in Scotland, at any rate, to have made but very little difference in the style of architecture in vogue generally for ecclesiastical work from the 12th to the 16th centuries. The churches and monasteries, the authors tell us, were all built upon well understood principles in common use, and whether the occupants of the religious houses were canons regular, or monks of the Cistercian Tyronensian, Premonstratensian, or other order,

or even Franciscans or Dominicans, their convents were designed on one recognised system. The plan consisted of an open cloister surrounded by a covered walk, having usually on the north side a church, while on the east side, in connection with the transept, lay the sacristy, chapter house, and frequently the fraterie or dayroom of the monks, on the upper floor of which range extended the dormitory, library, &c. On the south side of the cloister were situated the kitchens and refectory, the lay brothers' and guests' apartments being located to the westwards of the quadrangle.



These dispositions were sometimes extended and modified, but on the whole these arrangements were generally adhered to. None of the Scottish monasteries, however, are sufficiently intact to exhibit these establishments in their entirety; but the various ruins which survive always correspond with the parts which would be expected to be found in the positions they occupy. The rise and fall of Celtic art in Early Christian times forms the first phase of artistic development in Scotland's history, and the second is allied to the various stages of general European culture. The round towers and runic sculptures preceding the primitive attempts at Norman work correspond very closely with Irish examples. The small parish churches and one cathedral represent the round-arched Romanesque, and the succeeding pointed styles of Gothic are well illustrated, though the number of "Decorated" buildings, owing to the disastrous situation of the country which prevailed during the 14th century, is comparatively small. The 15th and 16th centuries exhibited more individuality of style, with influences both from the French "Flamboyant" and the English "Perpendicular." The political and commercial connection with the Netherlands and with France distinctly established a peculiar mannerism, which has already been pointed out in the history of Scottish building, and it is this last mode or period of work which seems to possess the greatest individuality and charm, particularly as it develops into the Renaissance.

Tracing the history of the Catholic Church in Scotland back to the 4th century, the name of St. Ninian, a Briton missionary, still survives, and emissaries of the school of clerics with which his name is associated were, in the 5th century, probably identified by the dedication still extant, but which originally were common amongst the churches of the Picts, as, for example, St. Ternan, at Banchory-Ternan; St. Mochmuc, at Inchmahome, and St. Fillan, on Loch Earn. The caves and cashels and pillar stones with incised crosses are common to both Scotland and Ireland; but symbolic sculptures representing hunting scenes, grotesque animals, &c., so usual in Scottish monuments, are almost entirely absent from those of Ireland. Adam and Eve, the Sacrifice of Isaac, Jonah and the Whale, Daniel in the Lion's Den, are common Scottish subjects of the kind. As the influence of the Church spread, and the Irish missionaries established stations off the West Coast of Scotland, so in due time the monastery at Iona sent out missionaries in all directions. It was the nursery of learning and piety, and many of the pre-Conquest churches of Northumbria which still survive show traces of how religion flourished in the country. Architecturally, these early buildings have some peculiarities, such as the height of the walls as compared with the width of the building. The square western towers are common in these structures, and the jambs of their doors and windows often incline like those of Ireland, and in some Scottish churches these features may still be seen. Without attempting to follow the history of the early church, or seeking to trace the differences between the Columbian and Roman missionaries, we may note that in the volume before us much information is afforded, in so far as this question concerns the subject-matter of the book, and accompanying the introductory chapter are several drawings of monuments from the Island of Oronsay, Islay, Iona, St. Madoc's, Perthshire, and Logierait and Rossie Priory in the same county. The authors, for reference sake, having traced the course of the influences which affected the primitive ecclesiastical structures of Scotland till the time when the Irish influence was superseded by that of Rome, furnish the reader with a review of the origin and development of the Norman style, and of the various styles of Gothic work which succeeded it. This part is accompanied by reproductions of well-known examples from Britton's "Cathedrals and Antiquities," and also from Viollet-le-Duc's Dictionary. The late Mr. T. S. Muir's works and peregrinations, as described in his "Characteristics of Old Church Architecture of Scotland," and in his "Ecclesiastical Notes on some of the Islands of Scotland," are brought into contribution, and examples are delineated in this good useful company from Eilean Naomh, Skeabost Skye, Mugstot, Teampull, and other Celtic remains and dry-built primitive churches, as at Tigh Beannachadh, Dun Othail Lewis, Kilmory, and the round-towered churches in Orkney. St. Serf's, Dunning, Perthshire, in Lower Strathern, is a place of very early origin; but the church from which we give a view of the

tower was not built till the early year of the 13th century, and to this period the tower is assigned. Its western position is shown by the plan given on our plate. The tower is similar to those at Muthill and Dunblane, though it is much later in date. The tower arch into the nave is a sharply pointed one of rich character. The building has been much altered, and the north doorway, as will be noticed by the sketch in the top left-hand corner of our sheet, has been nearly concealed by an outside staircase being built across it. Dunfermline Abbey, situated north of the Forth, in the heart of the old Pictish kingdom, stands probably on the site of the original church of Malcolm, and followed the erection of Durham Cathedral by some twenty-five years. David I. was associated with the new monastery, and is said to have added the nave, of which we illustrate a view looking west. There are very many other drawings of this building, and the fine traceried window of the refectory is by no means the least interesting of the series. The old buildings to the north-west of the church, known as the Queen's House, and the Bailie and Constabulary House originally, are now represented by the picturesque group of 17th-century residences, of which the accompanying sketch gives a capital idea. The interior length of the church is 268ft. 6in., and the length of the exterior 280ft. It occupies a lofty and commanding situation, and considerable remains of the monastic precincts still exist. The "Pend Tower" was built after the refectory was finished, as it abuts against the westmost buttress in a way which it would not have done had the whole been of one construction; also the corner buttress has been cut away, as may be seen at the right-hand side of the interior sketch which we give of the upper room of the "Pend Tower." The grand mass of Kirkwall Cathedral is the chief object which meets the view from the sea. The town only gradually comes into sight, with its harbours and quays; the huge church overtops everything else. The interior, recalling a French church rather than an English one, by reason of its western portals, is striking and impressive. The authors furnish several drawings and plans. We have reproduced the longitudinal section of the cathedral among our selection to-day. The last subject to be named is the well-known and well-preserved church at Leuchars, the choir and apse really forming the chief points of interest. The building is situated near St. Andrew's. The choir is 19ft. 9in. long by 18ft. wide, with a circular apse 12ft. 6in. wide and 12ft. deep. The external arcade is in two stories, the shafts of the upper resting on the arches of the lower one. The shafts of the bottom arcade are double, those above having a wall pier between. All the arches are enriched with chevron and billet mouldings. Grotesque heads form corbels to the crowning cornice.

We have thus only touched upon some of the earlier examples of Gothic, Transitional, and Norman work. Jedburgh, Dundrennan Abbey, Coldingham Priory, and Dryburgh Abbey, all fine examples of 13th-century work, are reserved for the second half of the present volume, which is the first of a series of three which promise to prove not only a valuable addition to the history of Mediaeval architecture, but as a work of ready reference, in which all that is best in Scottish ecclesiastical buildings is brought together, these books will be as useful as they must be entertaining. The binding corresponds with the same authors' "Castellated Architecture," and the size of the volumes is uniform.

The Trustees of the British Museum have appointed Mr. Charles H. Read to the post of Keeper of the Department of British and Mediaeval Antiquities, in succession to Sir Wollaston Franks, who was lately superannuated. Mr. Read has for some years been the Assistant Keeper of the Department, and is hon. secretary of the Society of Antiquaries.

An organ built by Messrs. Norman and Beard, of Norwich, was dedicated last week in the parish church of Coddensham, Suffolk. The oak case has been designed by the Rev. Ernest Geldard, of Little Braxted, near Witham, Essex, who also planned a few years ago the organ-chamber in which it stands.

On Thursday in last week Dr. R. Bruce Low, a Local Government Board inspector, conducted an inquiry at the municipal offices, Southampton, in respect to the application of the council for sanction to borrow money with which to purchase 10½ acres of land as a site for an infectious diseases hospital at Mousehole-lane, Millbrook, Southampton.

## OBITUARY.

MR. JAMES COSTER EDWARDS, J.P., D.L., of Trevor Hall, Llangollen, the proprietor of the extensive brick, tile, and terracotta works at Ruabon, and, indeed, the pioneer of the terracotta industry, died on Thursday in last week at St. Peter's Port, Guernsey, where he had gone for a change. Mr. Edwards, who was 67 years of age at the time of his death, acquired little more than a quarter of a century since, a piece of land at Pen-y-bont, on which stood a single small shed in which some half-dozen men were at work making bricks from the now well-known bed of red clay. By his energy and enterprise, Mr. Edwards developed the capabilities and resources of the district, and erected a large manufactory in which over 600 hands are employed in preparing terracotta to be despatched to all parts of the world. Before the Ruabon works were started, Mr. Edwards had been for at least fifteen years making sanitary ware at the Trefynant, and more recently he opened a new manufactory at Rhos for glazed and enamelled bricks, and others for tessellated, encaustic, and artistic tiles, finding employment at all these places for over a thousand persons. In 1892 Mr. Edwards served as high sheriff of Denbighshire, of which county he had long been a justice of the peace, as well as in recent years, and until his death, a member of the county council; he was also chairman of the Llangollen School Board. We gave his portrait in our issue of April 11, 1890.

## CHIPS.

Mr. J. T. Irvine has again been appointed by Mr. Pearson, R.A., as the architect's clerk of the works in the impending restoration of the west front of Peterborough Cathedral.

The fall of a disused factory chimney at Burnley was the subject of an action at Liverpool Assizes on Friday. A tradesman whose premises were extensively damaged by the chimney in its fall sued the owners of the mill for compensation. The jury awarded him £175.

What was believed to be the largest pine tree in Wisconsin was cut down a fortnight ago at Antigo. It was well known as a landmark. Several years ago the top was blown off, leaving the trunk standing. This trunk measured 22ft. in circumference, and proved to be 150ft. in length. It was 2ft. in diameter at the top. The full length of the tree was 260ft.

On Wednesday week, Mr. J. Smith, "the Lancashire Steeple Jack," razed a chimney shaft in connection with the works of Messrs. Buckley and Brennand, bleachers, of Seedley, near Manchester. The chimney was about 200ft. in height, and about 1,800 tons in weight.

In the case of the application for discharge from bankruptcy of George William Stubbs, of Fanthorpe-street, late Erpingham-road, Putney, builder, the discharge has been suspended for seven years ending Feb. 3, 1903.

A stained-glass window has just been placed in the south aisle of the nave of St. George's R.C. Cathedral, Southwark, in memory of the late John Oxenford, dramatic critic to the *Times*, who died in 1877. The paintings represent incidents in the traditional life of St. George, as revealed in a window erected in the pre-Reformation Church of St. Neots, Cornwall, which dates back to about 1250. The upper left panels represent St. George being taken prisoner, and being beheaded before the shrine of Our Lady, and Our Lady restoring him to life. The lower left panels show how, at the prayer of the Princess, St. George goes forth to fight the dragon. The centre panel is a representation of the slaying of the dragon. The upper right panels represent the charge of high treason, the lower right panels the beheading of St. George, and finally the Saint bearing his banner, and his reception in heaven. The work has been carried out from the design of Messrs. Lavers and Westlake, of London.

The City Court of Common Council have adopted plans by the City surveyor, Mr. Andrew Murray, for the erection of shops on the western and southern sides of the fruit and vegetable market, with frontages to Farringdon-road and Charterhouse-street respectively, at an estimated cost of £9,000.

The foundation-stone of a new board school was laid in Ings-road, Wakefield, on March 26. The buildings, together with the site, will cost about £12,000. The school will accommodate 600 scholars, with possible enlargement at some future time for 240 more. The school is being built in stone on the central-hall plan. The central hall will be 91ft. by 40ft., with a height of 31ft., and there will be three classrooms on each side of the central hall 26ft. by 24ft., and 14ft. 8in. in height. Dados of glazed bricks are being formed, and some of the floors will be of wood-block and concrete, and others boarded. Mr. Thornton is the architect, and the chief contractor is Mr. Denholme.



## CONTENTS.

Architects and Craftsmen .....	479
Raw Buildings and Ripe Ones .....	480
Royal Society of British Artists .....	481
Banks' Fireproof Construction .....	481
The Timbers of Australasia.—IV. ....	482
Notes on Domestic Drainage.—IX. ....	484
Royal Institute of British Architects .....	485
The Ecclesiastical Architecture of Scotland .....	486
Obituary .....	488
The Building News Directory .....	XL
Our Illustrations .....	489
Building Intelligence .....	508
Competitions .....	508
Architectural and Archaeological Societies .....	508
Architectural Education in London .....	509
The National Portrait Gallery .....	509
Cast-Iron in Builder's and Contractor's Work.	
—XX. ....	510
Correspondence .....	511
Intercommunication .....	511
Legal .....	511
Legal Intelligence .....	512
Parliamentary Notes .....	512
Statues, Memorials, &c. ....	512
Our Office Table .....	513
Trade News .....	514
Tenders .....	514

## ILLUSTRATIONS.

"THE LAMENT OVER THE DEAD CHRIST."—WAREHOUSES AND OFFICES, MANCHESTER.—ECCLESIASTICAL ARCHITECTURE OF SCOTLAND.—GREENBANK BOARD SCHOOLS, BRISTOL.—RESIDENCE AT CEFN COED, CARDIFF.—BELGIAN SHUTTER WORK.—INFANTS' SCHOOL AT AMBLER THORN.—ST. MARK'S CHURCH, STAINBURN, YORKS.—DECORATIVE FURNITURE OF THE LATE SIR EDEN D. PAUL.

## Our Illustrations.

"OLD MASTERS" ON THE CONTINENT: NO. XXXII.  
—"THE LAMENT OVER THE DEAD CHRIST."

No more fitting subject could be well chosen for illustration on Good Friday than this masterpiece of the great Flemish painter, Barent Van Orley, whose portrait, by Albert Dürer, we published on Feb. 22, 1895. The Holy Women and some of the Apostles are depicted gathered round the body of their Master after His removal from the Cross on Calvary, and the artist, with pious sympathy, has realised the dire distress which must have marked that sacred scene. The influence of Raphael, under whom Van Orley studied in Rome, is very marked in the composition of this picture. In company with Michael Coxcie, Van Orley had the superintendence of the manufacture of the tapestries of the Vatican, made from Raphael's cartoons for Leo X. Some of the windows in the Church of St. Gudule, at Brussels, were executed from Van Orley's designs. He likewise painted in *tempera* as well as oil, and the brilliancy of some of his paintings is attributed to his having frequently worked on a gold ground. As Court painter to the Emperor Charles V. he enjoyed social advantage, and he was in the service of Margaret and Mary, Regents of the Netherlands. He is known also as Bernard Van Brussel, and sometimes is called Bernard van Orley. His birth is uncertain; but about 1491 is the date usually accepted as correct, and Brussels, where he died on Jan. 6th, 1542, was his native city. He is said to have visited this country. We have only one specimen of his skill in the National Gallery—viz., "The Magdalen Reading," a half-figure painted small life-size. It was purchased in Paris in 1860, and is painted on a wood panel. The Magdalen is represented dressed in a crimson velvet robe, looking into an illuminated volume; on the table before her is a vase. "The Lament over the Dead Christ" is in the Royal Gallery at Brussels, and our illustration to-day is taken from a photograph of the original picture, taken by M. Franz Hanfstaengl, of Munich.

## WAREHOUSES AND OFFICES, MANCHESTER.

THESE warehouses and offices have been recently erected in George-street and Dickinson-street, Manchester. They are practically three separate buildings, although forming one block. Each floor is divided into several complete suites of offices and warehouses, tenanted by various shipping firms and merchants, who all have their goods pressed into bales in the basement by powerful hydraulic machinery previous to exportation. The buildings are faced up to the first-

floor cornice with Cullingworth stone, and above that height with similar stone dressings and red pressed Ruabon bricks. The buildings have been erected from the designs of Mr. I. R. E. Birkett, A.R.I.B.A., Manchester.

## ECCLESIASTICAL ARCHITECTURE OF SCOTLAND.

(SEE description and further sketches on p. 486.)

## NEW ELEMENTARY SCHOOLS AT GREENBANK, NEAR BRISTOL.

THESE schools are being built for the St. George School Board, from the designs of Mr. F. Bligh Bond, A.R.I.B.A., of Liverpool Chambers, Bristol, at a cost of £9,298. Mr. F. Martin, of St. George, Gloucestershire, being the contractor. The schools include an infants, and a boys' department on the ground floor, and a girls' department above the boys; central halls, 50 by 36ft., are provided for boys and girls. The walls are faced with local pennant stone, and the dressings are of free-stone, supplied by the Bath stone firms. The roof is of green slates. The building is to be heated and ventilated on the system patented by the Blackman Co.—viz., propulsion of warm moistened air by a fan, through trunks, into every room. The scheme includes a caretaker's house, and cookery centre.

## RESIDENCE AT CEFN COED, CARDIFF.

THIS house has recently been built on a newly-developed estate at Cefn Coed, near Cardiff. The whole of the walls are built with local stock bricks, the external walls being built on the cavity principle, and faced with Cattybrook wire-cut bricks. The upper portion of the building is tiled with Brosely strawberry-coloured hanging tiles, whilst Brosely dark brindled tiles are used for the roofs. The situation being an exposed one, teak is used for the whole of the window frames and casements, which are glazed with clear leaded lights. Ornamental plaster and framed timber work are sparingly introduced in the gables. The architect is Mr. Edwin Seward, F.R.I.B.A., of Cardiff, and the contractors for the work are Messrs. E. R. Evans and Bros., of the same town.

## BELGIAN SHUTTER WORK.

THE shutters shown on the accompanying sheet of sketches are from an old house in Malines. The four plain ones are of oak, and open on double hinges, the inner portion being in two leaves, and hinged again. The escutcheons, hinges, and hasps (of a somewhat elaborate character) are shown on the drawing to a larger scale. They are of wrought iron, tinned—as was usual in work of this character—to prevent rust. The total width is 5ft. 10½in., and the height 5ft. 2in. The linen-pattern panels, also from the same place, terminate somewhat unusually at top and bottom with a boldly-carved conventional flower, to receive which the mouldings are cut back and shaped. The double panels, of which there were twelve in number, measure about 1ft. 9½in. wide, by 1ft. 10½in. high. All the above were sketched and measured at Christie's Sale-Rooms. The quaint little French panel, about 11in. by 7in., comes from an oak pulpit from Brittany, and is Early 16th-Century in date.

## INFANTS' SCHOOL AT AMBLER THORN, NEAR QUEENSBURY, YORKSHIRE.

THIS village school was completed last year for the Northowram School Board. It stands in a very exposed situation, about 1,500ft. above sea-level, and the natural level of the site being about 9ft. below the level of the road, the architect has taken advantage of this and formed covered playgrounds under the school, thereby affording protection to the children. The external walls are of local flat-bedded wallstones, lined inside with brickwork and plastered, and a coloured glazed-brick dado. The floors are of wooden blocks upon concrete and rolled steel. The roofs are covered with green Buttermere slates. Accommodation is provided for 120 infants, and the total cost is about £1,100, including extensive boundary walls. Mr. Joseph F. Walsh, of Halifax, is the architect.

## ST. MARY'S CHURCH, STAINBURN.

THIS design was proposed to be erected on the site of the ancient dilapidated church of Stainburn, near Leeds; but circumstances necessitated a restoration of the old building, which has just been completed. The material intended to be used were local stone for walls and flag roofing (or dark-red tiling), the roof, to be open, of

rough-sawn oak. The design is by Mr. W. R. Gleave, A.R.I.B.A., architect, Croydon.

## DECORATIVE FURNITURE OF THE LATE SIR E. J. DEAN PAUL, BART.

THE Chippendale cabinet which is shown in the centre of the accompanying illustration is altogether a choice piece of furniture, as attractive in design as it is admirable in workmanship. It is of mahogany, delicately carved in places, and shaped in a very graceful manner. The lower part consists of a secretary inclosed with a fall-down front, and four shaped drawers beneath fitted with brass handles and escutcheons. We give a slight sketch showing interior arrangement of secretary, and an additional sketch showing the space inclosed by the folding-doors above, with its useful provision of drawers, pigeon-holes, &c. The piece stood 9ft. 6in. high, and was 3ft. 9in. wide, and was sold by auction for 166 guineas. The Chippendale mahogany chair, one of a set of six which fetched 105 guineas, has an elaborately fashioned back, scroll-shaped seat, and curious shaped legs and front rail. There was an unusual amount of very fine Chippendale furniture, which was knocked down for high prices. The Dutch marqueterie armchair (one of a set of six which was sold for 135 guineas) was also a very delectable piece of furniture, the back being inlaid with bouquets of flowers, and the seats covered with old French tapestry, illustrating some of Esop's Fables. These objects were sketched at the sale-rooms of Messrs. Christie, Manson, and Woods.

## CHIPS.

THE partnership heretofore subsisting between J. H. Morewood and A. B. Tinker, architects and surveyors, of Southampton-row, W.C., trading under the style of Tinker and Morewood, has been dissolved, as has also that hitherto carried on by A. G. Latham and C. W. Bosworth, architects and surveyors, Birmingham, under the style of Latham and Bosworth.

A movement is on foot for the restoration of the Church of St. John Baptist, at Hale Magna, near Seaford. The church has for many years been in a dilapidated condition, and for twelve months past it has been closed. Of the estimated outlay of £1,600 required, nearly £1,000 has been promised. The work proposed to be done includes a new roof to the nave and south aisles, new floors, new seats, repairs to the tower and pinnacles, re-casting and re-hanging the bells.

The town council of Aldeburgh, Suffolk, have elected Mr. John C. Gordon, assistant building inspector to the Southport Corporation, as surveyor and inspector of nuisances.

New departments for girls and infants have just been added to the Lancastrian board school in Bowling Green-street, Sheffield. The additional buildings are of two stories in height, and consist, on the ground floor, of an infants' room and four classrooms, and on the floor above of an assembly-room for girls and three classrooms. The cost has been £6,602. The architect was Mr. C. J. Innocent, of Sheffield, and the warming and heating apparatus is by Mr. W. Key, of Glasgow.

By the disastrous fire that occurred at Lille on Saturday night, the fine church of St. Sauveur, with its tower—the last remnant of the ancient ramparts of the town—was totally destroyed, as well as a wing of the hospital.

At a meeting of the inhabitants of the Isle of Wight on Saturday afternoon, it was reported that sixteen proposals had been received for a local memorial to Prince Henry of Battenberg; but a scheme which included the restoration of the chancel of Carisbrooke Church, suggested by Sir Charles Seely, who offered to support his proposal with a donation of £1,000, found most favour. This scheme was adopted by a very large majority. It is estimated that the redecoration of the chancel, with a small additional memorial at the castle, will cost £2,000.

The Baptists of Leicester have decided to raise £10,000 in order to erect chapels in two of the most densely-populated districts of the borough—those of Catherine-street and North Evington.

New union offices at Townhend, Rochdale, built for the Rochdale board of guardians, from plans by Messrs. S. Butterworth and Duncan, of that town, were formally opened on Wednesday week.

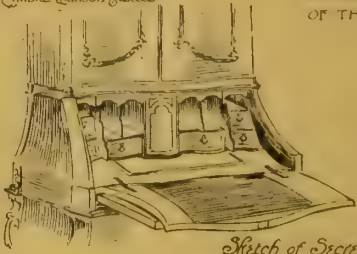
The urban district council of Southborough have approved of block plans for proposed gasworks, prepared by Mr. Corbet Woodhall, C.E., and have instructed Mr. Woodhall to proceed at once with working drawings and specifications.

Mr. Henry Ives Cobb, of Chicago, has been appointed by the Secretary of the United States Treasury architect of the new post-office buildings for Chicago.

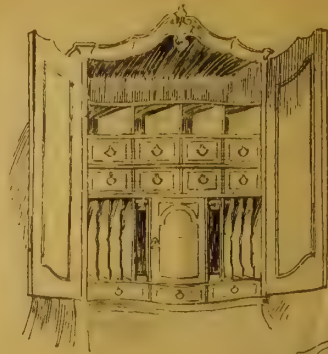


Sketches of the Side Rooms  
of Messrs. Christie Manson & Woods

# DECORATIVE FURNITURE OF THE LATE SIR EDWARD J. DEAN PAUL BART



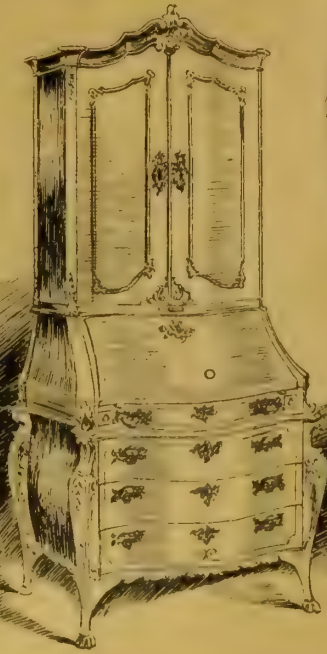
Sketch of Secretary  
of Cabinet



Sketch showing  
Interior arrangement  
of Cabinet



Chippendale Hall Chair



Chippendale Cabinet

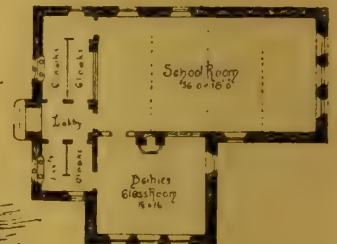


Dutch Dorsetshire  
Arm Chair

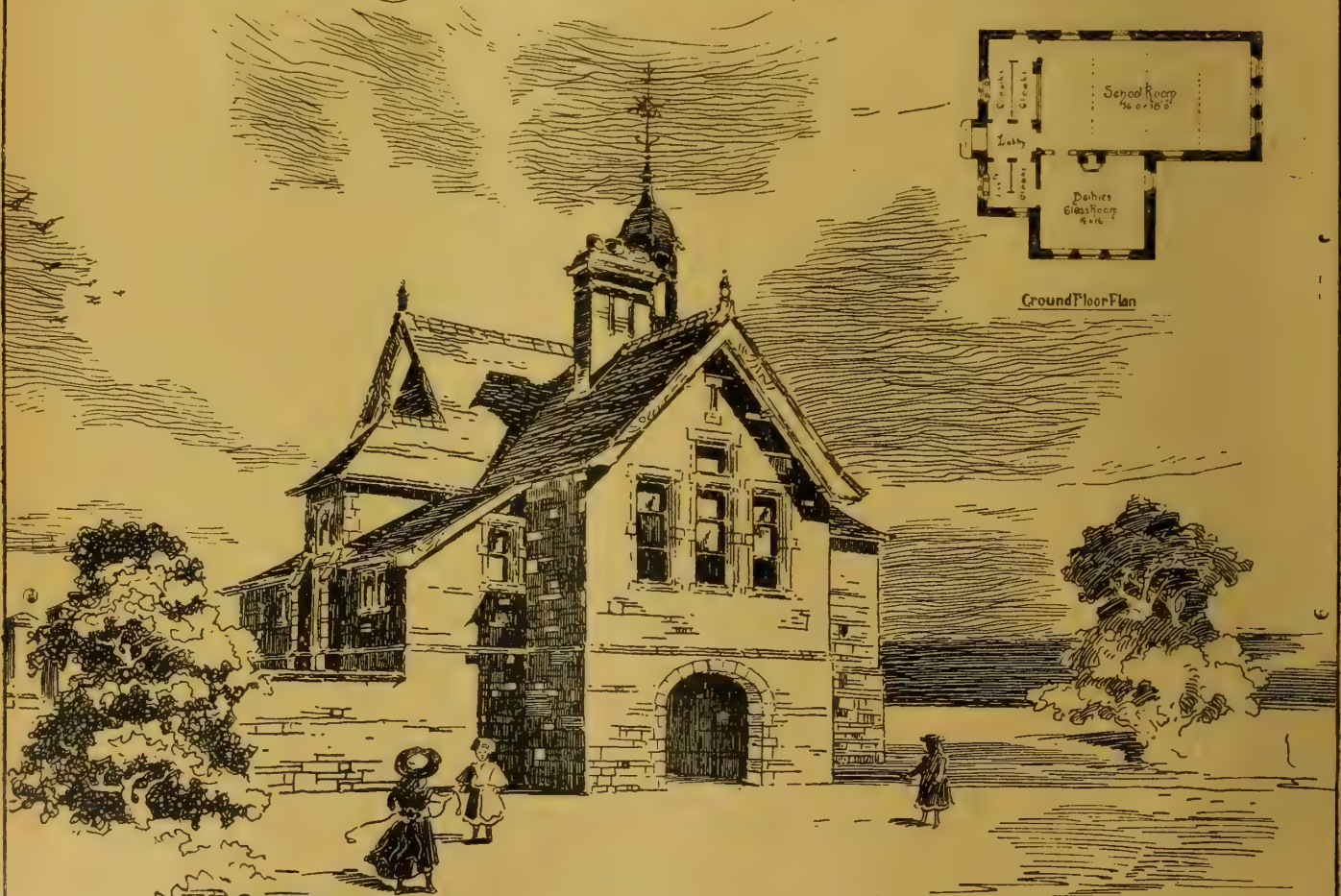
Endicott, Sec.

A. Smith & Co. Architects

## Infants' School at Ambler, Thorn.



Ground Floor Plan



South-West View.

J. F. Walsh  
Architect  
Halifax

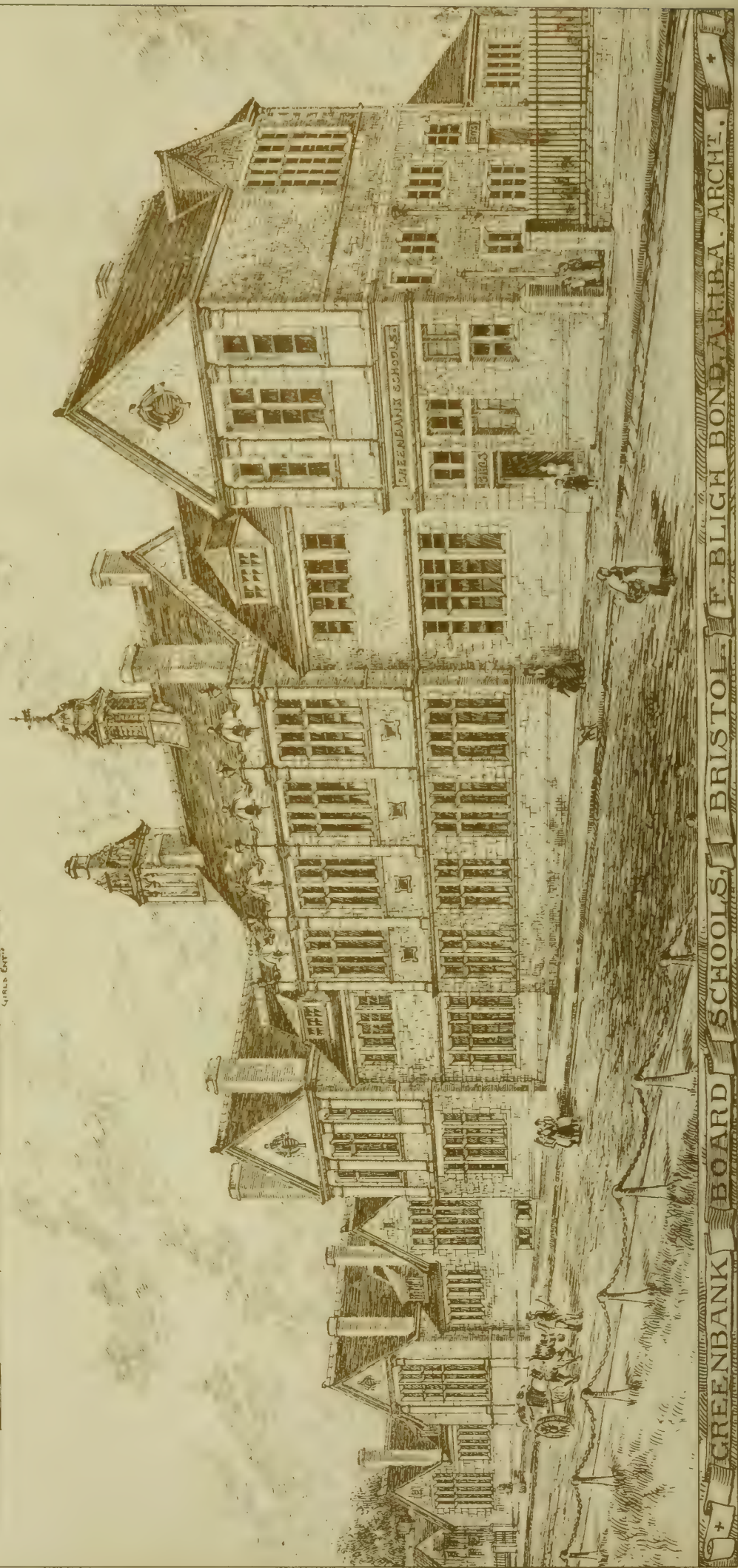
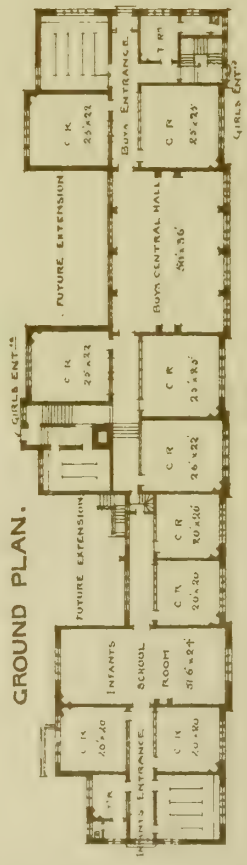






THE BUILDING DEWS, APRIL 3, 1896.

GROUND PLAN.



GREENBANK SCHOOLS, BRISTOL, F. BLIGH BOND ARCHT.









— PHOTO BY FRANZ HANFSTAENGL —





PHOTO-TINT, by James Akerman. 6, Queen Square London. W.C.



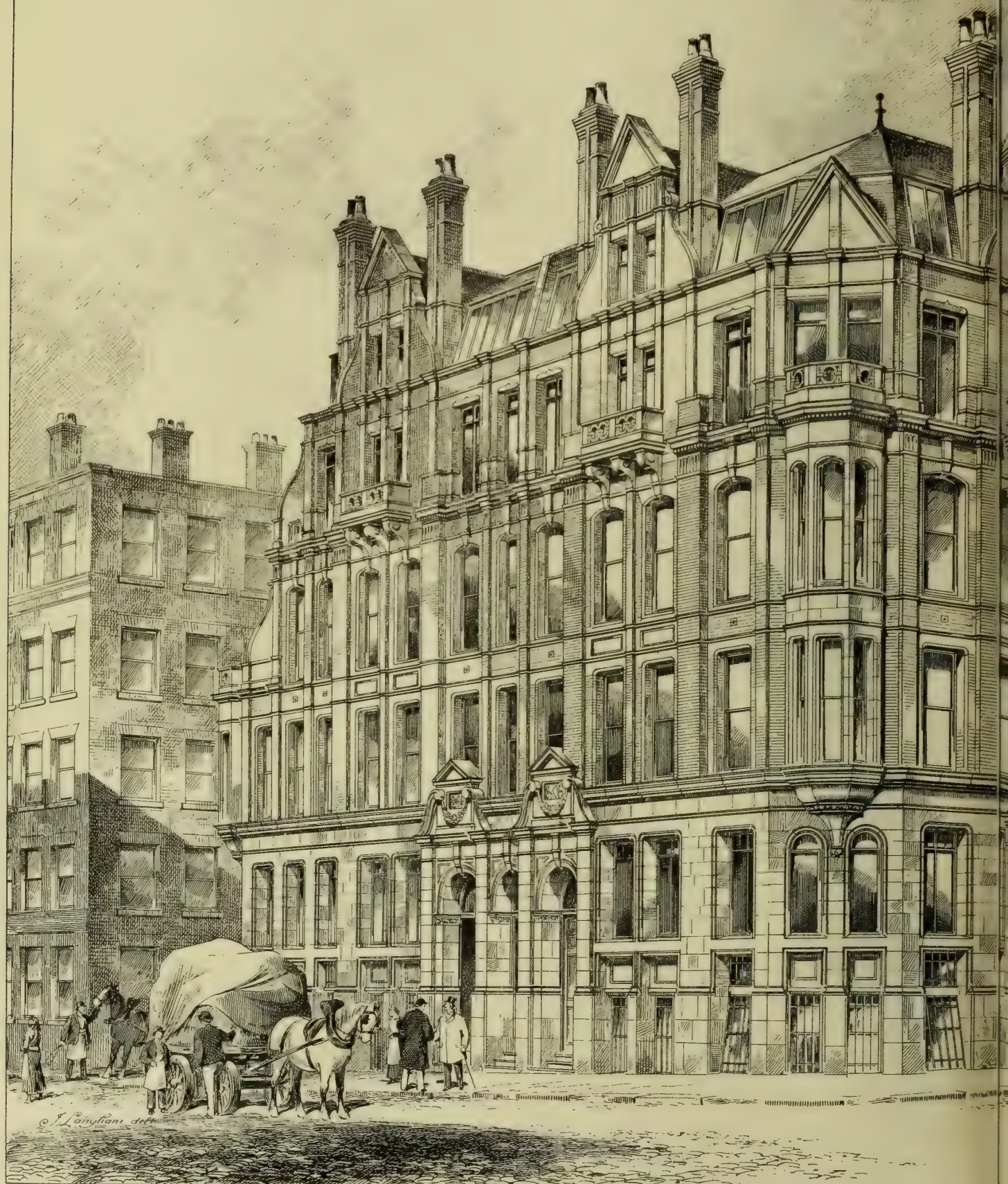




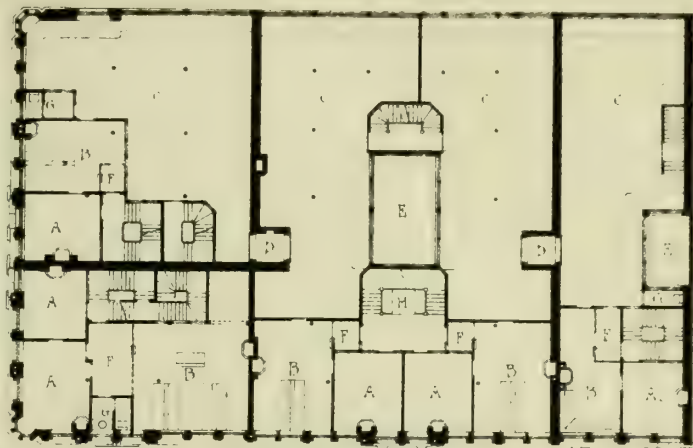
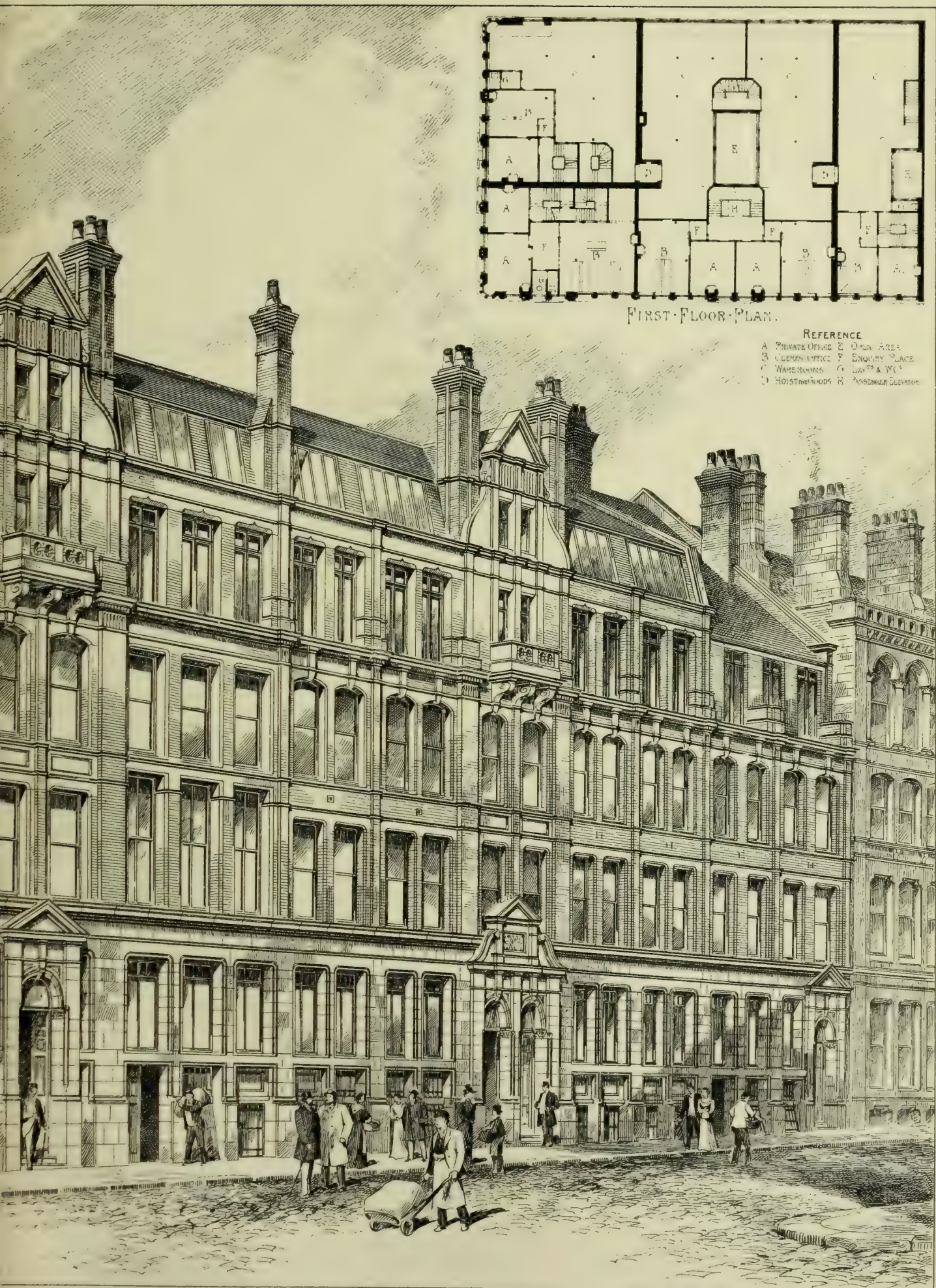




WAREHOUSES & OFFICES MANCHESTER I R E BIRKETT ARIBA ARCHT







FIRST-FLOOR-PLAN.

REFERENCE

- |                  |                      |
|------------------|----------------------|
| A PRIVATE OFFICE | E OPEN AREA          |
| B CLOSET OFFICE  | F ENQUIRY PLACE      |
| C WAREHOUSES     | G LAY & W.C.         |
| D HOISTWAYS      | H PASSENGER ELEVATOR |

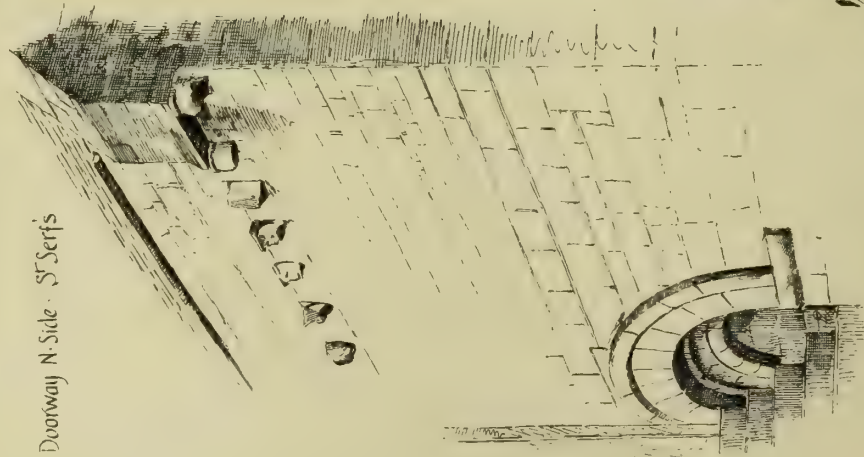




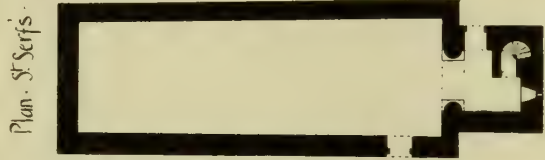




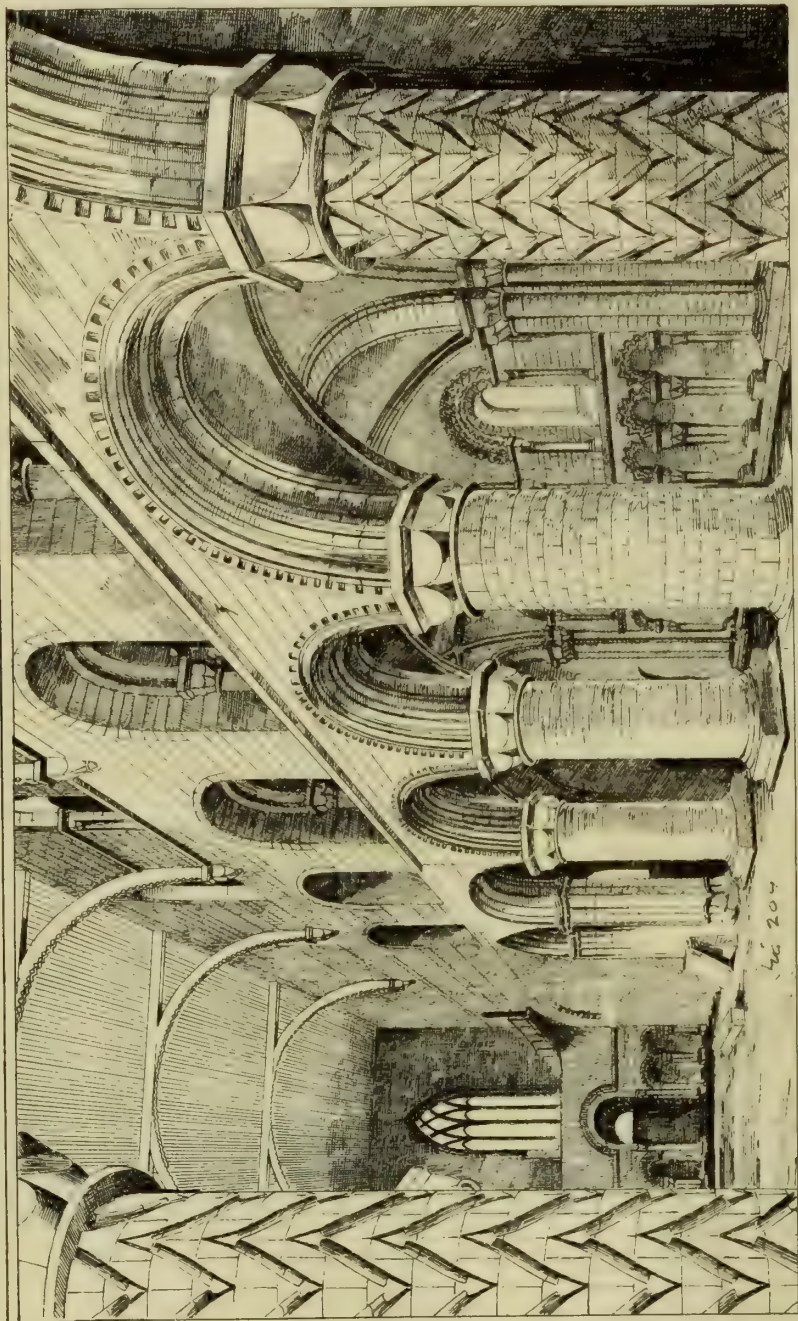




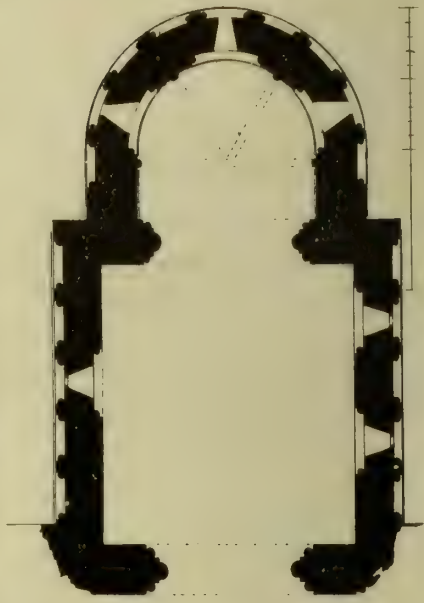
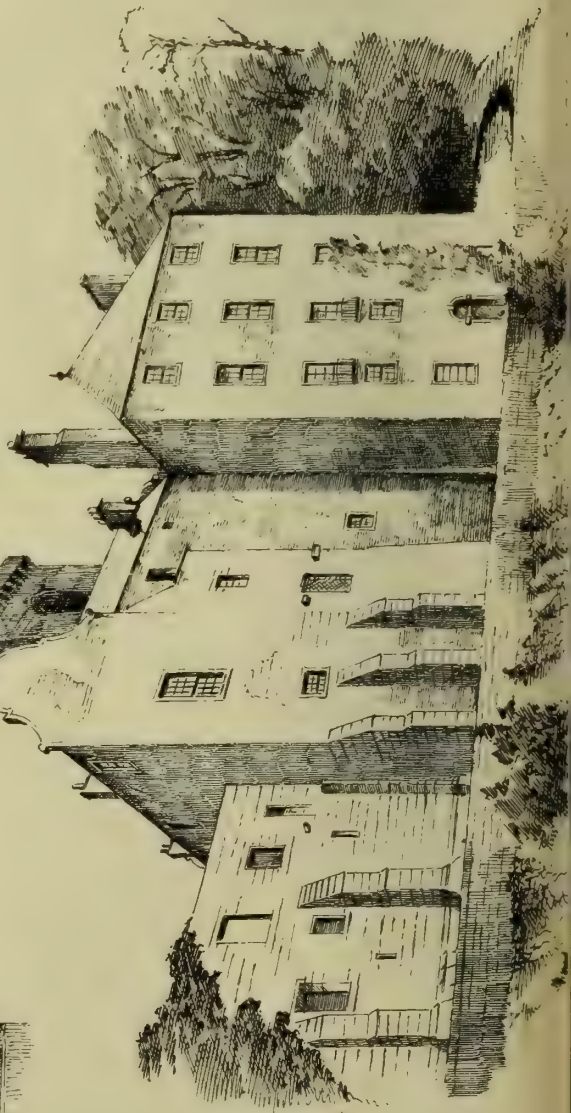
Doorway N. Side - St Serf's



Plan. St Serf's



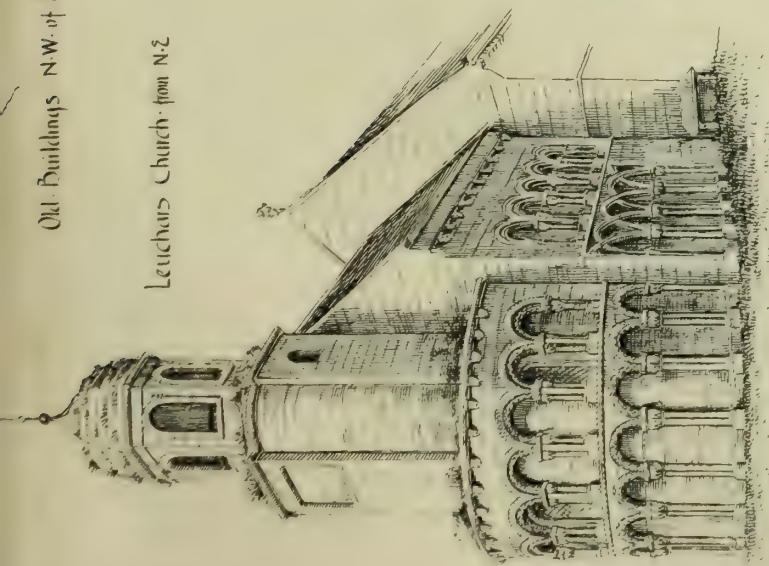
Dunfermline Abbey - View of Nave looking West



Plan of Leuchars Ch.

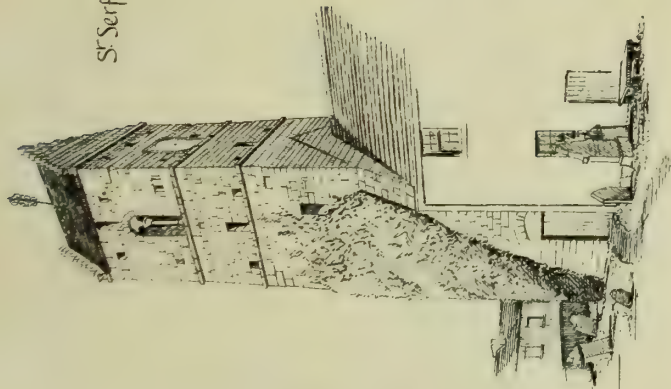


Old Buildings N.W. of Dunfermline Abbey.



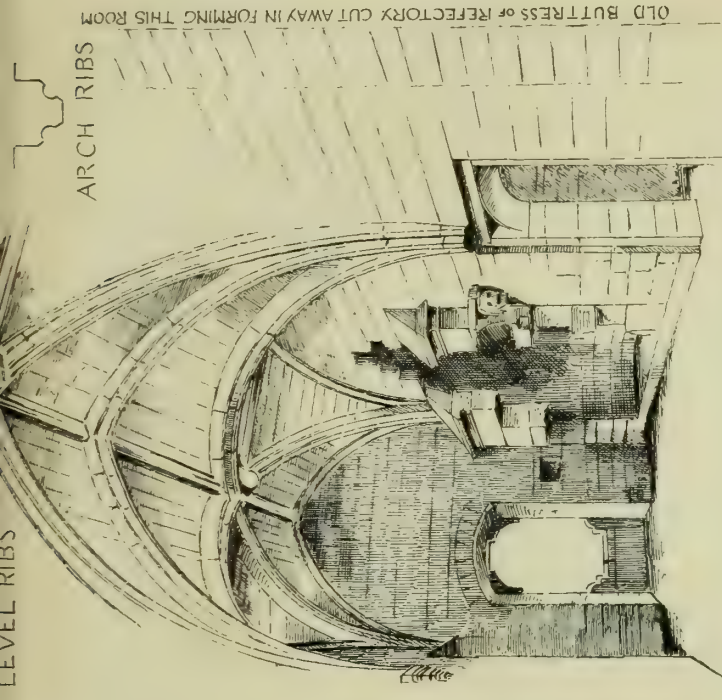
Leuchars Church from N.E.

St Serf's Dunfermline Perthshire.

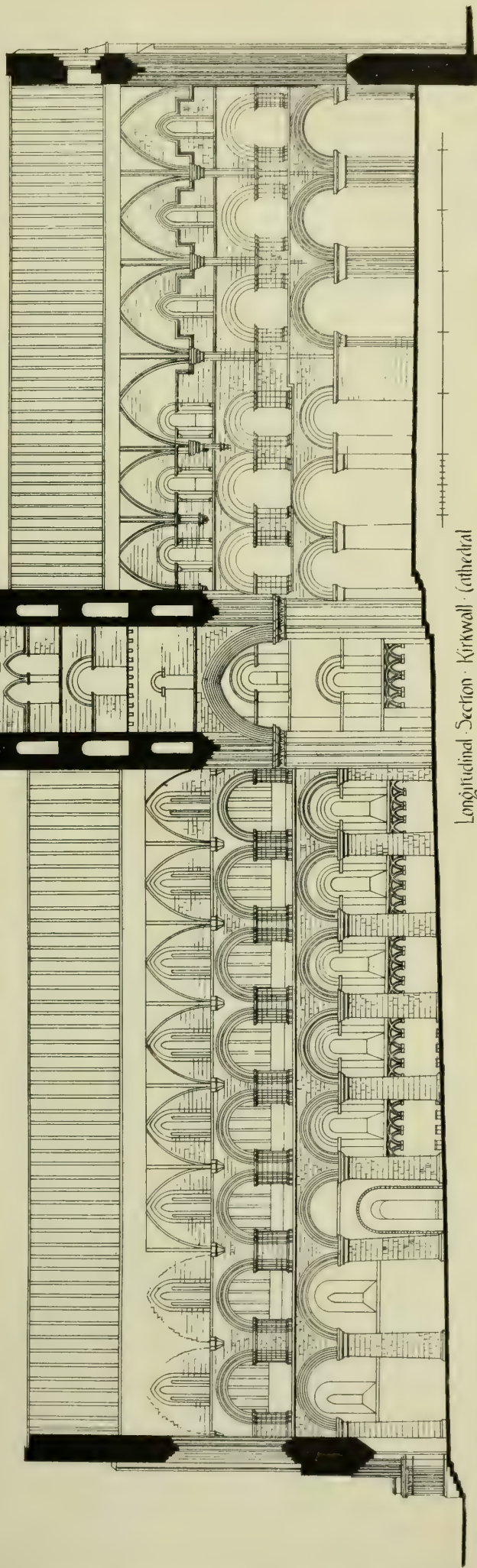


LEVEL RIBS

ARCH RIBS



Upper Run Fold Tower Refectory Dunfermline



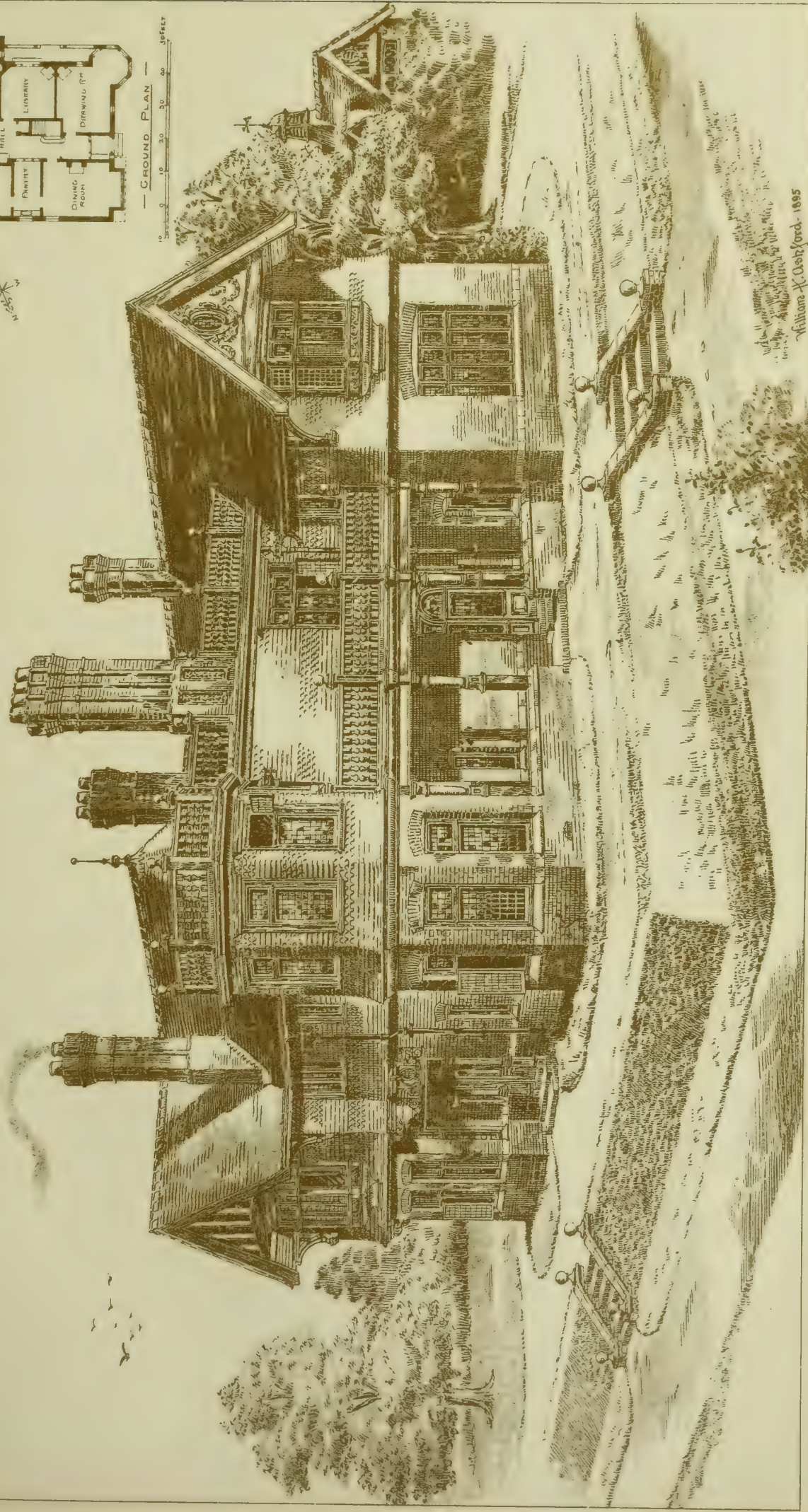
Longitudinal Section Kirkwall Cathedral







RESIDENCE AT CEFN COED - CARDIFF. EDWIN SEWARD, F.R.I.B.A. ARCHT.



William H. Ashford, 1895

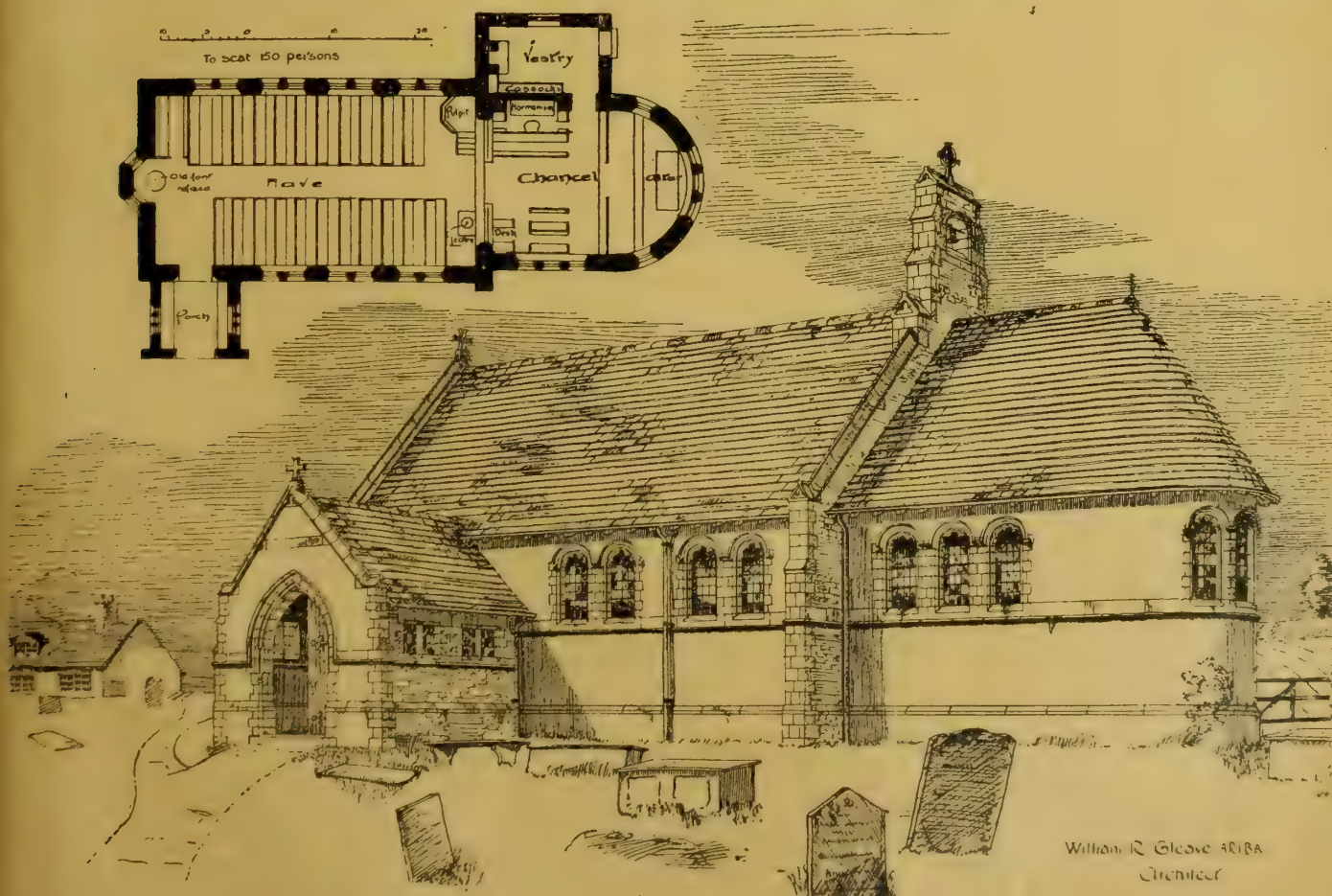








# St MARK'S CHURCH, STAINBURN WORKSHED.





## Building Intelligence.

**LEEDS GENERAL INFIRMARY.**—The old operating department of the Leeds General Infirmary having become somewhat antiquated, it is decided to reconstruct it. The new department, for which contracts have just been let, comprises the following accommodation:—A central hall or vestibule of ample size (an elongated octagon on plan), around which the various rooms are grouped, which comprise two operating theatres, each 23ft. 6in. by 19ft. 6in., with an instrument-room, 16ft. by 14ft. 2in., adjoining and opening out of each; two anaesthetic rooms, each 15ft. 10in. by 12ft., opening into the operating theatres; two waiting-rooms, 14ft. 3in. by 12ft., opening into the anaesthetic rooms; a surgeons' room, 10ft. 6in. by 9ft. 5in., and a recovery room of similar size. Provision is thus made for two complete sets of operating and accessory rooms, admitting of two cases of operations being proceeded with at the same time. Galleries of skeleton iron construction, with teak treads and seat rests, on either side of the theatres give accommodation for 56 students in each room respectively. The instrument-room, which adjoins and opens out of each of the operating theatres, is both roof and side lighted, with terrazzo floor and opaline-lined walls. The department will be lighted throughout by electricity. The total cost of the new department, including fittings, will amount to about £4,000. The new department has been designed, and is being carried out under the superintendence of Mr. William H. Thorp, F.R.I.B.A., architect, of 61, Albion-street, Leeds.

**MIDDLETON, WEST RIDING.**—A new Wesleyan Methodist Chapel at Middleton, near Leeds, was formally opened on Friday. It is in the style of English Renaissance, is situated in Mount-pleasant, and occupies an elevated site. All the buildings are faced with red pressed bricks, relieved with moulded brickwork. Welsh slates are used as the covering for the main building, and red tiles for the tower. There is accommodation in the church for 365 persons, and in the vestry for 40. A minister's vestry and lavatory have been provided, as well as a caretaker's house. The following are the contractors: Mr. J. Pullan, Beeston Hill, brick, carpentry, and joiner's work; Mr. J. Season, Hunslet-road, slater's work; Mr. J. Lindley, School-close, plumber's and glazier's work. The architects are Messrs. Thomas Howdill and Charles B. Howdill, 24, Albion-street, Leeds. The total cost has been £2,000.

**WATFORD.**—The Isolation Hospital, which has recently been built at a cost of £11,600, was opened by the Countess of Essex on Tuesday week. The building consists of three blocks, and it is situate about a mile and a half from Watford, in the Lower Rickmansworth-road. The buildings are constructed of stock bricks, with red facings and gauged arches, and are inclosed by a brick wall, the entrance gates being nearest to the town, where the porter's lodge is situated. All the blocks, except that of administration, are one story in height. The latter is a three-story building situate on the left side of the entrance. The hospital proper comprises two blocks, each block consisting of a male ward for ten beds and a women's and children's ward for six beds. Between these wards are the entrance hall, linen store, nurses' duty room, pantry larder, and bath-room. At either end of the wards are sink rooms, closets, and lavatories, the floors of both wards being laid with oak blocks. The whole of the walls and ceilings are finished with granite plaster painted, and all the angles are hollowed. Hot water is laid on throughout from a high-pressure boiler. The isolation block consists of two sections, each section being exactly similar, but reversed. Each section comprises three wards, two of two beds each, and one for one bed. There is also a nurses' duty room between the double-bedded wards. There are two discharging blocks, which are situate in the grounds, quite detached. The laundry block, which comprises a washhouse and laundry, is situate at the north-west of the ground, and it is provided with steam boiler and disinfecter. In the rear of this block are the mortuary and inspection room, also a storage for coal, and an engineer's workshop. The drains are laid with stoneware pipes, with an inspection chamber at each end of the direction, and an intercepting chamber for each separate block, to a cesspool at the lowest point of the site, from

which the sewage is pumped by a gas engine to the urban council's sewage farm. The architect was Mr. C. P. Ayres, of Watford, the builders being Messrs. Andrews and Sons, of Watford. Mr. H. G. Rogers, of Liverpool-road, St. Alban's, was the clerk of the works.

### CHIPS.

The works in connection with the chapel to be erected at Llangefni, co. Anglesey, as a memorial to John Elias, the great Calvinistic Methodist preacher, were commenced on Monday. The approximate cost is £4,000. The architects are Messrs. O. M. Morris and Son, Portmadoc, and the contract has been let to Mr. R. J. Williams, builder, Bangor.

The city council of Leeds will consider, at their next meeting in April, a report and scheme drawn up by the city engineer, Mr. Thomas Hewson, for the reconstruction of Kirkgate Market, and the setting-back of the frontage to Vicar-lane. The estimated outlay is £68,000, and the Markets Committee, who have reported favourably on the project, ask for powers to invite competitive designs, and to offer premiums.

The foundation-stone for the Post-office for Dundee will be laid on May 27th. The building is to be erected from designs by Mr. W. W. Robertson, of H. M. Office of Works, Edinburgh, and Mr. J. B. Hay, of Dundee, is the contractor.

A new Congregational church, with schools and classrooms attached, is about to be built in Poulton-street, Kirkham, from plans by Messrs. Briggs and Wolstenholme, of Blackburn. The building will be faced with Yorkshire pierpoints, and will be seated for 450 persons on the amphitheatre plan. The outlay will be about £4,500.

The urban district council of Kidsgrave, Staffs, have appointed Mr. A. R. Wood, of Tunstall, as architect for the proposed new public offices.

Two new fire-brigade stations have just been completed for the London County Council—the one in Tabernacle-square, Shoreditch, and the other at the junction of Downham-road and Kingsland-road, Hackney. Both have been constructed from plans by Mr. T. Blashill, by the Works Department, the work being executed under the supervision of Mr. T. Holloway. The Shoreditch building has cost about £15,400, and that at Kingsland-road £13,700. The latter building accommodates one steam fire-engine, one combined hose-tender and fire-escape, one hose and ladder truck, one long ladder, one officer, 20 men (11 married and 8 single firemen and one coachman), and four horses. The Shoreditch building is rather larger.

It has been decided to build a group of municipal buildings and public halls at Govan, near Glasgow.

Extensive works of repair are in process at the pier at Tynemouth, which was damaged by a recent storm. Large concrete blocks are being laid off the end, under the direction of Mr. Messent, C.E., engineer to the Tyne Commissioners.

For the work of carrying out the building extensions at Chatham Asylum, a dozen tenders have been sent in to the Kent County Council. The highest is £59,869, and the lowest, that from Mr. Wise, £39,333—a difference of over £20,000.

The Tynwald Court of the Isle of Man is holding an inquiry into an application by the town council of Douglas for sanction to widen Prospect Hill at a net cost of £9,500.

Sir Thomas Wright, at Leicester, on Monday, laid the memorial stone of a Municipal Technical and Art School, which the corporation is now building at a cost of about £40,000. The building will have a frontage of about 215ft., and will be built of brick, relieved with white stone dressings, in the Renaissance style.

Two lych-gates, in memory of the late Vice-Chancellor Bacon, are about to be erected, from designs by Mr. Alfred Bickerdike, of 10, Culworth-street, Regent's Park.

The new board schools erected in Corporation-road, Darlington, to accommodate 450 children, were opened on Monday. The schools are built on a site of two acres of land to allow for future extension. Including the site, furnishing, &c., the cost will be about £6,550. Messrs. Clark and Moscrop, of Darlington, are the architects.

The celebrated collection of Welsh MSS., which was formed by the late Sir Thomas Phillipps, of Middle Hill, has been sold for £3,500 to the committee of the Cardiff Free Library. The collection consists of 1,461 items, the gem being the renowned "Book of Aneurin," one of the four ancient books of Wales, which is attributed by experts to the twelfth century.

About 30 members of the Edinburgh Architectural Association visited Inverkeithing on Saturday, under the leadership of Mr. Henry F. Kerr, A.R.I.B.A. After inspecting the various objects of historical interest in the burgh, the party walked to Rossyth Castle.

### COMPETITIONS.

**EDZELL, N.B.**—Mr. R. W. Inglis, of Reigate, recently invited competitive designs for a hall to be built at his native village of Edzell, near Brechin, as a memorial to the donor's father, the late Rev. Robert Inglis, the cost of the building not to exceed £2,500. In response, some 70 plans were sent in, and after examination by a London architect, who acted as assessor, the design submitted by Messrs. C. and L. Ower, of Dundee, was selected for execution, while the second premium of £7 7s. was awarded to Mr. J. Sim, of Montrose.

**LLANGOLLEN.**—Out of 110 competitors for the new Intermediate Schools at Llangollen, Mr. J. H. Feather, of Cardiff, has been placed first, and Mr. F. H. Shayler, of Welshpool and Oswestry, second.

### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**YORK ARCHITECTURAL SOCIETY.**—The fourth ordinary meeting of the members of this society was held in the Church Institute, Lendal, York, on Friday evening, Mr. Henry Perkin being in the chair, when a lecture on "The Mediaeval Manor House" was given by Mr. Francis W. Bedford, A.R.I.B.A., of Leeds. The lecturer traced the history of domestic architecture in its progressive stages. The address was illustrated with drawings and limelight views. The meeting closed with a vote of thanks to Mr. Bedford, on the proposition of Mr. Thos. Monkman, seconded by Mr. Geo. Benson.

The formal opening of the Snowdon Railway for passenger traffic is fixed for Monday.

Messrs. A. Macdonald and Co., Aberdeen Granite Works, are completing a granite fountain to be erected in the public park, Cockermouth, the birth-place of the poet, as a memorial of William and Dorothy Wordsworth. The fountain, which is about 7ft. in height, is surmounted by the bronze figure of a child. On the shaft of the memorial is cut the inscription:—"In memory of the childhood of William and Dorothy Wordsworth, born within sight of this fountain. W. W., April 7th, 1770; D. W., Christmas Day, 1771."

General G. P. Carey, an inspector from the Local Government Board, held an inquiry at Exmouth on Tuesday week respecting the application of the urban district council for powers to borrow £10,000 for drainage works and £1,000 for repairing foot-paths. Mr. Mansergh's scheme includes a new outfall sewer, it being stated that the present outfall was dilapidated, and did not effectually take the sewage from the beach. The estimate for the outfall sewer and tank was £5,060, and for reconstructing sewers in the town £3,700.

The plans of the new technical school for Paisley, which is to be erected in George-street, show a building three stories in height, with a frontage of 120ft. The style is a simple treatment of Italian Classic. The lecture hall will seat over 300 persons. Round this hall are grouped the various art rooms, and rooms for painting, drawing, shading, and elementary drawing. There is also on the first floor a second lecture hall to accommodate 200 students. The building will cost about £17,000. Mr. T. S. Abercrombie is the architect.

During the past week the new choir-stalls and other fittings at the parish church of Sevenoaks have been placed in position. Sir Arthur Blomfield was the architect, the seats being supplied by Mr. Thompson, of Peterborough. The additions consist of four choir-stalls richly carved, the two men's seats being made to hold 11 each, whilst the others will provide accommodation for 28 boys. The standards of the latter each have a figure of St. Nicholas carved upon them. In addition to these stalls there are two prayer-desks, a rector's and a curate's stall, carved *en suite*.

A new board school is being built in Heyworth-street, Everton, Liverpool, and will be ready for opening in the autumn. It is Nineteenth-Century Renaissance in style, and provides accommodation for 1,300 children, consisting of four main rooms, eleven classrooms, a cookery centre with offices, a gymnasium, &c. The rooms for the head master and mistresses are in the centre of the building, while the assistant teachers' rooms are so situated to overlook the playground. The classrooms are arranged on the sunny side of the structure. In the basement, excavated out of hard rock, are two workshops and a swimming-bath 32ft. by 18ft.—the largest school bath in Liverpool. The architect is Mr. William Rushworth, of Croydon, whose plans were selected in open competition. Mr. Isaac Dilworthy, of Wavertree, is the contractor, and Mr. Henry Hallard the clerk of works.



## ARCHITECTURAL EDUCATION IN LONDON.

**L**AST Friday evening an informal conference was held in the studios of the Architectural Association, which, although partaking somewhat of a private nature, was, at least, thoroughly representative, and the result of the meeting is no doubt likely to prove somewhat far-reaching in its character. The following is a copy of the notice convening the gathering, and, as the subject dealt with is so eminently associated with the best interests of all who are engaged in the building craft, we shall not be betraying any confidences, or be disclosing any secrets by thus referring to the matter; indeed, the promoters of the conference undoubtedly desire the widest possible support and publicity, not only in the profession at large (to use a cant phrase), but among all art workers and those interested in the development of architectural education:—

The Architectural Association,  
56, Great Marlborough-street, London, W.,  
March 13, 1896.

DEAR SIR,—We are desired by the President and Committee of the Architectural Association to request the honour of your presence at an informal conference with the Education Committee of the Architectural Association, to be held at 56, Great Marlborough-street, W., at 8 p.m., on Friday, the 27th March, with a view to discussing the present position of Architectural Education in London.

It is hoped that the following gentlemen, among others, will attend:—Mr. Maurice B. Adams, Mr. J. M. Brydon, Professor Banister Fletcher, Dr. Garnett, Mr. W. R. Lethaby, Mr. Mervyn Macartney, Mr. R. Norman Shaw, R.A., Professor F. M. Simpson, Professor T. Roger Smith, Mr. John Sparkes, Mr. R. Phené Spiers, Mr. Alfred Waterhouse, R.A., Mr. Aston Webb, Mr. Sidney Webb. Your kind reply will oblige—We are, dear Sir, yours faithfully—

(Signed,) BANISTER F. FLETCHER, Hon. Secs.  
ALFRED H. HART

The conveners of the meeting can but congratulate themselves on the attendance and the spirit of unreserved liberal-mindedness which marked the whole of the speeches of those who contributed to the discussion. The main question before the conference may be stated briefly as being comprised in an endeavour to found a broadly-based scheme by which a technical acquaintance with the several building trades' work may be acquired by the pupil or architect's apprentice concurrently with the period of his term of articles, and, further, to admit without limitation all students preparing for the callings of the builder, decorator, and art-worker, not forgetting the engineer. To concentrate and unite, at least, in some degree, the various schools and schemes actually at work in London at the present time, in order that some combined effort may be realised towards economy of working, and a more complete share of advantages secured for students and teachers throughout the Metropolis. At present much good work is undoubtedly being done, and although the architectural school of the Royal Academy is for various reasons by no means adequately marked by that degree of success which should distinguish the leading school of its kind in this country, only nine students seemingly being in attendance quite lately, and only two or three competitors contesting last December for the R.A. Gold Medal; other centres of activity, such as the Architectural Association and Royal Architectural Museum, are in some ways exceeding their past records in a very marked degree, the fees received from students, for example, at the Westminster institution during the past year exceeding that of the previous year by £300, and £200 more than any former year since the schools have been started. Still, much of the work is not quite so technical or conducted on the exact lines which should undoubtedly be the case; the advanced classes at the Architectural Association, too, are not so well attended as they should be; and at King's College, where Professor Banister Fletcher has done much to complete his collection of examples and perfect his scientific teaching, the day classes are not by any means fully attended. The Architectural Association, distinctly the leader in educational matters, through its present president, Mr. W. D. Caröe, supported as he is by a strong committee of practical men, is seeking to obtain the co-operation of the Royal Academy, the Art Workers' Guild, the Architectural Museum, and, if possible, of the Education Department of the London County Council, who, however, would indeed make a fatal mistake in the interest of true architectural advancement if a Metropolitan Municipal School of Architecture should be founded on hard-and-fast scientific lines, where mediocre merit would, no doubt, be insured, but where the loss of individuality and real artistic culture would inevitably result, as it has

resulted in the schools of France and Germany. The apprenticeship system, as Mr. T. G. Jackson, A.R.A., and Mr. J. M. Brydon pointed out at the above meeting, must embrace the most practical advantage to a student, particularly where the master takes his pupils individually on to his works and into the shops of the various artificers engaged in executing his designs. Beyond this, however, it is manifestly necessary that the student should have the advantage of class teaching, based upon a practical scheme, under the instruction of qualified architects, and, if possible, every architect student should learn some one of the handicraft trades. Nothing can insure practical knowledge, after all is said and done, like serving a term in the workshops of some good builders, either as a joiner or a mason, in order that the student may see actual work carried out, not as is done in technical schools merely, where the stuff is handed out as so much material for trial essays, but where every inch of wood or stone has to be properly accounted for and set out with economy and despatch. Possibly less scientific methods are in vogue in such shops than may obtain pre-eminence in polytechnics, but a knowledge of handling stuff of whatever kind in the same way as the regular trades must do for everyday uses is a very great consideration to be realised for practical purposes. Building, in fact, as Mr. W. R. Lethaby tersely remarked, should not be divorced from architecture, for even a cow-shed should be artistically and properly constructed. The great want in the present day is not so much to develop the erection of good individual works of architecture as singular and remarkable examples put up here and there, but to level up, if possible, at any rate, in some degree the ordinary everyday building, and this end can only be secured by educating all classes of workers more or less who are employed in the trade, be they workmen, master builders, decorators, sculptors, or architects, uniting them, as far as practicable, in a sort of art workers' guild. This opens up the question whether the mere professional architect should be absorbed and, if necessary, lost sight of in this catholic combination of workers, thus revived on the principle in vogue during the Middle Ages, when the architect and builder, instead of working with conflicting interests and being divorced as now, were actually united in one person. Already some few leading art architects are taking up building without employing either quantity surveyors or master builders, and who can tell to what extent such a scheme of building operations may be developed? At any rate, this is certain—that the proposals which the President of the Architectural Association, Mr. W. D. Caröe, shadowed forth in his opening address to the meeting on Friday, presents possibilities which all true lovers of their art must recognise as a goal well worthy of their united efforts; and it is a satisfaction to have the assurance of goodwill from such distinguished members of the Royal Academy as Messrs. Alfred Waterhouse, R.A., and Norman Shaw, R.A., while Mr. T. G. Jackson, A.R.A., promised the meeting that the council of that body would, he was confident, receive any memorial in the direction indicated, not only in a friendly spirit, but with every intention of material aid. Now that the matter has been thus taken in hand, we may hope that the scheme will before long assume a definite shape, and soon be put in working order.

## THE NATIONAL PORTRAIT GALLERY.

**T**HE opening of the New National Portrait Gallery, the new façade of which building directly faces Charing Cross-road, gives us the opportunity of supplementing our former notices of this important structure, which we illustrated in the BUILDING NEWS (July 10, 1891, Vol. LXI.) We may just refer to the fact that the initial step was taken as long ago as 1856, when the Government made a grant which was voted by Parliament. The cost of erecting the present building has been defrayed by Mr. W. H. Alexander, and the structure now completed and occupied by the noble collection of historical portraits was designed by the late Mr. Ewan Christian, who has displayed considerable skill in connecting it with the older building, and in completing the eastern façade of the National Gallery. The northern or main front of the new Portrait Gallery is on a higher level, and a bold and independent treatment of the

newer work was called for. Mr. Christian has ingeniously introduced the entrance-hall and staircase to break the junction between the old and new building, which staircase gives access to each floor of the galleries. The design of the new building is essentially Florentine in main features, which thus differs distinctly from the severe Classic feeling of Wilkins' work. This independent treatment was necessary to secure the amount of light required to the large circular-headed windows which form so important a feature in the north façade. Entering a spacious main hall on the east side paved with mosaic, we ascend the central flight of stairs, which is arranged with intermediate walls and arched ceilings on the Roman style. The ascent is easy. A cross gallery or landing runs at right angles to the staircase, from which the main corridors or suites of galleries lead, these being north and south in direction, with the main windows facing Charing Cross-road on the north, and the inclosed area between the buildings on the south side. Taking the first floor, which is repeated above, there are three rows of galleries or cabinets, 13 in all; the central row forms a wide corridor. These are all directly lighted by windows. These galleries vary in size from 58ft. by 17ft. to 16ft. by 15ft., the general width being 20ft. On the first floor there are 12 such galleries. These are devoted to several important periods of portraiture, beginning in the furthest room on the top floor with early portraits, the Tudor, Early Stuarts, Cromwell, Charles II. (Restoration), Charles II. and James II., William III., Anne, the Pretenders, &c., thus coming to the Georgian and Victorian eras. By the recent addition of a crudely-executed panel portrait of Edward IV. all the Sovereigns of England from Henry III. to Victoria are now represented, with two exceptions—Edward V. and William IV. The top floor is lighted by lanterns, and these galleries have coved ceilings, the wall "fillings" are of a subdued greyish-green paper, teak block flooring, and panelled doors and architraves of the same material. The mosaic corridors and vestibules have been executed by Messrs. Diespeker and Co. The ground floor is occupied by the administration department, a reading-room, judging room, secretary's room, trustees' room, opposite the latter being the room for pictures under inspection, with private staircase and separate entrance at the west end of block from a roadway from Castle-street for the conveyance of canvases. The eastern wing, which is attached to the old building on the left of entrance, is intended for sculpture. The basement of the north block has two stories, which will be utilised as library and curio galleries, cloak-room, heating chamber, and the lower to the cellars and offices. Messrs. Shillitoe and Son, of Bury St. Edmunds, were the contractors. The cost of the building has been about £96,000. We can only give a brief reference to a few of the portraits which have lately been acquired.

Under the direction of the successor to the late Sir George Scharf, Mr. Lionel Cust, the portraits have been arranged in chronological order as far as possible. Many of them show traces of a thorough renovation, and all the frames have been restored and regilded. The historical sequence is, however, a little complicated by an attempt to range the subjects in classes. They include statesmen from Sir Walter Raleigh, by Zucchero, to Bright, Beaconsfield, and Idlesleigh, respectively by Oulless, Millais, and Richmond; divines, including Richard Butler, Charles Wesley, Isaac Watts, Whitefield, Edward Irving, and the ill-fated Dr. Dodds; poets, among whom the Chandos half-length of Shakespeare is pre-eminent; many soldiers, and a few philanthropists, including Clarkson and Wilberforce; and Robert Pine's Garrick, Gainsborough's Colman, and other dramatists. Painters are well represented, and include, among the auto-portraits, Reynolds, Hogarth, Gainsborough, James Barry, William Hunt, and Wright of Derby. Among the few architects are Sir John Soane, whose rugged features in extreme age are well depicted by John Jackson; Sir William Chambers, a half-length by Reynolds, and a group in which Chambers is showing a plan of a portico to Reynolds and a sculptor. John Britton, the self-taught architectural draughtsman and topographer, is represented in a small panel by John Wood, and Sir Edwin Chadwick, the father of sanitation, also has a place in the collection. Erasmus and Charles Darwin, Joseph Hooker, and Richard Owen are representative biologists.



The most interesting and important series is a range of thirteen small bust canvasses executed and munificently presented by Mr. G. F. Watts, R.A., and vividly depicting some of the best known men who have recently passed away, Tennyson, Browning, and Rossetti; Carlyle, John Stuart Mill, and Matthew Arnold; Cardinal Newman, Lord Lawrence, Sir Andrew Clark, and Sir Henry Taylor. These hang in Room XXXI.; on the opposite side is the Franklin group of Arctic explorers, including Sir John and Lady Franklin, Parry, Ross, McClintock, Beechey, and Murchison. The collection includes several busts and a few statues, the total number of exhibits being about a thousand. Several of the descriptions to the canvases are scarcely accurate—e.g., Sir John Rennie hardly deserves the title of engineer "and architect," and Orator Hunt died before the title "Liberal" had a definite political meaning attached to it.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XX.

By JOSEPH HORNER.

**T**HE Forth Bridge, a structure on which the highest engineering skill and experience were concentrated, was painted with both lead and iron-oxide paints. First, however, every section of work previously to erection was scraped with steel scrapers and scratch brushes, and a coat of boiled oil was applied as hot as possible. As soon after erection as convenient, and in many cases previous thereto, the work received a coat of red lead paint, and subsequently a second similar coat. On completion, the coats of oxide-of-iron paint were applied over the lead on all the outside portions of the bridge. Iron-oxide paint was not applied to the interior portions of the tubes. Those received one coat of red and two coats of white-lead paint. The amount of surface which had to be thus covered was equal to about 145 acres in extent.

The cast-iron pipes employed for water and gas are usually coated with tar by the method known as Dr. "Angus Smith's." The ingredients comprise one part of coal-tar to three parts of pitch oil. This is raised to the boiling temperature of the oil, about 350° to 450° Fahr., the pipes are immersed in it, and allowed to remain until they attain the same temperature as the mixture. They are then withdrawn, and as the volatile matters evaporate, a hard coating of pitch remains. The castings must be free from sand and rust, and the tar purified. The same method is adapted for iron work exposed to the action of salt water, as well as fresh. Corrosion in water and gas-pipes is delayed by packing them round tightly with earth, if the earth is not damp. Plumbago is sometimes mixed with hot coal-tar for the protection of ironwork; or asphaltum is mixed with oil of turpentine and mineral black, the latter being added after boiling the tar. Jay's metallic paint is composed of resin dissolved in turpentine to the consistency of treacle, to which colouring matters are added at discretion. Cast iron immersed in sea-water without suitable protection becomes subject to destructive corrosion of a peculiar character, due to the uncombined manner in which the carbon is present in the iron. Trautwine instances the case of cast-iron cannon, recovered from the wreck of the *Royal George* after immersion in the sea for 62 years, and from the *Edgar*, after immersion for 133 years. In each case the cast iron had generally become quite soft, and in some cases resembled plumbago. Some of the shot also, when exposed to the air, became hot, and burst into many pieces. He further cites the case of certain unprotected parts of cast-iron sluice-valves on the sea-gates of the Caledonian Canal, which were converted into a soft, plumbaginous substance to a depth of  $\frac{3}{4}$  in. within four years; but where they had been coated with common Swedish tar they were entirely uninjured. Similar destructive corrosion occurred in the case of cast-iron pipes imbedded in earth rendered moist by the percolation of sea-water.

Iron, like wood, is especially liable to rapid destruction when alternately wet and dry. For piles or columns so situated, coal-tar is the best preservative. Tar is not of much value for the protection of ironwork above ground, exposed to the heat of summer suns. It melts, and in time peels off. Galvanic action attacks iron seriously when in contact with other metals in a wet or damp situation. Thus it will become corroded if

in direct contact with copper, brass, or gun-metal. On the other hand, zinc acts as a protection to iron, being itself eaten away. Hence its employment for roof sheeting, and by the engineer inside steam boilers. If iron is imbedded in mortar so completely as to exclude air and moisture, absolute protection is afforded against corrosion. Cement is also a preservative. But the difference in the coefficients of expansion of the metal and the cement tend to the production of cracks in the latter.

The discovery of Professor Barff in 1877 differed in principle absolutely from the application of paints, which depend for their virtue on mechanical adhesion, and not on chemical affinity. The film of magnetic oxide formed depends for its adhesion on the force of chemical affinity. It is also harder than the iron itself. Being a stable oxide, it does not become a carrier of oxygen to the metal beneath, as the instable ferric oxide does. This last and the ferrous oxide are of a spongy character, and offer no barrier to the spread of rust beneath them. The magnetic oxide protects the surfaces beneath it from corrosion, even though portions adjacent should be exposed and rusting. The articles to be treated are placed in a muffle, heated to a temperature of from 500° to 1,000°, or 1,200° Fahr., and subjected to the action of superheated steam during from five to twenty hours. In Bower's process, the action of air and of carbonic acid was utilised to produce similar results. In both methods, the processes are largely under control, so that any required film of oxide can be produced. The colour is a dull bluish-black. Great things were expected of the processes. As the *Times* remarked, "it will indeed render all kinds of iron-work, however much exposed to weather or to corrosive vapours or liquids, practically indestructible and everlasting." "Among the most valuable and important of the probable applications of the invention will be the protection of the steam-boilers and of the plates of iron ships." "It will extend the application of iron itself to several purposes for which its liability to rust has hitherto rendered it unsuitable. Copper vessels will no longer possess any advantage for cooking, and iron saucepans will no longer need to be tinned. Lead pipes for the conveyance of water will in all probability be entirely superseded." This was in 1877; but none of these expectations have been realised. The processes were costly where large pieces of work were concerned—chiefly on account of the quantity of fuel used for superheating the steam. For large outdoor structural work it was prohibitory also, because of the dimensions of the plant required. In some work, the distortion produced by heating was objectionable; in others, the reduction in strength. For riveted work it was unsuitable. If riveting was done first, the hold of the rivet was weakened; if done afterwards, the rivet was not protected from oxidation. To hardened and tempered work it could not be applied. Work is increased in dimensions by the process, so that where exact fitting is necessary, allowance has to be made for increase in size, or else subsequent adjustments become necessary, by which the coating is removed. In short, the exceptions to its useful applications were so numerous that the methods, though perfect from the point of view of the chemist, proved unsuitable to the exigencies of practical conditions.

Gesner's rust-proof process, for which there are several plants in operation in the United States, resembles in some points the Bower-Barff. But it differs therefrom, both in the chemical composition of the coating and in its physical characteristics. It is not the magnetic oxide, but a compound of hydrogen, carbon, and iron, the colour being a deep blue-black. It is claimed that the coating does not increase the dimensions of the articles so coated, as the Bower-Barff does; that it does not chip off, and that articles can be bent to an angle of 45° without injury to the coating. It is also said to be cheaper than either tinning or galvanising, and to be suitably adapted for large pieces of work—such as water-pipes and fittings, builders' hardware, gates, and architectural work generally. The articles to be treated are heated in clay retorts to 1,000° or 1,200° Fahr. Steam is admitted into the retort, and being decomposed, hydrogen is set free, filling the retorts. After a while, naphtha is injected for a few minutes, and then cut off, the steam being allowed to enter a few minutes longer. When the process is complete, and the steam shut off, the articles are allowed to remain until the retorts have cooled down to

about 800° Fahr., when they are withdrawn. Ornamental objects are afterwards given a bath in whale or paraffin oil.

Enamelling is resorted to in some of the smaller articles in cast iron, as in the household utensils of sheet-iron now so common. The process is simple, but some secrecy is observed in reference to the ingredients and proportions of the enamel mixture, which varies in different works. Enamel is a vitrified glaze, which is fused to the surface of the metal which it is desired to protect. It is composed of powdered silicates and borates of easily fused salts, as those of sodium, potassium, and lead. Metallic oxides are added to impart such colours as may be desired. The enamel is usually applied in solution in water, or gum-water, with a brush, over the surfaces which require protection. It is then raised to a high temperature in a muffle or an oven until the enamel becomes fused to the surface. The temperature will vary according to the character of the work. Enamelling has been, and is still, employed to a certain extent in the protection of articles in cast iron. But its applications are very limited. It is not cheap, nor adapted for massive work, nor safe for intricate castings, which would be liable to distortion and fracture.

The covering of iron with tin or with a mixture of tin and lead (terne plates), though of immense commercial and economical importance, is not a process adapted for the protection of cast iron. Neither is japanning to any important extent; small articles alone in ironmonger's hardware, and those chiefly in malleable cast iron, being treated by japanning. The process termed galvanising is applied, not only to roof sheeting, but also to many castings exposed to weather. All that is necessary is to send the castings clean as they leave the sand to the galvanising works, where they are immersed in the bath of melted zinc similarly to sheet-metal goods. If holes have to be drilled, or any parts turned or faced, these must be done afterwards.

One fact alone renders the various rust-proof processes of very limited value in most structural cast-iron work—none of them, whether they are due to coatings of magnetic oxide or processes akin thereto, enamel, solutions of tar applied to hot metal, can, apart from the question of cost, compete with paints. The reason, of course, is that nine-tenths of structural ironwork must of necessity receive its protective coating after erection. Very little, except oiling or the application of one coat of paint, is practicable previous to erection, and often much of this becomes abraded or chipped off before the completion of the work. It is for this reason mainly that nearly all structural ironwork is of necessity painted, and painted too after completion. Pipes coated with solutions of tar are an exception; but then they go underground at once. Many patented solutions have been proposed at various times, and great results promised from their use. But for nine-tenths of the structural ironwork to-day paint remains the sheet-anchor of the engineer and founder. Given a pure paint, there is nothing superior in point of protection from rust, as there is nothing so conveniently and cheaply applied. The problem, therefore, is practically one of purity and of price. The material of the old Hammersmith Bridge, bought by Sir William Arrol for temporary work on the Forth Bridge, was found as good as new after 62 years, notwithstanding that many portions had not been repainted during that period. The paint used was white-lead.

A course of twelve lectures on "English Architecture," given at St. Alban's under the auspices of the University Extension Movement, by Mr. Arnold Mitchell, F.R.I.B.A., was brought to a conclusion at St. Peter's Parish Room in that city on Wednesday week, the subject of the closing address being vaulted roofs.

Mr. Havell, Superintendent of the Madras School of Art, has been appointed by the Secretary of State for India to the post of Superintendent of the Calcutta School of Art in succession to the late Mr. W. H. Jobbins.

Mr. Langton Coke, C.E., one of the inspectors of the Local Government Board, held an inquiry at Crewe on Wednesday week as to an application by the corporation to borrow £2,000 for the purpose of sewerage a portion of Hungerford-road, £900 for a new steam plough, and £375 for altering the man-holes. The town-clerk (Mr. F. Cooke), the surveyor (Mr. G. Eaton-Shore), the medical officer (Dr. Jones), and the farm manager (Mr. Wodehouse) laid before the inspector evidence of the need of the various works.



## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

PROVINCIAL. (Better apply to the Secretary, 9, Conduit-street. We know nothing as to regulations.)

RECEIVED.—R. S. Peters.—Reg. Plumb.—J. W. F.—E. J.—C. T. and Co.—W. M. Surbiton.—Otto.

## Correspondence.

## A CORRECTION.

To the Editor of the BUILDING NEWS.

SIR,—In the report of the opening of Whitfield church, which appeared in your paper some few weeks back, our firm was given as *Norter and Sale*, and in consequence of this we have been inundated with advertisements thus addressed. May we ask you, therefore, to kindly call attention to the compositor's error, and give our correct designation and oblige?

We should have at once written you for this correction to be made had we realised the number of firms who would write us in consequence of your report.—We are, &c.,

NAYLOR AND SALE, Architects and Surveyors.  
Irongate, Derby, March 30.

The tender of Mr. John Allen, of Radcliffe, of £1,594 5s., has been accepted for the extension to Messrs. A. and J. Hoyle's works at Radcliffe, near Manchester.

A new Grand Theatre and Opera-House has just been erected by Messrs. Batley and Linfoot in the High-street, Croydon, and will be opened on Monday. The building, with some property in the rear and the freehold, has cost nearly £45,000. It is situated near the new municipal buildings, which are to be opened by the Prince of Wales in May next. The designs of the theatre were executed by Mr. Brough, from the ideas of the proprietors and Mr. Craven, the style being French Renaissance. There is seating accommodation for 2,000 persons. The stage measures 50ft. by 55ft., and from the floor to the grid is 102ft. There is an iron and asbestos curtain, weighing 6½ tons, a tableau curtain, and an act-drop, painted by Mr. Ryder Noble. There is a double installation of the electric light. The upholstery, which has been carried out by a Brighton firm, is in peacock-blue and old gold.

## Intercommunication.

## QUESTIONS.

[11494].—**Felling Timber by Electricity.**—Can any correspondent put me on the track of full information on "felling timber by electricity," using platinum wire and a powerful battery? I think I saw a description of this matter in the *Times* some time ago, but I cannot now trace it.—A. G.

## REPLIES.

[11493].—**Tank**—I infer tank is built on the ground, not in, from thickness of walls. Leakage is not caused through any expansion of masonry by pressure, but through the pores. Probably the greatest leakage is at the bottom. Thickness of masonry, although cemented, is no guarantee of water-tightness, because the water would find its way through the pores of new masonry if it were double the thickness. New work leaks most readily; but in course of time the pores will naturally get filled up. The cement rendering is probably only floated, whereas it should have been trowelled to a smooth surface to close the pores. Inside of tank should also have been cased with bitumen sheeting, and cased with 4½in. brick-work in cement for protection.—H. PRESTON.

## CHIPS.

Messrs. Beaumont and Son, of Lincoln's Inn-fields, write on behalf of their clients, Messrs. Balaam Brothers, of Shenton-street, Old Kent-road, to state that the statements in the report published on Saturday under the heading "Collapse of Scaffolding at Walworth" are absolutely untrue, and that there has been no accident of any sort or kind in the course of the erection of the buildings referred to. The report in question appeared in an evening contemporary.

Sir Augustus Wollaston Franks has been retired for age from the British Museum after 45 years' service. Since 1866 he has been keeper of the British and Mediaeval antiquities.

At Greenwich Police-court on Friday, George Moore, bricklayer, was committed for trial on charges of perjury, falsification of accounts, and embezzlement while acting as secretary of the Deptford branch of the Operative Bricklayers' Society. Bail was allowed.

The Edinburgh City Council have instructed Mr. T. Morham, the city superintendent of works, to prepare plans for a fire brigade station to be built at the Lauriston-place entrance to the Cattle Market.

Towards the building fund of the University College for South Wales and Monmouthshire over £16,000 has been subscribed.

A large block of buildings is being built for the Glasgow Y.M.C.A., with a frontage to Rothwell-street, and return ends to West Campbell and Main streets. The building will include a Christian and a Bible Training Institute, and is being built from plans by Mr. Robert A. Bryden, F.R.I.B.A., of the firm of Messrs. Clarke and Bell, 212, St. Vincent-street, Glasgow.

A movement is on foot, promoted by the Worcestershire Architectural and Archeological Association, for making a photographic survey of the county, similar to the very successful one which has been carried out during the past few years in the adjoining county of Warwickshire. Alderman Ernest Day, M.S.A., who is taking an active interest in the proposal, has suggested that the photographs shall be stored and displayed in the new Victoria Institute at Worcester, built from Messrs. Aston Webb and Ingress Bell's designs.

A new literary institute has been built at Wylam-on-Tyne from designs by Mr. William Bellington, of Eldon-square, Newcastle. It is Domestic Gothic in style, and is faced with Heddon stone. Messrs. J. and G. M. Hunter, Heddon, were the contractors for the mason's work, and the other tradesmen engaged in the erection were:—Mr. Adam Pigg, Wylam, joiners' work; Mr. Chapman, Corbridge, plastering; Mr. Chas. Nicholson, Newcastle, slating; Messrs. Johnson and Co., Newcastle, plumbing; and Mr. Rutter, Ryton, painting and glazing.

In our report a fortnight ago, p. 417, of the visit of the Polytechnic Building Class students to Messrs. Pawson and Leafs' new premises in St. Paul's Churchyard, we should have stated that the constructors of the concrete staircase were Messrs. W. B. Wilkinson and Co., Ltd., of Newcastle-on-Tyne and Westminster. This staircase is unique for the small quantity of steel and iron used in connection with its construction. It is carried by means of steel and iron of small section in tension in the lower part of concrete below the neutral axis, and it is an example of how simple it is to construct *in situ* flights of stairs carried across wide openings without being compelled to provide numbers of cranked strings, trimmers, girders, cleats, necessary in stone staircases, which involve so much labour, not only in the construction of the staircase, but in adjusting extras, which the excessive use of steel or ironwork generally involves.

## Legal.

## NUISANCE BY NOISE.

THE value of a house and garden in the country is evidently very much dependent upon the sights and sounds of the locality. Especially in regard to noises are we affected by our neighbours' actions, and sometimes by their amusements. Each case of the kind must really be decided upon its own facts, and the Courts are constantly having to draw a line somewhere between the justifiable noise that may be made by an adjacent occupier and the noise that amounts to a serious nuisance affecting the enjoyment of residential property, and, therefore, likely to depreciate both its letting and its selling value. The latest case upon the general subject is that of "*Sprugan v. Dossett*" (*Times*, 4th March), which was an action by the plaintiffs, who were three residents in the village of Theydon Bois, near Epping Forest, in Essex, for an injunction to restrain the defendant from using a steam organ in such a way as to be a nuisance to his neighbours. It appears that the defendant had opened a place in the village, which he pleasantly termed a "Forest Retreat," for the refreshment and amusement of visitors to Epping Forest and the like. It certainly seemed to be proved that the steam organ was one of great power and volume and fine penetration, and it may be taken as pretty clear that during the excursion and holiday season it played with vigour and vivacity during the greater part of the day. A point strongly made by the plaintiffs was that it rendered the enjoyment of a garden and tennis court quite impossible.

Of course, there was the usual conflict of testimony. But Mr. Justice Stirling decided upon the evidence that the noise was a serious nuisance, especially so to an invalid wife of one of the plaintiffs, who was also entitled to be considered. The learned Judge held that the fact of the noise making the use of a garden practically unenjoyable, if not hopeless, was to be taken into account, and that this question of a nuisance was not confined to the house itself, as had been argued on behalf of the defendant. It was hardly fair to say that if a man stayed indoors and kept all his windows shut the noise would not be so bad, for this was hardly having a reasonable use of his own property. Finally, the Court granted an injunction to restrain the defendant from playing this steam organ in such a way as to be a nuisance to the plaintiffs, and with costs. FRED WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

W. J. J.—AGREEMENT.—REPAIRS.—I do not consider that the clause you quote would make you liable to do any outside painting.

INTERESTED.—TRAFFIC.—"EXTRAORDINARY."—The ordinary traffic, caused by the staple industry of the place, would not, in my opinion, become "extraordinary traffic," however heavy it might be, with increasing trade.

The painters of Heywood have sent in an application to their employers asking them to concede an advance of wages of a halfpenny per hour. At present the men are paid 7½d. per hour.

New choir-stalls and a prayer-desk have been placed in the parish church of Bury, Lancs, as a memorial of the late Canon Hopwood. They have been executed by Messrs. Hatch, of Lancaster, under the supervision and from the designs of Messrs. Paley, Austin, and Paley, of the same town. The cost has been £620.

The first stone of a chapel for Wycliffe Hall, Banbury-road, Oxford, was laid on March 26th by the Regius Professor of Divinity, Dr. Ince. The chapel is in course of erection on a vacant plot of ground between the hall and Wycliffe Lodge, the residence of the principal, and will be a brick building with Taynton stone dressings; the inside measurements are 40ft. by 20ft.; the roof will be of oak, and covered with green Westmoreland slates; there will be a five-light traceried cusp-headed window at the east end, and a similar one of three lights on the south side, while at the south-west corner there will be an octagonal turret, containing one bell, surmounted by a cupola. A corridor will connect the hall with the ante-chapel, and a similar connection will extend to the principal's house. The chapel will accommodate fifty students. The architect is Mr. Wallace, of 37a, Old Bond-street, London.



## LEGAL INTELLIGENCE.

**BUILDING LINE APPEAL.**—LONDON COUNTY COUNCIL v. PRYOR.—At North London Police-Court on Friday Mr. Lane Q.C., attended to reverse a decision he had given in the case "The London County Council v. Pryor." (See reports in our issues of Feb. 14, p. 260, and March 13, p. 402.) The defendant, who had built houses on an estate facing the Court in the Stoke Newington-road, started the erection of a house which the Council contended was beyond the building line, and for which they had not given their sanction in writing as provided by 25 and 26 Vic. cap. 102, sec. 75, and 45 Vic. cap. 14, sec. 10, and 51 and 52 Vic. cap. 41. When the London County Council prosecuted Mr. Pryor for this infringement, Mr. Lane held that the defendant was within his rights, and dismissed the summons. But the Council appealed, and the order was sent back by the Master of the Rolls and Lords Justices Lopes and Davey to the magistrate to reverse his decision. Since the magistrate's decision, the building in question had been completed, and extended 7ft. beyond the line of frontage. The effect of this order was that the encroaching 7ft. be demolished, and that the owner pay the costs of the appeal. The owner of the property is Mr. Frampton, of Bournemouth, and he, it was stated, had intimated his intention of approaching the London County Council, with a view, if possible, of getting some concession. Mr. Thomas A. D. Chivers, who represented the County Council, asked for the order of demolition, and Mr. Lane replied that it must be made. He said that the oft-quoted Lord Auckland case with the Westminster District Board did not apply to new streets at all. Mr. Edell, who appeared for Mr. Pryor (the builder), said the order should be against the owner of the property, and not against the builder. Mr. Chivers said they might take proceedings against the owner if the building was completed; but in this case, when it was originally before the Court, the building had only just been commenced. Mr. Lane said the order would be made against Mr. Pryor to demolish; but if he failed to do so, the London County Council might do the work. Mr. Chivers asked that a time might be stated in which the work should be done. Mr. Lane: Three months. He added, Mr. Pryor ran no risk if he did not obey the order, because there were no penalties stated. But the London County Council could demolish the place, and the onus was upon the party demolishing as to the correctness of the operation. Mr. Adolphus Dovaston, one of the surveyors of the London County Council, produced plans showing the condition of the building when the magistrate's decision was given, and its present state. Mr. H. J. Thurgood, surveyor to Mr. Frampton, the owner of the property, said his client knew little or nothing of the case; but he would be communicated with. Mr. Chivers said the Council would not commence the demolition until the owner had been seen. Mr. Lane then made the order against Mr. Pryor for the demolition within three months, with costs.

**THE NEW SOMERSET COUNTY ASYLUM AND THE LATE CONTRACTOR.**—A meeting has been held of the creditors of Henry Phillips, builder and contractor, of Exeter and Taunton, and late contractor for the erection of the Somerset and Bath Joint Asylum at Cotford. The committee of inspection reported that, counsel having expressed the opinion that a good cause of action existed against the Somerset and Bath Joint Asylum Committee for damages for breach of contract, they recommended the creditors, together with Messrs. Sanders and Co., to take such action. It was ultimately resolved to authorise the trustee to forthwith take legal proceedings to enforce such claim; and that the creditors of the bankrupt do *pari passu* indemnify him against all claim for costs.

**RIPIARIAN OWNERSHIP.**—HINDSON v. ASHBY.—In the Court of Appeal, on Tuesday, judgment was given by Lords Justices Lindley, Kay, and A. L. Smith, in an appeal, Hindson v. Ashby, from a decision of Mr. Justice Romer. The plaintiffs were riparian proprietors on the bank of the River Thames at Wraybury; the defendant was, as the owner of a several fishery, proprietor of the bed of the river at this point. The issue raised was whether a small strip of land which had formed between the plaintiffs' ground and the ordinary level of the river had ceased to be part of the bed of the river, and, if so, whether the plaintiffs were entitled to it by the law of accretion. Mr. Justice Romer decided in favour of the plaintiffs. The defendant appealed, and their Lordships now unanimously allowed the appeal, with costs, and reversed Mr. Justice Romer's decision, holding that the land was still, in point of fact, part of the bed of the river; but they also declared that the plaintiffs must still retain all their rights as riparian proprietors.

At the National Gallery on Monday, a new picture, a "Battle Scene," by Jacob Weir, was hung in Room No. XII. It is numbered 1470.

## STATUES, MEMORIALS, &amp;c.

**DUNOON.**—Mr. D. W. Stevenson, R.S.A., has just completed in the clay a colossal statue of "Highland Mary," which, when cast in bronze, will be erected on the shore at Dunoon. Mary Campbell was born in 1761 or 1762 at the farmhouse of Auchnamore, behind the remains of Dunoon Castle. She was nurserymaid at Mauchline Castle, where Burns made her acquaintance, and became enamoured of her by the side of the Fail water in 1786. Her untimely death five months later called forth what is generally regarded as the purest and tenderest of his lyrics—"To Mary in Heaven." Having in view the site on which the statue is to be placed, the sculptor has designed the figure of Mary looking across the intervening waters of the Clyde towards the Ayrshire coast with a wistful look upon her face. The right foot is slightly advanced, and the body bent forward upon it. The head, admirably modelled, is that of a well-favoured, sweet, and modest girl. It is intended that this tribute to the "immortal memory" of the bard shall be unveiled on the 21st July next—the centenary of his death.

## CHIPS.

A new Primitive Methodist church and school has been recently opened at New Silksworth, Sunderland. The building is from designs by the late Mr. Joseph Shields, of Sunderland, and has been carried out by Mr. J. H. Cossar. The total cost, exclusive of land, will be about £1,800. The principal contractor was Mr. J. W. White, Sunderland.

Messrs. Fambrini and Daniels's architectural concrete works, Lincoln, have secured the contract for supplying the whole of the dressings for the Roman Catholic schools, Woodhall Spa. The above comprises plinth and stringcourses, buttress weatherings and date stones, moulded mullions, transoms, and entrances, traceried turret, with modelled bosses, finials, canopies, &c. Mr. R. Adolphus Came, M.I.B.A., architect, 27, Mecklenburgh-square, London, and Messrs. Oliver Cromwell and Son, contractors, Woodhall Spa.

A fire broke out on Tuesday night at 35, Bethnal Green-road, in a five-floored warehouse tenanted by Messrs. E. Sherry and Co., cabinet manufacturers and upholsterers. It was not overcome until the upper portion of the warehouse, in which the flames had broken out, had been burned out.

The work of erecting the new town hall, which Sir John Stirling-Maxwell, Bart., M.P., is to present to the people of Pollokshaws, will be begun on Monday. In order to provide a site, Sir John extended Bengal-street from the public school to Barrhead-road, and has widened it. The hall will be built on the north side of the street at its junction with Barrhead-road. The plans were prepared by Dr. Rowand Anderson, Rutland-square, Edinburgh, and the style of architecture is Scottish Baronial. Accommodation is provided in the main hall for 800 people. Allowing for the value of the site, the total outlay will be between £15,000 and £20,000.

The South Kensington Museum, including the India Museum and Science collection, as well as the Bethnal-green Branch Museum, is to be experimentally opened on Sundays from 2 p.m. till dusk. The new arrangement will come into force on Sunday next.

At St. George's Church, Newcastle-under-Lyme, on Saturday, the Bishop of Shrewsbury unveiled a stained-glass window, which has been provided by the parishioners as a memorial to the late Rev. R. Ward, who was vicar of the parish for nearly 20 years. The window has two lights, and depicts, in two scenes, the healing of blind Bartimeus. It is the work of Messrs. J. Hardman and Son, of Birmingham.

An inquiry directed by the Local Government Board was held on Tuesday week, before Major-General C. P. Carey, R.E., at Felixstowe Town Hall, with reference to an application by the Felixstowe and Walton Urban District Council for sanction to borrow £10,783 for works of sewerage in public and private streets. The surveyor, Mr. G. S. Horton, reported that of the £24,250 already borrowed £23,334 14s. 5d. had been expended. The public sewers were virtually done, and the outfall works were nearly completed, there being only a few lengths of submarine work to be done. Of the 40 private streets in the districts 23 had still to be made, and would be put in hand next autumn after the season was over.

The dispersal of the cabinet of Greek coins formed by the late Mr. Hyman Montagu was completed at Messrs. Sotheby, Wilkinson, and Hodge's on Saturday, and the entire collection of 816 lots realised the total of £8,976 15s. 6d. This sale is remarkable for the fact that the collection produced a sum considerably above the amount invested in it by Mr. Montagu, and this although it has been formed during the last six years.

## PARLIAMENTARY NOTES.

**THE CERTIFICATE OF THE SANITARY INSTITUTE.**—Mr. Knowles (for Mr. Rentoul) asked the President of the Local Government Board, on Tuesday, whether the Board had recognised the certificate of the Sanitary Institute as a certificate for a sanitary inspector under the Public Health (London) Act, 1891, section 108 (2) (d), whether any other public health bodies had applied for recognition of their certificates, and, if so, their names; whether such approval had been given, and, if not, the reasons for refusal; and whether the committee appointed by the Local Government Board three years since for drawing up a scheme for establishing one examining board in England for the examination of sanitary inspectors did draw up such a scheme, and, if so, when would effect be given to it.—Mr. T. W. Russell: The Local Government Board have approved, until they otherwise direct, of the Sanitary Institute as a body to grant certificates for the purposes of the section referred to in the question. The British Institute of Public Health applied for a similar approval, and the Board had reason to believe that application of a like character would be made by other bodies. The application of the British Institute of Public Health was not complied with, as the Board thought it desirable that a joint board should be formed consisting of representatives of various bodies interested in the subject, who should hold examinations and grant certificates for the purposes of the section. A committee was appointed in 1895 to draw up a scheme for establishing a joint examination board, and they have framed a scheme accordingly. The scheme adopted contemplates that the examination board should be incorporated under the Companies Act, 1862, and application was accordingly made to the Board of Trade. The Board are communicating with the Board of Trade on the subject.

New board schools are about to be built at Littleborough, from plans by Messrs. Butterworth and Duncan, of South Parade, Rochdale.

The Government Harbour at Dover, with torpedo stations, is to be completed in considerably less than the ten years originally stipulated. The Admiralty have leased a house on the Marine Parade, which is being fitted up for the purpose of permanent offices. There are now between twenty and thirty officials engaged in completing the surveys for the harbour. The harbour to be constructed will be more extensive than the 1844 scheme, the width being nearly two miles.

The will of the late Mr. John Lysaght, J.P., of Springfort, Stoke Bishop, and Hengrave Hall, Suffolk, the head of the firm of ironfounders known as John Lysaght and Co., Limited, of Bristol, has just been proved. The gross personal estate is returned at £424,123 15s. 3d., and, after deducting liabilities amounting to £4,964 7s. 6d., the net value is £419,249 7s. 9d. The personal estate abroad is stated at £737 0s. 10d., and there is other personal property amounting to £9,040, and aggregable property returned at £98,068 2s. The duty on the personal estate amounted to £32,177 5s. 9d.

When the present clock was recently placed in the tower of St. Nicholas's Cathedral, Newcastle-on-Tyne, a step necessitated by the larger size of the new bells, the corporation of that city gave the old St. Nicholas's clock to All Saints' Church, to replace the one that had done duty for a century past, and had now ceased to be reliable. The work of removing the clock from St. Nicholas's tower and installing it in its new home has just been completed by Messrs. William Potts and Sons, of Leeds and Newcastle. The framework and figures on the four glass dials of the clock have been painted and gilded afresh, while opal glass has been placed in the outer circle between the figures and the minutes. The lighting apparatus has been rearranged, and reflective mirrors added. The formal starting of the clock took place on Saturday.

The City Corporation accepted at their last meeting an offer from Sir A. Seale Haslam, late Mayor of Derby, to present to the City of London a bronze statue of the Queen by the late Mr. C. B. Birch, A.R.A., the conditions being that a suitable site in the City should be found for it. The owner's preference was for the space immediately facing the Royal Exchange. The statue is 9ft. high, and the pedestal is of similar height, and 6ft. 4in. square, and it is said to be the best likeness of the Queen in sculpture yet produced.

At a meeting of the Halifax Board of Guardians on Friday, the estimates for the new workhouse infirmary at Skircoat were considered. The building committee reported that No. 1 scheme, to provide 394 beds, was estimated to cost £95,935; and the No. 2 scheme, under which pavilions were intended to be erected to increase the accommodation to 642 beds, was calculated to cost £32,950, making a total estimated expenditure of £128,885. The committee recommended that No. 1 scheme be adopted, and their report was agreed to unanimously.



## Our Office Table.

THE annual report of the Home Arts and Industries Association has this week been issued—being larger and more comprehensive than heretofore it makes quite a thick pamphlet, recording an extension of the classes and increase of branches now affiliated with the parent society in various parts of the United Kingdom. The past year has been an uneventful one in the record of the association, which, however, continues to flourish, and 31 new classes have enrolled themselves. Subscriptions have not kept pace with expenses; but mainly owing to the indefatigable energy of Mrs. G. F. Watts, the "Watts Endowment Fund" started in 1895 amounts now to nearly £2,500, and will probably shortly be largely augmented by the sale of a fine picture presented in aid of the fund by Mr. W. B. Richmond, R.A. Among the subscribers supplementing Mr. Watts's subscription of a thousand guineas are donations of £50 from the Goldsmiths', the Clothworkers', and the Drapers' Companies, with like sums from Mr. J. Passmore Edwards, Mr. Hubert Herkomer, R.A., Earl Brownlow, Lord Burton, Mr. Wm. Agnew, Mr. Val Prinsep, R.A., Lord Rosebery, and Sir Chas. Tennant. Mr. Henry Tate gives £100, and Lord Iveagh £250. The yearly exhibition of works by the various classes is announced to be held next June in the Albert Hall. The following are willing to receive men and boys as apprentices in their own workshops, "provided the necessary fees are forthcoming":—Mosaic, Mr. W. B. Richmond, R.A.; metal and leather-work, Mr. C. R. Ashbee; cabinet-making and joinery, Mr. Reg. T. Blomfield, M.A.; and Mr. C. Spooner. Mr. W. B. Reynolds also will teach metal work. It will thus be seen that some names associated with design or with architecture as a profession are taking up manufacture as employers of labour. That an architect should do this is quite out of accord with the limitations imposed by the R.I.B.A., which ever seems to esteem the trim and smug professional jobber to the artistic designer, particularly whenever that individual endeavours to strike out a line other than that prescribed by Conduit-street conventionalities. Among the names figuring as vice-presidents or as members of the council of the Home Arts and Industries Association are the following architects and artists:—Messrs. Eustace Balfour, W. B. Richmond, R.A., Morton R. Peto, Maurice B. Adams, C. F. A. Voysey, Val Prinsep, R.A., J. H. Pollen, W. A. S. Benson, W. B. Sanders, E. J. Poynter, R.A., G. F. Watts, R.A., and Professor Ruskin.

On taking fresh measurements of the Parthenon, Mr. F. C. Penrose, P.R.I.B.A., has discovered, to his surprise, that the preserved portions of the Temple have remained without the slightest change since he first investigated the structure fifty years ago, when he made those original researches which have long been familiar to the students of Greek antiquities throughout the world. At that time neither earthquakes nor any other cause had affected the wonderful stability of this unique monument of ancient architecture. In conformity with the advice of Mr. Penrose, the work of rendering the entablature solid and secure is soon to be commenced.

THE City Commissioners of Sewers decided on Tuesday to give the necessary notices to treat for the acquisition of the ground required to widen the public way in front of Nos. 98, 99, 100, and 101, Fleet-street, as soon as the London County Council have agreed to contribute half the cost. The properties in question occupy the portion of Fleet-street between the south-west quadrant of Ludgate-circus and Bride-lane, and the London County Council will receive at their next meeting, on the 21st inst., a recommendation from the Improvements Committee to contribute one-half the cost of widening Fleet-street at this point from 45ft. to 60ft., the entire estimated cost being £31,500.

LORD HERSHELL inaugurated, on Tuesday, the Whitechapel Fine Art Exhibition, in Commercial-street, this being the sixteenth of the annual displays which Canon Barnett has organised. The collection brought together comprises upwards of 230 works, which will remain on view daily (free) up to, and including, Sunday, April 19. The pictures include Sir E. Burne-Jones's series of "St. George and the Dragon," which have a room to themselves; the same

painter's "The Golden Stairs," lent by Lord Battersea; the late Lord Leighton's "Michael Angelo"; Lady Butler's "To the Front"; Mr. Wylie's "Water Gate of London" (the Tower Bridge and surroundings); and the late Vicat Cole's large canvas, "Westminster," showing the Houses of Parliament and river in a rich sunset. Among the portraits is that of Mr. Gladstone, by Sir J. E. Millais, P.R.A. There are also works by G. F. Watts, W. Q. Orchardson, B. Riviere, Stacy W. Marks, B. W. Leader, Alfred Parsons, and other prominent artists. In opening the exhibition, Lord Hershell expressed his hearty approval of the Sunday opening of picture galleries, and accorded his approval to a suggestion that a permanent Art Gallery should be established in the district, at a cost of £20,000, a scheme which he commended to the notice of men of wealth.

SOME further discoveries upon the site of the monastery at St. Alban's, south of the abbey church (now the cathedral), have been made by Mr. Charles Henry Ashdown, and elucidate the plan of the building. The site remains unbuilt upon and laid in grass, and while the part nearest the abbey had been well mapped out in ascertained positions of cloisters and buildings, the further or southern portion was comparatively unexplored. During the summer many portions of the turf covering the foundations of the dismantled buildings in the Abbey Orchard assume a more or less yellow appearance, caused by the proximity of buried masonry to the surface of the soil, and consequently a lack of moisture to the roots of the grass. This was apparent in a marked degree during the long-continued drought of 1893, but still more so during last summer. Towards the end of last autumn a remarkably well-defined parallelogram was indicated by the burnt-up grass in a position approximating to the centre of the lower part of the field, and this has been identified by Mr. Ashdown and the Rev. H. Fowler as the great bakehouse of the monastery, rebuilt by Abbot Thomas de la Mare between 1349 and 1396. The longer axis lies parallel to the nave of the abbey, and to the Orielum, which is the nearest building previously discovered to the north, whose foundations are plainly visible near the seat. The length of the building was 65ft., breadth 25ft., and the average width of the walls 24in. An opening, 6ft. wide, probably a doorway, occurs in the north wall at one-third of the length of the wall from the north-west angle. At the south-west angle and exterior to the building evidences occur of a considerable mass of masonry lying just beneath the soil, but not yet excavated.

THE excavations on the site of the Roman city of Silchester in 1895 formed the subject of a paper read by Messrs. W. H. St. John Hope and G. E. Fox at the meeting of the Society of Antiquaries on Friday evening. The two insulae, or blocks, explored last year were those numbered XIII. and XIV. on the great plan, which is added to periodically as fresh buildings are uncovered, and is already beginning to show a nearly complete map of the central portions of the ancient city. The chief interest of two fine villas discovered in 1895 consists in the mosaic pavements, which compare favourably as works of art with the well-known examples at Bignor and elsewhere in Britain. In one of the houses is a room set apart specially for the worship of the household gods, the foundation for a shrine (corresponding exactly to one at Pompeii) being found in the centre. This is the first trace noticed at Silchester of private worship in Pagan times. The number of images or gods found altogether has been extremely small. The villas might have been described by the house agent of the period as "palatial mansions, suitable for rich city men."

THE sixth annual report of the Guinness Trust for the year ending Dec. 31, 1895, shows that the capital of the London Fund now amounts to £269,446. During the year additional buildings, containing 16 tenements, on the Vauxhall-square site, and four blocks of buildings, containing 456 tenements, on the Page's-walk site, were completed, and are now fully let. On December 31, 1895, there were 6,769 persons living in the Trust Buildings. The average weekly rent of each room was 2s. 1½d. The trustees have now provided 1,877 separate dwellings, containing 3,738 rooms, besides laundries, club-rooms, costers' sheds, &c., and are negotiating for an additional site. The capital of the Dublin Fund now amounts to £58,894. The buildings on the New Bride-street (Kevin-street) site were completed in January, and have let well during the

year. On Dec. 31, 1895, there were 710 persons living in the buildings. The average weekly rent of each dwelling was 2s. 9d., and of each room 1s. 9½d. A second block of buildings, containing 120 tenements, is in course of erection on the New Bride-street site, and will be ready for occupation during the year.

A CARPET lining made entirely from wood and paper pulp is one of the newest articles to be produced from that seemingly unfailing source—paper, says an American exchange. Carpet linings made from manila paper, folded in flat rolls, or otherwise constructed, are common enough, but the new type of lining is quite out of the ordinary. A carpet lining must be porous, flexible, smooth, and also moth-proof. These ends are obtained by running the pulp on the floor to an average depth of ¼ in., which will furnish an elastic foundation for the carpet. The pulp fills every crack, bad place, and depression, and forms a perfectly level surface. Exposure to the air dries the composition in a day or so. The carpet is laid directly upon this surface, which makes the poorer grades of carpets seem like the softest and most costly of pile textures.

## CHIPS.

THE old Royal Hotel and adjacent buildings at Weymouth, the property of the corporation of that borough, are about to be leased to a syndicate who propose to erect on the site a new hotel to cost £30,000 with furnishing, and an arcade to cost £5,000. Crescent-street will be opened up and continued as a 36ft. thoroughfare into George-street.

THE new wing and chapel which have been added to the buildings of the Little Sisters of the Poor at Manor-road, Stoke Newington, have been opened by the Cardinal Archbishop, Dr. Vaughan. The chapel is seated for 300 persons.

IN the ventilation of the Low Fell Schools, Gateshead, Messrs. Oliver and Leeson architects, Newcastle-on-Tyne, the "Climax" patent direct-acting invisible roof ventilator and improved air inlet brackets are being used and supplied by Messrs. Cousland and Mackay, ventilating engineers, Glasgow.

THE foundation-stone of a new workhouse infirmary, now being erected in High-street, Homerton, for the guardians of Hackney Union, was laid on Wednesday week. The building will cost £33,000, and is being erected from plans by Mr. W. A. Finch, of 76, Finsbury-pavement, E.C.

THE Council of the Royal Scottish Academy have resolved that, for the benefit of any of the community who might be unable to pay the usual entrance-fee, the exhibition should be free in the evening between seven and ten o'clock during the last week of this year's exhibition. It remains to be seen how far this arrangement will affect the attendance on pay-days of the frugal-minded citizens of Edinburgh.

THE Willerby Asylum extensions, near Hull, are being warmed and ventilated by means of Shorland's patent Manchester grates and patent inlet panels, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

THE new owner of what remains of the once famous Benedictine abbey at Glastonbury intends to take immediate steps to arrest its further decay. Mr. Hanley Austin, who has just come into the possession of the abbey by inheritance, has called in Mr. Edmund Buckle, the Bath and Wells diocesan architect, to see what can be done to preserve the ruins, and more especially the crypt of the nave, from further dilapidation.

ST. Andrew's Church, Grinton, Swaledale, will be reopened on Wednesday next by the Bishop of Ripon, after restoration, carried out at a cost of £3,000, from plans by Messrs. Hicks and Charlewood, of Newcastle; Mr. Simpson, of Darlington, acted as clerk of the works. The edifice has been newly seated in oak on the lines of the original sittings. Stained-glass memorial windows have been presented to the church, including one in the east wall, by Mr. C. E. Kempe, of London. The bells have been recast and retuned by Messrs. Taylor, of Loughborough, and there is a new clock by Messrs. Potts, of Leeds.

THE Wirral Railway, now called the Liverpool and North Wales Railway, between Hawarden and Liverpool, being now completed, was opened for traffic on Monday, having been inaugurated on Saturday by Mr. Gladstone. The new line runs from Birkenhead to Connah's Quay, crossing the Dee, which is there 480ft. wide, by a great low-level swing-bridge. The distance between the two places by this route is 17½ miles—nearly six miles less than the present route by way of Chester. The new line thus affords direct communication between Liverpool and North Wales.



## Trade News.

### WAGES MOVEMENTS.

**LLANDUDNO.**—A dispute has arisen between the master-painters and men, the latter having applied for 1d. per hour advance in wages and been refused, the present rate being 6½d. per hour. On Saturday night a deputation from the men had a conference with the masters, but with no satisfactory result, and the strike commenced on Monday morning.

**NEWCASTLE-ON-TYNE.**—The dispute between the bricklayers and plasterers engaged in the local building trade as to which body of men shall carry out certain work, has culminated in decisive action on the part of the employers. The members of the Newcastle and Gateshead Master Builders' Association held a meeting on Friday night at the County Hotel, Newcastle, with Mr. Walter Lowry in the chair, and it was then agreed that all previous efforts of the employers to bring about a settlement having failed, there was no other course open to them but to immediately lock out the two trades affected. This decision threw idle on Monday between 700 and 800 men employed on various works in course of construction in Newcastle and Gateshead.

### CHIPS.

An excellent week's business was reported on Monday from Tokenhouse Yard, resulting in a total of £130,527. The number of sales conducted was not large, but most of the auctioneers were successful in disposing of their lots. Suburban and country sales are reported to the amount of £93,926.

The Vicar of Bodmin is appealing for funds to enable the ruined chapel dedicated by the Grey Friars Monks to St. Thomas of Canterbury to be carefully restored. It is the only example of a complete 14th-century chapel in Cornwall, and possesses a crypt 40ft. long. It has an east window equal in design to any in England. The fabric is much damaged by neglect and desecration; but his architect, Mr. E. Sedding, of Plymouth, has reported that very little of the walls will have to be rebuilt.

At a general assembly of the Royal Academicians and Associates held on Thursday in last week, Mr. George Henry Boughton was elected an Academician. Mr. Boughton, who was born in Norfolk, but spent his youth in New York, has been an Associate of the Academy since 1879. He is best known by his portraits of Puritan dames with a background of snow-clad New England scenery.

Before the Common Serjeant on Friday, Alfred C. Gentry, 35, auctioneer, pleaded guilty to a charge of obtaining money by false pretences from persons whom he had engaged for fictitious situations, requiring a cash deposit. The total amount he had obtained in this way was stated to be £2,204. He was sentenced to 12 months' hard labour.

Nearly 200 members of the Bradford Historical and Antiquarian Society visited Bolton Abbey on Friday. The party proceeded in waggons from the station to the ruins, where an architectural description of the abbey was given by Mr. D. H. S. Cranage, M.A., Cambridge University lecturer, in illustration of his present course of lectures to the Bradford Philosophical Society. The Rev. A. P. Howes, M.A., rector, also gave an historical account of the abbey.

The body of St. Martin's (Carfax) Church, at the corner of Queen-street and Corn Market, Oxford, is about to be pulled down in order to widen the High-street. The church was rebuilt about 74 years ago from the designs of Mr. Plowman, a local architect; but the ancient tower was left, and will still remain.

Mr. H. W. Weston, surveyor to the district council of Eastleigh, Hants, has been elected as surveyor of Andover.

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### TENDERS.

\*. \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**ASTON CLINTON, BRICKS.** For work in connection with the erection of a villa at Aston Clinton, exclusive of bricks, lime, sand, and all plumbing, glazing, and painting. Mr. G. Luckett, Aylesbury, architect:—

Sherwin, Waddesdon	£396 0 0
Simon and Clarke, Wendover	885 0 0
Crook and Sons, Waddesdon	351 9 6
Fincher, Tring	325 0 0
Grimsdale, Aylesbury	315 0 0
Read, Watford	310 0 0
Grist, S., Limited, Aylesbury	288 0 0

**BARNET, HERTS.**—For alterations to the Three Elms, for Messrs. M. A. Sedgwick and Co., Watford Brewery. Mr. C. P. Ayres, 14, High-street, Watford, architect:—  
Brightman, C., Watford (accepted).

**BOSCOMBE.**—For additions to "Mons Elysee," Messrs. H. E. Hawker and Mitchell, Bournemouth, architects:—  
George and Harding (accepted) ... £1,225 0 0

**BOURNEMOUTH.**—For additions to "Headinglea," in Branksome Park. Messrs. H. E. Hawker and Mitchell, architects:—  
Lucas, J. W. (accepted) ... £1,130 0 0

**CANNOCK.**—For the supply of 350yds. run of unclimbable iron fence, 4ft. in height, round the allotment ground, for the urban district council:—  
Jellyman, S., Cannock (accepted) 3s. 11d. per yard.

**CHELSEA.**—For enlarging and rebuilding offices to all departments, and providing additional lavatory accommodation and new drainage at Star-lane School, for the London School Board. Second competition:—

Hammond, W.	£2,256 0 0
Grover, J., and Son	2,270 0 0
Neal, G.	2,203 0 0
Mallett, H.	2,214 0 0
Lyford, G.	2,203 13 3
Charteris, D.	2,184 0 0
Nightingale, B. E.	2,176 0 0
Downs, W.	2,143 0 0
Minter, F. G.	2,120 0 0
Foxley, G.	2,114 0 0
Lathey Bros.	2,098 0 0
Yerbury, E. A., and Sons	2,043 0 0
Lilly and Lilly, Limited*	1,887 0 0

\* Recommended for acceptance.

**CHELSEA.**—For providing and fixing small low-pressure hot-water apparatus for boys' hall on ground floor, and girls' hall and three classrooms on first floor, at Waterloo-school, for the London School Board:—

Fraser and Fraser, Limited	£139 0 0
Maguire and Son	186 0 0
Berry, Z. D., and Sons	179 0 0
Davis, G.	175 0 0
May, J. and F.	173 10 0
Wontner-Smith, Gray, and Co.	166 0 0
Rosser and Russell, Limited*	139 0 0

\* Recommended for acceptance.

**COVENTRY.**—For the addition of a physical laboratory to Bablake Schools. Mr. Herbert Chattaway, architect:—  
Worwood, J., Coventry (accepted) ... £375 0 0

**FINSBURY.**—For providing and fixing hot-water coils in corridors and tubular boilers in boys', girls', and infants' departments of Grafton-road School, for the London School Board:—

Defries, J., and Sons, Limited	£85 0 0
Cannon, W. G., and Sons	77 10 0
Vaughan and Brown, Limited	69 0 0
Ellis, J. C. and J. S., Ltd.	63 0 0
Fox, W. J.	62 10 0
Wontner-Smith, J., Gray, and Co.*	58 18 0

\* Recommended for acceptance.

**FINSBURY.**—For rebuilding the offices of all departments, and providing new drainage, at Bath-street School, for the London School Board:—

Lidstone, N.	£2,173 0 0
Grover, J., and Son	1,903 0 0
Cox, C.	1,970 0 0
Staines and Son	1,824 0 0
Munday, G., and Sons	1,810 0 0
Lawrence, E., and Sons	1,778 0 0
Beattie, R. P.	1,762 0 0
Nightingale, B. E.	1,739 0 0
Roberts, L. H. and R.	1,723 0 0
Akers, W. and Co.	1,721 0 0
Robey, J. T.*	1,626 0 0

\* Recommended for acceptance.

**HACKNEY.**—For erecting a new school for 895 children, with manual training centre and playground on top of school for boys, in Eleanor-road, Hackney, for the London School Board:—

Charteris, D.	£20,187 0 0
Munday, G., and Sons	19,912 0 0
Yerbury, R. A., and Sons	19,904 0 0
Lovatt, H.	19,611 0 0
Nightingale, B. E.	19,546 0 0
Roberts, L. H. and R.	19,170 0 0
King, W., and Son	19,157 0 0
Patrick, J. and M.	19,036 0 0
Cox, C.	18,935 0 0
Wallis, G. E., and Sons	18,350 0 0
Shurmer, W.	17,982 0 0
Lawrence, E., and Sons	17,981 0 0
Dabbs, W. M.	17,664 0 0
Treasure and Son	17,894 0 0
Kirk and Randall	17,892 0 0
Grover, J., and Son*	17,648 0 0

\* Recommended for acceptance.

**HACKNEY.**—For erecting a new school for 902 children, with cookery and laundry centres, special school and schoolkeeper's house in Windsor-road, for the London School Board:—

Treasure and Son	£26,161 0 0
Kilby and Gayford	25,980 0 0
Gregar, W., and Son	25,950 0 0
Dove Bros.	25,685 0 0
Grover, J., and Sons	25,145 0 0
Dabbs, W. M.	24,951 0 0
Atherton and Dolman	24,850 0 0
Shurmer, W.	24,724 0 0
Lawrence, E., and Sons	23,921 0 0
Cox, C.	23,497 0 0
Stimpson and Co.	23,460 0 0
Pattinson, W., and Sons	23,199 0 0
Charteris, D.*	22,973 0 0

\* Recommended for acceptance.

**ISLINGTON.**—For new house, Conewood-street, Islington. Mr. E. J. Harrison, architect:—

Ward and Lambie	£749 0 0
Dearing	722 0 0
Houghton	720 0 0
Hawkins and Wright	688 0 0
Marsden	679 10 0
Eddie	672 0 0
Wills	610 0 0

**KETTERING.**—For the erection of a mixed school and caretaker's cottage in Park-road, for the school board:—  
Barlow, F., of Rothwell (accepted) £7,200 0 0

**LEEDS.**—Two of the tenders provisionally accepted for the erection of section No. 1 of the hospital for infectious diseases on the Marston Hall estate, Seacroft (see our last issue, p. xvi) having been withdrawn, the Leeds Corporation have let the work in one contract to William Irwin and Co., of Leeds, at £28,135.

**LEEDS.**—For forming excavations for the arcades in New Brigste:—  
Speight, Jos., Chapel-town-road, Leeds (accepted).

**LEEK.**—For heating the workhouse infirmary, Leek, for the Leek Guardians:—

Ward and Nock, Birmingham	£633 0 0
Morwood and Son, Sheffield	545 0 0
Lowndes, E., Leek	514 0 0
Jones and Atwood, Stourbridge	490 0 0
Rosser and Russell, Birmingham	478 0 0
Trusswell and Son, Sheffield*	470 0 0

(Architect's estimate, £500.)

\* Accepted.

**LEEK.**—For erecting fire-station, shops, butter market, &c., for the Leek Urban District Council:—

Fielding, J., Alton	£2,275 7 0
Cornes, C., Hanley	2,080 0 0
Heath, J., Leek	1,966 0 0
Embrey, H. P., Fenton	1,927 0 0
Heath and Lowe, Leek	1,909 0 0
Grace, T., Leek*	1,796 0 0

\* Recommended for acceptance.

(Architect's estimate, £1,907.)

**LEEDS.**—For erecting fire-station, shops, butter market, &c., for the Leek Urban District Council:—

Cornes, C., Hanley	£2,620 0 0
Fielding, J., Alton	2,577 0 0
Embrey, H. P., Fenton	2,449 0 0
Heath, J., Leek	2,394 0 0
Heath and Lowe, Leek	2,332 10 0
Grace, T., Leek*	2,289 0 0

\* Recommended for acceptance.

(Architect's estimate, £2,476.)

(The scheme is subject to the Local Government Board authorising the Council to borrow the requisite sum to cover the cost.)

**LINCOLN.**—For the erection of a new bank at Lincoln, for Messrs. Peacock, Willson, and Co.:—

MacKenzie and Sons, Newark	£5,223 0 0
Pattinson, F., Ruskington	4,719 0 0
Wright, W., and Sons, Lincoln	4,689 0 0
Otter, M., and Co., Lincoln	4,590 0 0
Pattinson, W., Ruskington	4,480 0 0
Maxey, W. H., Sleaford	4,050 0 0
Baines, C., Newark	3,999 0 0
Wadsley and Co., Horbling*	3,900 0 0

\* Accepted.



## THE BUILDING NEWS

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"WHEN DAFFODILS BEGIN TO  
PEER."

WE moderns have lost much of the old delight in spring, through losing most of the old dreariness of winter. If we had lived for the last four months like people in a beleaguered city, with little fresh meat and no vegetables; if we had scarcely seen a flower since November, or a fruit except half-shrivelled apples, the advent of "April with his shoures sote" would be like the coming of a new heaven and earth to us. It was so to our ancestors for generation after generation. Less than two centuries ago Sir Richard Steele suggested, as a startling novelty, that it might be possible, by the help of glass, to have some kind of indoor garden even in December. His contemporaries thought the idea too good to be true. Some of their early attempts at realising it still remain; and, from the heavy stone columns and entablatures which compose them, we can well understand that they found it difficult to make a conservatory flourish. A hundred and fifty years earlier there were hardly any edible roots, either for man or beast, in the cold season. Cattle generally had to be killed and salted, because, if a long frost set in, there would be no food for them, and altogether there was some excuse for our forefathers if they comforted themselves during the dark days by being "wrapt and thoroughly lapt of jolly brown ale and old."

Yet all hardships doubled their delight in the pleasures of existence. "The sweet of the year" came in, and they burst into irrepressible song, like the birds. The joy of spring runs through their literature, from Chaucer's poetry to Izaak Walton's prose. And, even more universally, it runs through their architecture, too. The great mass of Mediæval foliage carving is simply a carving of the types of spring: an attempt, more successful than that of the wise men of Gotham, to keep it with them through summer and winter. It is strange that this has been so much overlooked. Volumes have been written about the need for studying nature, and imitating nature; but most of them have no word about the need for copying it at the moment when it is fullest of life and force. It is now, when vegetation first starts into growth, full of spirit and freshness, that it has most to teach us; it is now that, if we look closely, we shall find where what used to be called "conventionalisms" come from. Three-fourths of them are not conventionalisms at all. They are simply enlarged reproductions of the exquisite lines and curves which anybody may see for himself in our commonest weeds, though only when they first start above the ground. To see them, it needs to look closely; to see them at their best, it is well to have a glass. But there they are, and what the old workmen did was mainly to enlarge them ten or twenty times, so that all the world might see them too. Now is the time. They will be gone, with few exceptions, in three or four weeks. The leaves will have uncurled, the stalks will be long and slender, instead of crisp and sturdy; the foliage will have flattened out, and be thin and paper-like in comparison. Then it will be big enough to catch the vulgar eye, which disregards it at its best. Then the pseudo-naturalistic decorator—if such a decorator still remains—will notice it, and gather it, and take it for a model; and then he will fail, for the thousandth time, as he has been failing

through the fifty years since pseudo-naturalism came in.

To some of us in our very early days a carver was always a man with a jug. Not a jug of beer—though, if report spoke truly, it was rather too often that—but with a jug of water, from which there protruded a flabby twig of oak or maple or briar, gathered some days before. By turns he gave a glance at the twig and a stroke with his chisel, repeating the process till his work was done. Then ensued great admiration of the faithfulness of his copy, but no misgiving as to the wisdom of copying what was tame, flat, and faded. Any sort of dogma can be impressed on most people's minds by ceaseless repetition, and the dogma that every true copy of nature must be beautiful had then been repeated more than *ad nauseam*. Unless a man was prepared to be cast out of the synagogue of art, he did not dare in those days to deny it. He would have been, morally and spiritually, torn to pieces if he had dared to say, as Mr. Whistler rightly does, that to copy nature without selection is to sit on the keys of the piano. Under these circumstances, all that the spectator might dare to ask was whether the carver had shaped his leaves like the leaves in his jug. If he had, high authorities declared that there was an end of the matter. His production must be admirable, and it was the duty—almost the religious duty—of the world to admire it. Long homilies were preached to this effect soon after 1860, when the Oxford University Museum was built. A company of carvers with jugs had been turned on to the stone capitals there to imitate all the plants, common and uncommon, which took the fancy of the authorities. Now if these carvers had had experience enough to know, or insight enough to discern, that the essence of good carving is the life in it, and if they had seized their types in the early spring, when their life was at the fullest, and had enlarged them half a dozen or a dozen times, as the Mediæval carvers would have done, they might have given an impulse to carving which would not have died out yet. The old types had been exhausted, it was high time to get new ones; but unfortunately they imitated the new ones when they were tame and flat. They copied them as they were in summer, not as they would have been in spring. Their work in consequence was an ambitious failure. It fell flat in spite of the loud flourishes of trumpets in the newspapers and magazines, and all that seems remarkable about it now is that anybody could ever have deluded himself into thinking that he liked it.

Now, as ever, there are people with eyes and people with no eyes, and the latter constitute an overwhelming majority. They are nearly always wrong, but they rule by their numbers. They make the customs and set the fashions, and decide, amongst other things, what sort of training a student is to have. If he attends a school of art, for instance, they set him to draw acanthus leaves: not actual ones, but Greek or Roman sculptures of them. They do not know that here in England real live foliage of acanthoid types grows wild by every hedge, and no man regards it. The reason is that it needs close looking into. The Greek acanthus is a large, coarsely-growing plant, able to force itself on the most unobservant. English vegetation of this character is small, and needs to be gathered and studied. But even the Greek acanthus would suggest little to an ordinary carver, except in spring. Then it has all the curls and ridges, the strong stems, the raised margins and contrasting bosses and hollows which we are accustomed to in Classic capitals and cornices, and which we are taught to look upon as devices of the ancients. The ancients, however, as the tradition about the origin of the Corinthian Order distinctly tells us, copied the plant as

it was coming up in early spring with all these things about it. The Mediæval sculptor mostly did the same with his models, and it is to this fact that they owe their life and vigour and crispness. It is true that sometimes, as art decayed, he had a transient fancy for decay in nature. Then he studied, not the exquisite curves of unfolding vegetation, but the harsh and broken ones of leaves marred by frost, by blight, by parasites. There are exceptions to all rules, and this is the exception to the rule which made spring the carver's study-time. But if in his morbid moods he sometimes passed from the types of April to those of November, the flat, fully expanded leaves of middle summer never attracted him. He saw neither prophecy nor history in them; they were not a forecast of what would be, nor yet a record of what had been, and he left them to his pseudo-naturalistic successors of the 19th century.

Who has not been supplied to his heart's content with "suggestions from nature," and who has ever turned these suggestions to any good use in art? Clever draughtsmen have published—in the BUILDING NEWS and elsewhere—hundreds of effective sketches showing leaves, seed-vessels, berries, and the like. As drawings, many of them are charming; but as motives for decoration, they have failed. Nobody takes hints or ideas from them, and they end where they began. The fault is, our artist friends have gone to work too late in the year. They have taken fully developed forms instead of forms just beginning to develop. They have missed the lines of force and crispness of growth. They have delayed till the interest of their subject had evaporated. The old carvers marked the different ways in which different buds unfold; the modern draughtsman seldom sets to work till this unfolding is over and done. Then he takes a specimen leaf—probably the most regular one he can discover—makes an outline of it on paper, and combines a number of these outlines into a pattern. Next he gathers a different leaf, and makes a different pattern, and so he goes on to the end of his book. There is no more art in this than in the feminine occupation of sticking dried fern-fronds on fire-screens or vases, and no more beauty in the result. And more than this, the draughtsman fails because he will not stoop to small specimens. If he would drop his larger models—his hop-leaves and vine-leaves and the like—and just look at the foliage of a buttercup, or a dead-nettle, when it is scarcely big enough to handle, he might, indeed, learn something to his advantage. *The smallest things are the strongest*, and their wonderful strength will impress everybody, if the carver only enlarges them till everybody can see them. This is one of the secrets of the ancient workman. His successors to-day do not know it, or do not believe it, and they wonder how he managed to put all this energy and vitality into his productions. They could put as much into their own if they would do as he did, and study small strong forms when they first show themselves in early spring.

There was a discussion in our columns some years ago, as there have been discussions in all sorts of places for the last 50 years, about the origin of Early English foliage. One authority thinks it was an imitation of clover, and another of wood-sorrel; while many more say that it came from the water-avens (*Geum rivale*) which, with its flowers of claret, buff, and emerald-green, borders the burns and salmon-rivers of the North. If you ask the carver how the enormous stems arose, where the raised veins sprang from, and the convex leaflets with their flattened margins, you are told that he himself invented them. Certainly he must have done, if he founded his favourite type on anything in the three plants named above. And though there is



an English flower, not specially rare, which has all these features and many more, one may live half a lifetime and never note them in it. Go to the right places, at the right moment, and you may see Early English foliage growing wild, as if it had escaped from the portal of Peterborough or the choir of Lincoln. See the same plant when it is further advanced or less luxuriant, and it seems only one of our innumerable trefoiled forms, with no special claim to distinction, except for its lovely blossoms. The buckbean, for that is the species in question, was formerly found in the ditches on Hampstead Heath. But it could scarcely hold its own there, even in the days of freedom and wildness, so that it is not likely to have survived till now, in spite of notice-boards and "improvements," and the London County Council. It still grows, probably, in Epping Forest, as it does in a hundred other places, lingering on in spite of draughts and poorness of soil, and it hardly suggests 13th-century work there. But see it once where it is strong and happy, say on some little strip of marsh and peat just above the sea-level on the South Devon coast, see it when its buds first begin to uncurl, and when its lobes are ribbed and rounded, its leaves all smooth and succulent, and its stems half as broad as they are high! You have been lectured all your life about "conventional" foliage, and here it is, growing and thriving, conventionalisms and all. You can scarcely believe your eyes; but it is only to be seen so in the spring.

Of course, this does not mean that any carvers, early or late—Classic, Gothic, or Renaissance—found the precise groupings and arrangements they wanted in their work growing ready-made for them. It was these groupings and arrangements, much more than the foliage types themselves, that they did design and invent. Art is nature *plus* mind, and it is on points such as these that mind appears. The carver bent his stems, and crossed them and intertwined them, as it suited him; he did not hesitate to do what nature rarely does, to add a leaflet, or even two, to his trefoiled foliage, nor to combine that foliage with the runners of a twining plant. In the Chapter-house at Southwell, where the carving comes nearer than it does anywhere else to common, everyday nature—the sort of nature which is recognisable even by "the man in the street"—we find naturalistic maple-leaves springing from a stem which might belong to a honeysuckle. In much older work, both in England and abroad, acanthoid foliage was formed into scrollwork, which is far from being its natural character. Similar freedom of treatment is found everywhere, as it ought to be, and our present-day carving is an improvement on that of twenty years ago, because it has more design and invention in it than that had. But art is not all human thought, any more than it is all nature: it needs both elements, and the best time to study nature for the carver's purposes is now—in the early spring.

#### UTILITARIAN BUILDINGS.

AS far as our streets and modern buildings go, the architect is no longer trammelled by the Orders and styles which a few years ago he was wont to consider. The old Classic rules or Mediaeval precedents have ceased to trouble the actively engaged practitioner, who has no time for leisurely studies and lucubrations. There is no longer that hankering after old models which we used to see thirty years ago, when one had no sooner done with one revival before another took its place in public favour. French or 13th-century Gothic, Venetian Gothic, Renaissance, Queen Anne, Flemish, a recrudescence of Tudor have all appeared within a period dating from the sixties. But not one of those styles has been taken up or held undisputed sway, with

perhaps the solitary exception of Gothic for ecclesiastical buildings, though even the spirit of the modern church designer has changed so completely that we can hardly compare a church of the late Sir Gilbert Scott's earlier period with one of today. But it is quite clear to everybody that a line can be drawn between monumental and decorative buildings and those for utilitarian purposes. The problem is chiefly how we can make the latter class of buildings—commercial and secular—architectural; how we can rescue them from the hands of the mere engineer and manufacturer. An age of unparalleled restlessness and activity has rendered it quite impossible to employ the same methods and styles which were used forty years ago in our warehouses and commercial buildings. We feel intuitively that it would be superfluous and wrong to wrap up our warehouses, shops, dwellings and schools, hospitals, and such like buildings in the habiliments of Greek, or Italian, or Gothic; to insist upon Vitruvian, Palladian, or Mediaeval canons in the proportions of our windows, rooms, or other features when other more pressing requirements of a technical and engineering kind have to be dealt with. The architect who is abreast of his time finds it safer and better to treat these useful buildings structurally first, instead of troubling himself anything about style, and it is on this principle that our secular buildings at least are beginning to be treated. Instead of putting the building out of sight, as something to be left to the builder and his coadjutors in the various trades, the architect is now recognising it as of primary importance, taking first the structure in all its nakedness and absolute utility, and treating it as a matter of simple construction. The modern architect must provide for every want, the necessary ironwork, fireproof construction, hydraulic and other lifts, the electric-lighting installation, ventilation, and heating apparatus. But he must do so as a general officer arranges and marshals his forces, devises his modes of attack and defence; not as a contractor or as a mere commercial caterer of a public entertainment provides all plate, employs cooks, and arranges with wine merchants and theatrical managers at a price in a perfunctory sort of way. In one word, the architect must avoid piecemeal delegation of duties as far as possible; it does not do for him to leave them to the engineer or the manufacturing specialist. He must make himself master of each trade; calculate the working loads his girders and floors ought to bear, and the means of support, by pillars or otherwise; arrange for staircases and lifts and their details; make plans for the heating and ventilating engineer to work to, and lay down the "wiring" arrangements for the electric installation. No doubt it will be said these are not architect's duties; that they withdraw his attention from the building as a whole, and tend to cramp his artistic powers. This sort of argument is what we are accustomed to hear, and it is quite true if we are to regard architecture as an art for its own enjoyment, like we do painting or music, and as having nothing to do with use or fitness for everyday life. But the "fine art" dilettante view has long since ceased to exercise control. The architecture of our utilitarian structures must subserve the objects of the building. The idea that architecture is to be learned by following rules as to "diameters" or "modules" of Classic Orders or by following harmonic or numerical ratios, is exploded; so is the subsequent belief in eclecticism, which has left our streets full of scraps of every style from Egyptian to "Queen Anne." The discussion and criticism of these theories and styles have done good; they have brought into review the modes of building exercised by diverse people and nations, but they have failed to give us a national style of building in proportion as

we have lost sight of the fundamental root of all good architecture, and have taken the products instead of the principles.

A marked distinction is to be noticed between the utilitarianism of the builder and engineer and that of the architect as it is expressed in our ordinary buildings, and the reason is simple. In the first the utilitarian features are repulsive and hard; they do not unite with the architectural features—they are separate. So also in the former, the art is superadded; it is put on as a garment, something that has no affinity with the structure, no relation to it; but in the latter the art is part and parcel of the structure, it is another name for the skill exhibited in its arrangement. Upon this distinction—obvious enough to the real artist, but extremely hard to be learned or grasped by the mere dabbler in architecture or by the average employer—real honest art rests. We have oftentimes looked at the ordinary "office building"—the block of offices as we see it in the City, Broad-street, or Chancery-lane. A pleasant and cheery face it may wear for a time as long as the brightness of the stone or the colour of the brick remains; but one cannot help seeing the hard matter-of-fact building behind, which the mere screen or front conceals but only too imperfectly. The ugly-shaped window may be framed by a Greek or Renaissance architrave, or pediment, or carving; but it reveals, notwithstanding, hurry and want of purpose for its position. In the arrangement and distribution, or repetition, of external features one sees whether they are genuine or affected, dictated by the position of partitions or columns, or intended as a copy of some other building. Here is a gable; does it indicate any main division, or emphasise a council room, or is it merely a whim to reproduce a street bit from Bruges or Lisieux? The latest shop-front is a piquant imitation of some 17th-century small-paned window, one or two survivals of which are to be seen in the City, or may be noticed in some of our old towns like Chester and Shrewsbury. But how absurd it looks beneath a red-brick front of ordinary design, and with the modern iron columns and fittings within! The average City bank and insurance office, the large West-end shop with its often pretentious display of quaint features and affectation of antiquity, are afflicted with this fashion. These buildings are all utilitarian in their purpose, are often cramped for space, and therefore have to make use of the modern methods of construction, in which iron is the chief factor. The builder, the engineer, and the business are in evidence, in spite of the best endeavours to exclude them; it would therefore be far wiser to openly accept the fact and do all we can to make a "virtue of a necessity," and to express and emphasise as far as possible the construction and the fittings; but this effort seems more than the average builder or architect can make. He would require almost a different education and training to fit him for the task of turning the useful into the beautiful. He must unlearn his modern art creed, fight through the Philistinism of the modern "builder-decorator-architect" idea, sit at the feet of the Gamaliels of the old craftsmen, before he can arrive at that blissful *utile dulci* state. It is just because the modern designer has been taught that a building can be made architectural by a little addition in the way of ornament, or the imitation of some other building, that it is so hard to teach him. He will persist in using the same forms of ironwork, the same patterns of castings, the same stock patterns of decoration, the same fittings, because it is easier, and saves him the trouble of thinking out anything better or more suitable to the purpose. Hence it is that the utilitarian building in which the architect has no part is so often hard



and repulsive, while that which he makes his own has a distinctive character which proclaims its use in the most effective manner. We have little space here to point by way of illustration how that character may be obtained. The examples we have taken are only a few of those buildings in which utilitarian requirements have to be met. Baths and wash-houses, warehouses, horticultural and farm buildings, have each a particular use. The modern shop or restaurant makes by far the larger demand on the architect of our street buildings. If we enter one of these we find the iron column and girder largely used in carrying upper stories and walls; there are skylights, shop-fittings, counters, staircases, and lifts, absolutely necessary, but, as a rule, very ugly and intractable features. Is the architect justified in leaving them alone, or is he to conceal and disguise them? The question is not one to be easily answered. When we look at some of the attempts to conceal or smother these features with decoration, we feel constrained to say, "Leave them alone." They are at least useful and necessary, and as such are truthful. The decorator often aggravates the offence by trying to make ornamental those things which have no right to be so treated. The true artist never confounds the constructive and the decorative. If he cannot make the iron column or the ceiling girder ornamental or decorative in itself, he leaves it alone, or tries to mitigate its objectionable points, but he never attempts to conceal its real purpose. He may space or arrange these things in the plan, but directly he attempts to make them ornamental—to counterfeit by external additions and superficial decoration—he is on the wrong track. Our remarks apply more particularly to old buildings which have been converted into shops or restaurants, where the ground-story walls have been removed and girders inserted to carry the upper floors and partitions. When the architect is untrammelled, as in a newly-designed building, he is master of the situation, and he is wiser if in such cases as we have mentioned he rather exhibits than seeks to hide utility, and turns his construction to the best account—a truism in architecture, but one, nevertheless, constantly needing reiteration.

#### THE NEW ENGLISH ART CLUB.

THE exhibition of this society's work at the Dudley Gallery is, on the whole, less sensational or pronounced in its impressionism—a phase of modern painting which the New English Art Club have sought to develop and promote, and no doubt there was justification for a movement or artistic revival after so much commonplace and traditional work of the weakest kind. We do not agree with that extreme school of impressionists who are ever seeking to defy all our conceptions of drawing and colour, who delight to put grotesque and often eccentric visions of nature before us; but these extremists of art ought not to shut our eyes to those aspects of nature which the members of this club are seeking to embody. On entering the gallery the first numbers are studies and sketches by those exponents of the new school who have made a deserved mark. Moffat Lindner exhibits lovely colour, breadth of light and shadow in the sketch, "The Bjora River, Norway"—done with a liquid brush in few strokes. His impression of sunset on cliff, which is gilded with bright orange, and the expanse of blue sea (54) in "Hengistbury Head" is not an exaggeration of the contrast seen when an effulgent afterglow lights up the edges of a cliff against the cool blue water. "After Sundown, St. Ives Bay" (99), is another instance of this better kind of impressionism. H. B. Brabazon sends some admirable water-colour sketches, as "On the Riviera" (5), "Evening in

Murcia," "In Venice" (16), which are charming notes of colour. We must also mention Miss R. G. Godlee and Miss Alice Grant as exhibitors of delightful sketches. The latter lady's views of "Scheveningen" are studies of suffused haziness and delicate hues of sunlight. The sketch of sea and bathers (19) is luminous, soft, and opalescent in its tone. Joseph Pennell shows his unerring skill as a pen-and-ink sketcher; the view down the Quadrant, Regent-street, is spoilt by the wild-looking cloud which seems to destroy the perspective of this rather uninteresting sweep of houses. His sketch of Rome (15) is feeling and crisp, except that the shadow of the columns in the middle distance is too heavy. James Paterson gives us a sensible piece of impressionism in the way the light and shadowed masses of foliage are managed in "Somewhere" (33)—a glade of trees in a forest; strong colour and drawing are also shown in Bertram Priestman's "Cutting Wursels" (34). Misty sunlight is effective in J. Buxton-Knight's "Canal" (38), with its canal and barge. The nude figures and draperies in Henry Tonk's "The Happy Island" (36) are full of grace and colour. A symbolised and very beautiful blending of colour is to be found in "A Toilet," where two girls in a boudoir are engaged in bedecking themselves with flowers. A note of colour is seen in the glass lustre vase with a scarlet japonica. The same artist's full-length portrait of "Miss Falcon" (64) is pleasing as a piece of character and colour portraiture of a young girl in red dress and white apron, a departure from the ordinary portrait ideals one sees so often. Walter Sickert has not this time given us the half-lighted music-hall, but has gone to Venice for inspiration. He sees in colour, light, and shadow the beauty of nature. His bold and admirable drawing, "The Lion of St. Mark" (96), is strong in the latter qualities of light and shadow rather than detail. His "Sirocco" (100) is also charming as a study of gleaming light and atmosphere in the canal scene. Another master of this school, P. Wilson Steer, is not seen at his best in his portrait of "Miss Molly Dixon" (46). The momentary impression of the young lady dressed in a pink blouse against a grey background is somewhat doll-like; the right arm of the young lady is invisible and gives a deformed appearance—surely the drawing here is at fault. The momentary action conveyed may, however, explain this as the effect of movement, but the colour is not harmonious. His "Richmond Castle" (58) and "Easby Abbey" are on the same ground wanting in the quality of repose. But the admirer of this aspect of seeing nature sees in the very crude and dabby-looking view of the last the sparkle of light on the trees and the rustling of the leaves in the wind. It is the painter's presentment of a breezy sunny day. Admirable tone is to be seen in David Muirhead's sketches of landscape, and in C. E. Holloway's silver-toned river view of "Cheyne Walk" (49). The effect of storm on sea in Geo. Thomson's "After a Storm," and his "Strand-on-the-Green" (52); the colour and vigorosity in L. Blatherwick's "Crofter's Garden" (80), with its sea beyond, are masterly. Mark Fisher's contributions, "Algiers" (73) and "Pond and Willows," a large landscape (67), are as usual in his sparkling manner; the former is bright and sunny, the latter is spoilt by its spottiness of effect and lack of repose; but there is the sparkle of light on the foliage and the flickering sunbeams through the willows.

Will Rothenstein's figure subject, "The Swordsman" (39), is effective in colour—the portrait looks like Mr. Cuninghame Graham. A. S. Hartick's, "The Kirking of the Incorporated Trades of Kirkcudbright" represents a procession of burghers in black, headed by scarlet-uniformed halberdiers, going to kirk. It is interesting in its grim

mournful character, and the subject was at least a difficult and trying one for a painter, and, but for the scarlet-coated leaders, the effect would have been particularly lugubrious and funereal. But perhaps the cleverest figure compositions are those on the opposite wall by W. L. Windus. The larger of these represents "A Patrician," A.D. 60 (87), an unfinished sketch for a picture. A Roman patrician reposes in semi-nudity on a couch, surrounded by his courtesans and admirers; one places a wreath on his head, and young maidens, full of mirth, are dancing to please the old voluptuary. The animation, grouping, and colour are remarkably good, and remind one of the Venetian school. The other small subjects, "The Flight of Henry VI." (84) and "The Second Duchess" (88), are pre-Raphaelite in manner, and extremely clever and imaginative. Fred. Brown's "A Glimpse through the Wood" is a strong piece of impressionism and colour; and A. S. Hartick has a pleasing colour study, "The Little Red Girls" (95), in which the trees and sunlight effect are very vivid. Francis Bate is too flat and smooth in his garden scene; there is an impression of summer, but the work fails from neglect of those ordinary rules of drawing and colour which even impressionists cannot dispense with altogether. Other subjects, showing more or less the desire to escape from the ordinary pictorial traditions, are hung, and of these we may name T. Charles's great homestead view, "By the Moonlight"; Roger E. Fry's "Golden Barge" (90); James Paterson's "A Manse" (93); B. Priestman's "The Groote Kerk (Dordrecht)" (78). Strongly painted, but rather too large, is J. Buxton-Knight's landscape, "Bohemia" (61), a gipsy encampment on a common. Arthur Briscoe's studies are also noticeable for their unconventional impressionism after Monet; and altogether the present exhibition gives evidence of a desire among some of our leading painters to seek aspects of nature which appeal rather to the mind and emotions than to the eye for commonplace pictorial qualities.

#### COUNTY LUNATIC ASYLUMS.—XLII.

By GEORGE H. BIBBY, F.R.I.B.A.

##### LOCKS AND KEYS.

THE arrangements required for the locks and fastenings of a large asylum are frequently of a perplexing nature, and the cost of providing these is always very considerable, for it is most essential that all should be of a reliable manufacture and of thoroughly good quality, as the result of the failure of a lock at a critical juncture might involve a terrible disaster to patients and attendants.

Usually there should for a large asylum be a set of keys for the ordinary nurses and attendants which would only command the locks of the doors of those apartments with which they would be exclusively interested, thus preventing the subordinate officials from intruding upon portions of the asylum with which they would not be concerned.

There would be sub-master-keys for the head attendants and head nurses, enabling them to obtain access to all the wards under their especial care, but not to apartments occupied by the opposite sex, or to rooms used for those administration purposes not connected with their duties.

Superior master-keys would be provided for assistant medical officers and other persons permitted to have the run of the greater portion of the asylum, and for the medical superintendent a grand master-key would be provided, giving him means of access to the whole of the wards in the asylum.

Other sub-suits of keys would be required for the storekeeper's, kitchen, and other administrative departments; but in arranging the principle upon which asylum locks and keys should be provided, the leading idea (after safety) is to reduce, as far as practicable, the number of different kinds of locks that any one official has to open, thus reducing the number of keys to be carried.



All exterior doors, and those doors which lead from the male to the female side, should be supplied with locks which can only be opened by superior master keys, to be kept in the possession of the higher class of officials.

Sometimes a lower grade key is capable of being altered by having a portion removed with a file by an attendant, thus giving him the means of opening a lock that he is not entitled to touch. This difficulty would easily be avoided by contriving that servant-keys should have fewer wards or parts than the master-keys, and thus making it impossible that the servant-key could be used for a higher class lock, unless a piece could be added to the key—a much more difficult operation than reducing the key with a file.

The keys of the cupboards in each ward, or set of wards, should be so arranged that the nurses and attendants shall not be able to interfere with, or take stores, &c., from, each other, as it is important that waste of materials be traced to the responsible persons.

It has been recommended that the pin of the keys should protrude a little on the opposite side of the door to that in which the key is inserted, thus rendering it practicable upon an emergency to open the door with a screw-driver, the end of the key having a sinking to receive the tool, this plan being adopted to prevent the danger or inconvenience which might arise should the attendant be inadvertently, or improperly, locked out.

Windows, shutters, valves for gas, ventilators, fire-guards, and many other articles all require to be locked up, so as to be free from interference of the patients. The locks and keys of an asylum have to undergo very much more wear than those of any other class of buildings, and therefore should be very substantially made, and all the working parts should be of gunmetal rather than of steel in those cases where the locks are especially exposed to moisture.

In the event of a struggle with a violent and dangerous patient, the instant use of a key may be of great importance, therefore the escutcheon of the door locks should, for the patients' wards, be bowl-shaped and sunk into the door. By this arrangement some assistance is given to the attendant in directing the key into the keyhole, which at a critical moment might become of no little use.

A very useful arrangement is a patent silent indicating lock, which shows very plainly whether a door be unlocked, locked *once* with a servant-key, or *twice* with a master-key. A great advantage of this lock is the facility for opening doors rapidly in the event of an alarm of fire, provided that master-keys are obtainable by the attendants (in the absence of the holders of superior keys) from glazed boxes, only to be broken during times of emergency, and then only with the accompaniment of an electric alarm to the usual authorised holder of such master-keys.

There is a silent indicating lock for single rooms, which may be opened and shut by the perfectly silent action of a knob, which also indicates whether the door is locked or not, and, *when open or closed*, the knob can be made fast by turning the key, to prevent patients from tampering with the lock, and a *double* shoot with the master-key would prevent the servant-key from unlocking the door. A modification of the above-described lock is applicable to passage doors, so that though the lock can only be opened with the key, yet it can always be fastened by simply turning the handle.

Locks of strong quality, suitable for dormitories, single rooms, store-rooms, and workshops (being 5½ in. dead locks, *en suite*, locking twice to the master-key, and with steel-bushed keyholes) are obtainable at a cost of 8s. 6d. for tumblers and 11s. 6d. for levers, while for corridor doors, staircases, and communication doors generally, suitable 5½ in. strong mortise locks to lock and spring may be purchased at about 10s. for tumblers and 13s. for lever locks, or for a superior make, with gun-metal fittings, at from 12s. to 15s. each respectively.

A more expensive lock is required for the central administration offices, the external entrances, day-rooms, reception-rooms, bath-rooms, kitchens, &c. These might be 6½ in. best mortise two-bolt locks, brass bolts, keyholes bushed with steel, hard steel followers bushed with metal, *en suite*, and to lock twice to the master-keys, the cost of these being from 17s. to 20s. each, exclusive of furniture, which would cost about 6s. or 7s. in addition.



THE CHAPEL ROYAL, EDINBURGH.

For the attendants' and some other apartments (where the doors are to be opened with a knob inside, but with a key only on the outer side) a 6½ in. one-bolt mortise lock, with brass bolts, may be obtained at from 11s. to 13s. The locks for water-closets must be without any bolts or fastenings on the *inside*; but there should be provided 5½ in. dead locks to lock once from the outside, and which should cost about 5s. 6d. each. Dead locks should also be provided for the shutters of the single rooms, and so arranged as to lock over the windows when closed, and flush back against the wall when opened.

The keys given to the attendants and officials of asylums require to be systematically arranged in suites, and should be distinguished by variations of form as well as by the names of the apartments and the position of the officials holding the keys; frequent changes of the nurses and attendants of most asylums render it undesirable that the names, even of the leading officials, should be engraved upon the keys. The cost of asylum keys may be estimated as follows:—The lowest class of key, servant-key, may be purchased at from 3s. to 4s. 6d. each (suitable for the locks before mentioned), and the cost of engraving names of rooms and officials would be 1s. 6d. in addition, or if letters and numbers should be considered sufficient the engraving would not cost more than 6d. or 9d. The key of the next class, servant-master key, is charged at the higher rate of 6s. 6d. per key, exclusive of engraving and numbering; while the cost of master-keys rises to 12s. 6d. and grand-master keys to 21s., with corresponding additions for engraving.

In arranging the details of the locks and fastenings of the various departments in an asylum, it must be borne in mind that, firstly, the patient must be prevented from escaping from his ward or from the asylum; secondly, he must not be able to lock or bolt himself into any room, or to prevent the approach of his attendant; thirdly, he must not be able to bolt or lock in his attendant, should the latter inadvertently give

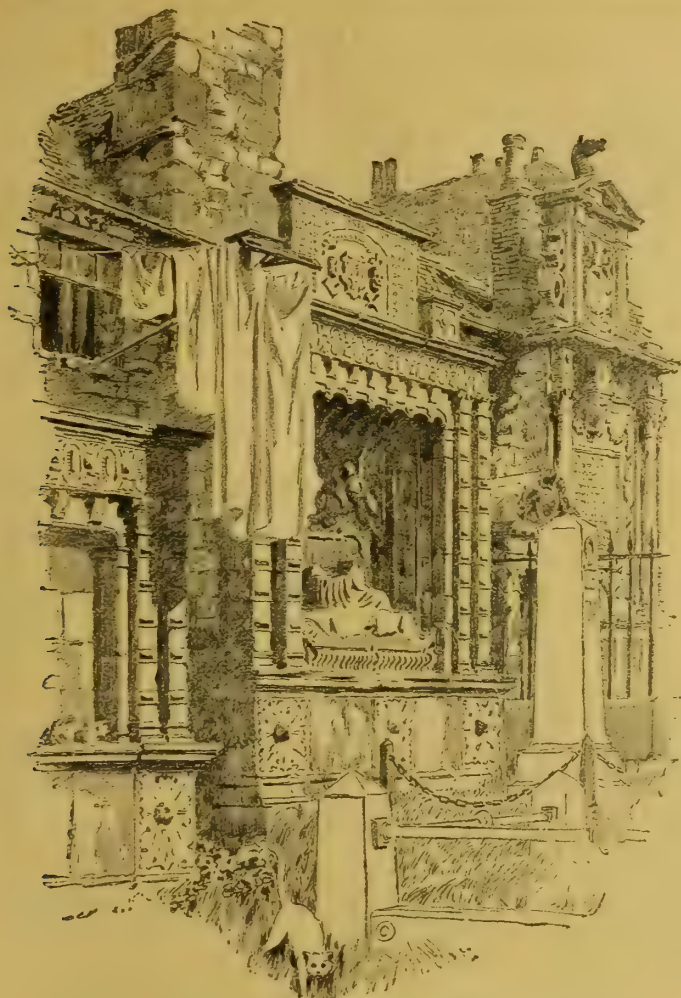
him the opportunity; fourthly, the wards for from the other; fifthly, the quarters for the male and female attendants should be similarly separated; sixthly, the chief officers only should have master-keys of the whole institution.

The silent indicating locks to which I have above referred have been adopted at the Cane Hill Asylum, also at the Surrey County Asylum, Brookwood; the Middlesex County Asylum, Wandsworth; Nottingham Borough Asylum; Warwick County Asylum; Cheshire County Asylum, Parkside; the Northumberland County Asylum at Morpeth, and elsewhere; and the great advantage, in addition to that of indicating and silent acting, is the facility for opening doors rapidly in the event of fire.

Nearly the whole of the locks and bolts fitted in British asylums during recent years have been manufactured by three or four firms of English locksmiths who have studied the special requirements for asylum work. To those who have not devoted some attention to the subject, it may frequently have been surprising to reflect that a key to lift seven levers may be altered to suit no less than 5,040 locks, if the bits be of seven different lengths, and that the total number of changes would be further increased if two or more of the bits were made (in alternations) of corresponding lengths, while the addition of only one bit would increase the number of changes of the key to suit no less than 40,320 locks.

Keys have been constructed with movable bits intended to be fixed in any desired order by means of a screw. The arrangement of the locks for which such keys are intended is very ingenious, for the levers will adjust themselves to any arrangement of the movable bits when locking them, but no other arrangement than that special one with which they were locked would unlock them. Keys of this description would be useful in connection with certain asylum wards where it may be occasionally desired (for variations of sub-classification and discipline) to limit or extend the range of apartments over which any attendant or set of attendants may have control, a second set





TOMBS IN GREYFRIARS, EDINBURGH.

of keys or a simple alteration of the bits in the male and female patients must be locked off one key effecting all that would be necessary, thus avoiding the alteration or removal of locks and the resulting damage to doors.

(To be continued.)

#### EDINBURGH.\*

MANY will welcome this really beautiful edition with its illustrations by Mr. T. Hamilton Crawford. The plates are excellent, and the line illustrations equally so. We give two of the latter, by the courtesy of Messrs. Seeley and Co.—one of the well-known “Greyfriars” with its tombs, and the other of the Chapel Royal.

For a Scotsman, Stevenson was candid enough about the drawbacks of the Scottish capital. Its climate, he declared truthfully enough, is such “that there could scarcely be found a more unhomey or harassing place of residence.” People like Edinburgh, much as a virtuoso dotes upon his cabinet, and probably for what she least prides herself on. Stevenson, truly enough, says that “She is pre-eminently Gothic, and all the more so since she has set herself off with some Greek airs, and erected Classic temples on her crags.” Edinburgh is, above all things, a curiosity. Neither capital nor county town, she recalls everywhere the memories of the past, and if she found in Robert Louis Stevenson a less blind admirer than some of his countrymen, he, at any rate, was a discriminating one.

It is no disparagement to the memory of the great novelist to say that the architect and artist will find at least as much that is attractive in Mr. Crawford’s illustrations as in the text. There are eight plates, and fifty-four engravings. Nothing of importance is missed, and a better illustrated record of the beauties of “Auld Reekie” we have yet to make acquaintance with, or one so creditable as regards its production, to the publishers.

\* Edinburgh: Picturesque Notes. By ROBERT LOUIS STEVENSON. London: Seeley and Co., Limited. 19s.

#### LONDON CHURCHES OF THE XVII. AND XVIII. CENTURIES.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

WITHOUT unduly reflecting upon the two or three (otherwise laudable) attempts which have hitherto been made to illustrate the historic churches of London in a minor book form, we may at once unreservedly remark that no previous compilation of the kind can in any way compare with the monumental and really beautiful work which has this week been issued to subscribers under the above title by Mr. B. T. Batsford, with descriptive notes by Mr. Geo. H. Birch, F.S.A., the Curator of the Sir John Soane Museum.\* No better authority on the history and archaeology of these buildings could have been chosen for the editorship of such an undertaking, and the subject is, perhaps, the one which Mr. Birch has for many years made distinctly his own, while the photographic views which give such value to the volume have all been specially taken by Mr. C. Latham. The great difficulty presented to the photographer in the City is, of course, the absence of light in most of these buildings, which are also always more or less bedimmed with fog, even on the clearest summer’s day, when the very sunshine serves to enhance the atmospheric hindrance by bringing the presence of the fog more distinctly into prominence, and thus obscuring the architectural detail in a very curious and tantalising way. We experienced this ourselves when photographing the City Halls, and can, therefore, well understand how very real the difficulties were with which the author of these exquisite prints had to contend. Neither expense nor trouble evidently was spared to secure the admirable results which we see before us, and no doubt not a few of the

\* London Churches of the XVIIth and XVIIIth Centuries. A selection of the most remarkable Ecclesiastical Buildings, including St. Paul’s Cathedral, erected within and around the ancient City Walls between the years 1659 and 1730, from the Designs of Inigo Jones, Sir Christopher Wren, Nicholas Hawksmoor, and James Gibbs. A series of 64 plates and numerous other illustrations, with historical and descriptive Notes. By GEORGE H. BIRCH, F.S.A. London: B. T. Batsford. 1896.

views must have been taken more than once to obtain such clearly defined interiors as these are. It is only fair that this factor should be named, as none but those who have an intimate personal acquaintance with these City churches would probably realise what we have pointed out; and to compare photographs taken abroad, or even in the country, with those of London buildings must always be entirely misleading.

With these preliminary remarks we turn with unqualified pleasure to Mr. Batsford’s latest addition to the really grand series of standard works on our national architecture, which his firm, with so much enterprise and judgment, are gradually originating. The inception of this book, in point of fact, is due to its sub-editor, Mr. Bradley Batsford.

The volume opens naturally enough with some illustrations of St. Paul’s Cathedral, and, of course, prominence inevitably is given to some of the most characteristic churches erected by Sir Christopher Wren; but works by Inigo Jones, Nicholas Hawksmoor, and James Gibbs are also included, as the volume forms a complete record of the churches erected in London and outside the limits of the city proper during the century commencing 1630 (in the reign of Charles I.), and includes those of Charles II., James II., William and Mary, Anne and George I. Besides the sixty-four full-page colotype plates, there are a large number of plans, details, and marginal sketches which materially add to the interest of the letterpress with which they are associated. The author opens his essay with a concise reference to the *tabula rasa* resulting from the great fire of 1666, which prepared the ground for new projects, such as might, it would be thought, have been carried out unfettered by the trammels of the past, and set free from the associations of that which had gone before; but these traditions proved too strong for even the most progressive of reformers, and so the new churches were erected on the old sites, in some cases on the old foundations, while the original names and arrangements of the streets survived. The thoroughfares were widened, and better materials were employed in the buildings; but in the main the lines of the new city arose from its ashes very much on the plan of the old. Wren departed from the ground plan and arrangement of the ancient churches in all instances where he could, and in his own particular way gave us many buildings which, as Mr. Birch rightly enough says, we may well be proud of. The structural chancel was, however, really rare in the Mediaeval churches of London, which were mostly rebuilt during the 15th century without a chancel arch, and later on the rood-screen had been removed in consequence of religious troubles. Most of the towers were low, and All Hallows Barking, St. Andrew Undershaft, and St. Mary Aldermay (rebuilt by Wren in the ancient form), St. Giles Cripplegate, St. Olave, Hart-street, and St. Peter’s in the Tower, show us exactly what they were like. They were essentially English, these 113 City churches, besides the cathedral, and although the buildings of the Renaissance compare in no way with them, they, too, are English, and, in some particulars, are not so entirely unlike the Gothic churches whose places they occupy in their roominess and sense of space internally. Classic details invest the earliest of these new buildings, though the forms are in some degree Gothic, and Inigo Jones, who we know designed the chapel in Lincoln’s Inn, was probably the author of some of them. William Laud had revived many old customs and ceremonies which the statecraft of Elizabeth and the apathy of James had allowed to fall into desuetude, and in the same way the churches then built, in some cases at any rate so far as the plans were concerned, followed the type of the old models. Instances are quoted by Mr. Birch, who, as an enthusiastic Churchman, admirably refers to the archbishop’s endeavour to stem the torrent of Puritanism then rising and thus lead men to rightly value their inheritance in the Church of England. As to the history of St. Paul’s and the work which Inigo Jones did for Charles II. we need not refer; neither need we do more than commend to our readers the author’s *résumé* of the rebuilding of the Cathedral by “Dr. Christopher Wren,” which followed the Great Fire, and his admirable account of the reconstruction of the several churches which succeeded that event. The first to be rebuilt was St. Mary-le-Bow, Cheapside, and much of its cost was paid by private subscriptions. St. Stephen’s, Walbrook—Wren’s masterpiece—followed in 1672, and St. Michael’s,



Cornhill, and St. Mary-at-Hill were built in the same year. St. Olave, Old Jewry, St. Benet Fink, St. Dionis Backchurch, St. George Botolph, and St. Michael, Wood-street, were finished in 1675; then St. Magnus, London Bridge, St. James, Garlick Hythe, St. Mildred, Poultry, and St. Stephen, Coleman-street; in 1677 St. Lawrence Jewry, St. Nicholas Cole Abbey, St. Mary, Aldermanbury, and St. Michael, Queenhythe. Soon after these were in hand, Nicholas Hawksmoor was articulated to Wren, so that he was associated with his master in many of his most important works. We mention this here as we have chosen Christ Church, Spitalfields (1715), one of Hawksmoor's finest works as our example from the book under notice.

In looking through the plates we cannot speak too highly of the frontispiece showing a grand view of St. Paul's Cathedral from the tower of St. Martin's Church, Ludgate. It is so entirely fresh to the ordinary student that it cannot fail to be welcomed, though Plate II. gives the west front of the cathedral more in its correct proportion as seen from over the statue of Queen Anne at the top of Ludgate-hill. There are several plates well occupied by views in detail, and the interiors are beyond all praise, particularly those of the south aisle (7) and north-west chapel (8). The organ-case and stalls will be welcomed for the beautifully clear way in which the woodwork is shown, and the metal-work is capitally defined. As a photograph that of the Bishop's Throne (XII.) is remarkably fine, even the grain of the oak coming out as in nature.

The churches are considered in chronological order, St. Catherine Cree coming first, and plans in all cases add to the value of the book. The large plan of St. Paul's is shown to a scale of 50ft. to the inch, and all other church plans, except the few with scales attached, are drawn to a uniform scale of 32ft. to the inch, thus affording a ready means of comparing the relative sizes of these buildings. The interior of St. Catherine Cree is one of the best collotypes in the book, every detail being as well defined as possible, the design of the stained glass, for instance, permitting the most minute examination. St. Paul's Covent Garden, St. Mary-le-Bow steeple, the tower of St. Stephen's, Walbrook follow, and an exquisite interior of the same church as we now see it, after the refined renovations and additions by Mr. F. C. Penrose, F.R.S. The pulpit is done justice to in Plate XVIII., and the font on the following page. St. Mary-at-Hill comes next, and then St. Magnus steeple, London Bridge, followed by St. James, Garlick Hythe, with St. Paul's in the middle distance. The organ-case of St. Lawrence Jewry, and the parlour or vestry of the same church, which are really from the hand of Grinling Gibbons, are equal to anything at Hampton Court or Windsor Castle. St. Bride's, Fleet-street, is so hemmed in by houses that a good exterior seems impossible, but the steeple figures well from the S.E. An interior, too, is given. St. Clement Danes makes one of the best pictures in the book, with the Courts of Justice seen over the roofs. The steeple of the church, from this point of view, is shown to the greatest advantage. St. Peter's, Cornhill, and All Hallows, Thames-street, have screens of much interest, and the altar at St. James's, Piccadilly, will doubtless find admirers. The font may have been often shown; but we regret its absence from this volume exceedingly. The pulpit from St. Mildred, Bread-street, is spiritedly drawn, and the view of St. Martin's, Ludgate, figures well in Plate XLI. as a foil to the cathedral. The relative scale of Mr. Colcutt's insurance office facing the church comes out in this picture. Passing rapidly St. Mary Abchurch, and St. Andrew's, Holborn, next which the City Temple reminds one of Landseer's picture, "Dignity and Impudence," we reach Christ Church, Newgate, from which building Mr. Batsford has given us two capital pictures. In St. Margaret's, Lothbury, is the great pulpit and screen from All Hallows the Great, and the visitor to the City will do well to look into this church near the Bank and see what improvements Messrs. Bodley and Garner are making there. All Hallows, Lombard-street, also has a rich altar-piece and pulpit of good outline. St. Vedast Foster, with Bow steeple behind, makes an uncommonly interesting view, taken, we presume, from the Post-office and St. Mary Aldemary, with its fan vaulting, is from the hand of Wren, although it is so unlike anything else he ever did in the City. St.

Martin-in-the-Fields brings us down to 1722, when Jas. Gibbs commenced this familiar church, which cost £37,000. The interior is no doubt very fine, but it lacks the dignity of the masterpiece of Wren. St. Mary-le-Strand is done justice to, though the picture is somewhat lacking in brightness. Gibbs estimated its cost at £9,000, but it cost £16,341 1s. 2d. Christ Church, Spitalfields, both for its plan and its architecture, is unique. It is unlike anything of Wren's, although, from Hawksmoor's association with him, one would have looked for some similarity, such as exists between master and pupil. The chief peculiarity in the plan is the amount of space devoted to lobbies, staircases, and vestries, and the unusual distribution of the columns, for although possessing nave and aisles, the colonnades dividing these are not treated continuously, either as regards the shape of the columns or the spaces, both the east and west bays being much the narrower. Two piers are introduced on each side to vary the monotony of the single columns. These piers have pilasters attached to the north and south sides, their use not being very apparent, as they carry nothing beyond a smaller pilaster on the side of the nave; this runs up to the flat ceiling, which, owing to the arrangement of the panels, needs no support. The columns are of the Composite order on high bases, as in St. James's, Piccadilly. The most extraordinary departure from precedent consists in the continuing the colonnade across the west and east ends, that at the west end being broken in the centre by the introduction of the organ, as seen in our double-page plate. At the east end the entablature is carried across, and this screen of columns produces an effect which Mr. Birch describes as "scenic." This church cost nearly £20,000. The galleries, much to the advantage of the church, have been removed, the late Mr. Ewan Christian having much altered the building. St. George's, Bloomsbury, All Hallows Barking, and St. Leonard's, Shoreditch, complete the series. The volume is of the highest merit, and does every credit to all concerned in its production as a valuable classic of permanent value and interest for the architect's library.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXI.

By JOSEPH HORNER.

**B**UILDERS' ironwork is obtained in three ways: First, castings which are kept in stock, or the patterns for which are kept in stock by ironfounders are purchased. These can only be purchased when they are of a standard character, or of kinds for which there is a large demand. Second, the order is given to an ironfounder, or engineer, who, employing pattern-makers, constructs the pattern-work. Third, the pattern-work is done by the builder himself, who then, taking his pattern to a jobbing foundry, obtains the casting or castings.

When ordering castings without sending patterns, it is necessary to be very precise in giving detailed information. If there is any point left open to doubt, the wrong way is generally followed. It is not necessary to make finished drawings, shaded or coloured. A good hand-sketched is just as serviceable as a drawing. The point is to omit nothing in the way of information as to forms or dimensions, and to leave no two readings of any view possible. More than this, it is often advisable not to trust wholly to drawings or sketches, but to supplement them with templets. In some cases the latter may be made to furnish complete information, so that sketches are not required at all. More than that, a templet sometimes furnishes the only available method of obtaining the exact form and dimensions requisite, measurement by the rule being difficult and uncertain. A templet will sometimes also convey a better idea of the proportions of a casting to the mind of a man unaccustomed to judge of proportions by drawings than a drawing would do. Castings look more massive and solid than their patterns. Lastly, in a few cases the templet is all, or nearly all, which the moulder requires in order to make a casting. It is so in the case of work which is struck or strickled up. I will give some illustrations of these in due course. But first it will be desirable to lay down in a concise manner the leading principles which must be observed in the construction of that class of pattern-work with which builders and contractors would be specially

interested. Builders and contractors who employ carpenters and joiners do not like to incur the cost of pattern-making, when, in the case of one or two castings only being wanted, the cost of the pattern will often equal that of the castings. Pattern-makers' wages are high, and engineers' profits are heavy, and so the cost of pattern-making soon runs up. To those outside the trade there are, of course, many little wrinkles which are not obvious until explained. Perhaps I may profitably devote three or four articles in this series to the illustration of these points, and so put the builder's carpenter and joiner in the way of making plain patterns, which will mould when sent to the foundry, instead of being returned for alteration.

There is an advantage in constructing one's

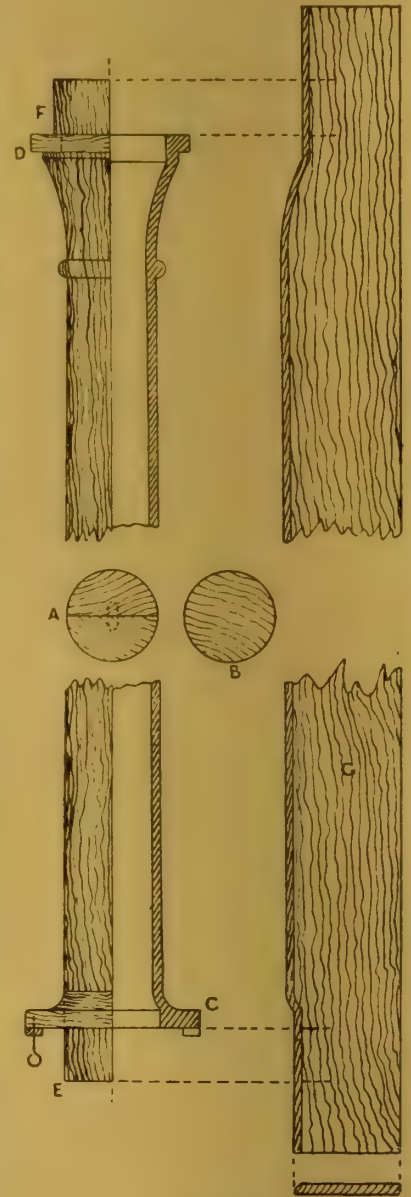


FIG. 64.

own patterns, besides the saving in cost: the builder is often able to show the patterns in the place which the castings have to occupy, and alter or modify them to insure good fitting, or to suit his tastes or those of his customers. This is more satisfactory than ordering patterns out. It may be adopted also in a very large proportion of builder's plain work, being injudicious chiefly in the case of work, the patterns or castings of which are kept in stock by ironfounders. The risk is that patterns may be so made as to be ill-adapted for moulding from, in which case extra time is charged for alterations in the foundry, or else indifferent castings may be turned out. There is a good deal of cast work, especially that of a highly ornamental type, the patterns for which can only be constructed by expert craftsmen. But there is also a large number of plain castings, the patterns for which offer no special



difficulty in construction. Such work, e.g., as stanchions, girders, and especially plain columns, and roof-shoes, brackets, &c., are largely used by builders and contractors. Illustrations, therefore, of these should prove of service.

No plain columns, or columns with turned mouldings, offer much special difficulty in the construction of the patterns, or in the making of the moulds. All plain-turned mouldings are easily formed. It is in the case of carved work, both on mouldings and on capitals, that difficulty in the parting of patterns and moulds arises. I have made a goodly number of columns of both classes in my time, some of which I will illustrate.

Fig. 64 is a type of column very largely used in workshops, houses of business, warehouses, &c., for supporting the main beams of floors. It is made in sizes ranging from about 2½ in. or 3 in. diameter up to 8 in. or 9 in. Patterns of these are kept in stock by many ironfounders, and castings of any required length made therefrom—say, from 6 ft. to 8 ft. in the smaller, to 10 ft., 14 ft., or 16 ft. in the medium, and larger sizes. They taper about 1 in. in a length of 10 ft. or 12 ft. without entasis. The capital, which is plain, is usually untouched—that is, it remains intact for any casting, and the length of the casting is altered by adjustment of the position of the bottom flange. But always at a slight extra charge both base and cap can be altered to any shapes and dimensions, the shaft always remaining unaltered.

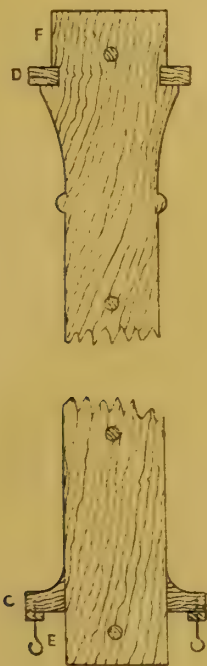


Fig. 65.

The pattern of this type of column can be readily constructed by any average carpenter and turner. The half-section of the casting is seen to the right, an outside view of the pattern to the left. A section through the body of the pattern is shown at A, or alternatively at B, the difference in which will be noted presently; and the core board is seen at G. Fig. 65 illustrates the top and bottom portions of the pattern open in the joint face, the better to show the method of fitting the flanged parts to the main body of the pattern. The bottom flange C is simply bored to fit the body to the pattern, not so good a way as the recessing of the top flange D. The prints E and F correspond in diameter with the diameter of the holes at the ends of the casting. By comparing the chamfered profile or working edge of the board G (Fig. 64) with the profile shape of the interior of the column casting its coincidence therewith is at once apparent. A pattern and board made like Fig. 64 will be all the moulder requires from which to produce a suitable casting.

Figs. 66 and 67 illustrate a very convenient method of constructing plain column patterns in a shop, or for a job where large numbers are required of the same diameter and type, but of different lengths, and with differences in flanges. The pattern is parallel throughout, and many columns for indoor work are so made. Fig. 66 shows the half-section of the casting on the right

hand, and a half-plan of the pattern on the left. Fig. 67 shows the half-pattern open in the joint face. It is seen that the flanges, and bell, and mouldings are fitted on the body—not let into recesses, and therefore these parts can be slid along and screwed in any position as often as required, and such alterations can be effected in a few minutes. Not only so, but alterations in the shapes of flanges are easily made. The base flange, or the "plinth," can be made smaller, or broader, and the flange on the capital, or "abacus," can be made to suit timber or iron joists, with or without joggles or bolt-holes. It is simply a matter of unscrewing and screwing on. The bell also can be omitted and the

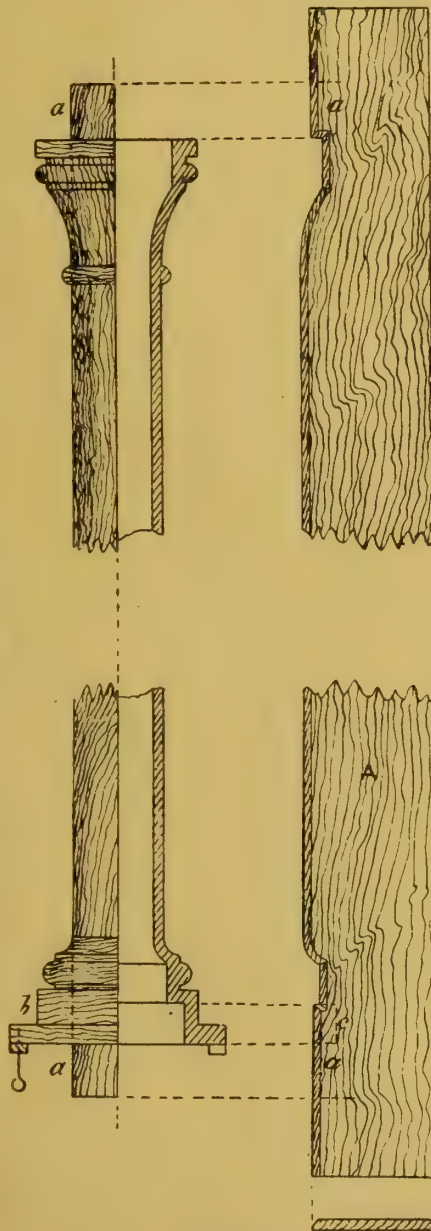


Fig. 66.

moulded base, and bracketed flanges can be used instead.

In such a pattern the portions which project beyond the length of the pattern and casting required serve for prints. True, they are of the same diameter as the pattern body, and we saw in Figs. 64 and 65 that the prints in that example corresponded in diameter with the diameter of the core at the ends of the casting. But this is a matter of no consequence. A frequent practice when there is a lack of coincidence between these diameters is to use "stopping off-pieces," by means of which the shape of the print portion of the mould is altered to produce the required correspondence. But that is not necessary. If the core-board is made like A in Fig. 66, to coincide at a, a with the diameter of the prints a, a in Figs. 66 and 67, and cut back to the diameter of the core within the required casting, that will do equally well with stopping off.

At b in Figs. 66 and 67 a portion of the base

is shown square. If the column is of small diameter, the hole may be round. But for reasons explained in previous articles it is not desirable to allow the massing of much excess of metal anywhere. For large columns, the core, therefore,

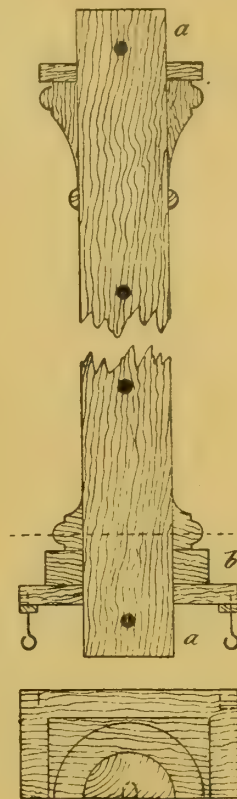


Fig. 67.

should be square in this locality. The position of such a square core is indicated at c on the board. It is made in a core-box, Fig. 68, and a central hole is cored through it with the print A, so that it shall slide over the end of the core struck by the edge a, of the board, to correspond with the diameter of the print a, at the bottom end of the column.

It is a general rule that patterns of this kind shall be jointed and doweled down the central plane, to correspond with the moulder's joint between the top and bottom flasks. There are two exceptions: it is not necessary to joint small columns, and columns made from loam patterns cannot be jointed. A plain column, like Figs. 64 and 67, ranging from, say, 2½ in. or 3 in. up to 6 in. diameter, need not be jointed, but turned solid like B in Fig. 64. I have seen many scores of good moulds made from such patterns without the

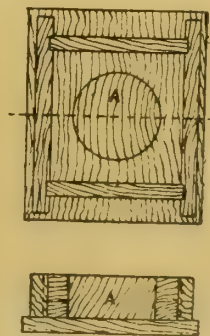


Fig. 68.

patterns being jointed. Being of small diameter, they are more likely to remain straight when solid than when jointed, because they are symmetrical, and therefore less liable to warp than two half-cylinders. The edges of the mould generally fracture a little in the top, but the pattern is just put back there, and the broken edges made good with the trowel. But columns over about 6 in. diameter, of whatever shape, are generally jointed, as at A, in Fig. 64. And then, when over 8 in. or 9 in. diameter, they ought not



to be jointed in solid stuff, but "lagged up." Of course, for two or three casts solid stuff will answer; but if a good many, say a dozen or more were required, a "lagged-up" pattern should be



FIG. 69.



FIG. 70.

made. Patterns made in solid stuff and jointed go out of truth lengthwise and warp in section (Fig. 69, or Fig. 70, exaggerated).

## DESIGNING OF STEEL BRIDGES, THEORETICAL AND PRACTICAL. —XXVIII.

IN order to ascertain the separate stresses upon the individual members of the truss represented in Fig. 1, recourse can be had to the graphic method previously referred to, and a diagram constructed on the principle of the polygon of forces, shown in Fig. 2. The first step in the process is to determine the manner in which the load is distributed over the lower flange of the truss. Until this point is settled, it is impossible to accurately plot the "load line" of the stress diagram, which is represented in Fig. 2 by the divided line A B. The sub-divisions of this line are thus obtained. Since the total load is supposed to be uniformly distributed over the whole girder, let it be put equal to  $W$ . Make  $N$  = the number of panel lengths, and  $W_1$  the load supported by each panel. Also let  $R$  and  $R_1$  be the reactions at each point of support or abutment. Then in this instance we have—

$$R = R_1 = \frac{W}{2}.$$

But from the calculations already arrived at,  $W$ , for one of the main girders, was estimated to be equal to 230 tons, so the equation becomes—

$$R = R_1 = \frac{230}{2} = 115 \text{ tons.}$$

Make the line A B in Fig. 2 upon any convenient scale equal to 230 tons, and bisect it in the point 16; the lines 16—A and 16—B will equal  $R$  and  $R_1$  respectively, and be each equal to 115 tons. On referring to the skeleton elevation of the truss in Fig. 1, it will be seen that, including the points of supports A and B, which answer to the corresponding letters in the load line A—B in Fig. 2, there are altogether 15 points of supports in the whole span of the truss. But there is a difference between the amounts of the load carried respectively at the apices or panel points of the truss and at the points of support A and B. While each separate panel point 2—14 carries the share of the load due to the length of a full panel, the points of support A and B carry only half that load. Using the same notation, we find the share of the load carried at each point of support equal to

$$\frac{L}{2 \times N} = \frac{230}{14 \times 2} = 8.214 \text{ tons,}$$

and the load carried at each panel point will be equal to twice this amount, or 16.428 tons. We may now proceed to lay off the subdivisions of the load line A—B in Fig. 2. Upon the same scale as already employed, plot off A—1 equal to 8.214 tons. From the point 1 plot off 1—2, 2—3, 3—4 . . . 13—14, each subdivision being equal to 16.428 tons, or double that of the division A—1. If this plotting be accurately effected, the remaining line 14—B will be equal to A—1. From the point 16 in Fig. 2 draw a line of indefinite length at right angles to A B. This line represents the line of stress for the upper horizontal flange of the truss 16—16 in Fig. 1, and its separate divisions will give the corresponding stresses upon the different members of the flange. It has been laid down as an axiom belonging to reciprocal diagrams of forces, that those parts of a frame or truss which inclose a space in the elevation must meet at a point in the diagram, and that those which meet in a point in the elevation must inclose a space in the diagram of forces. It should be noted that this reciprocity constitutes an excellent, as well as a very elegant, check upon the accuracy of the graphic method of analysis.

FIG. 1.

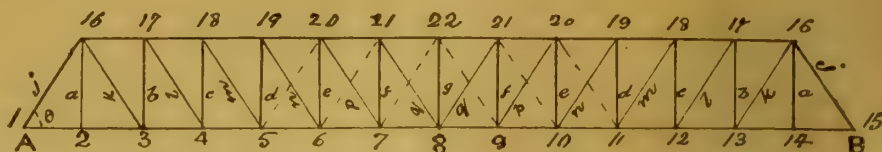


FIG. 2.

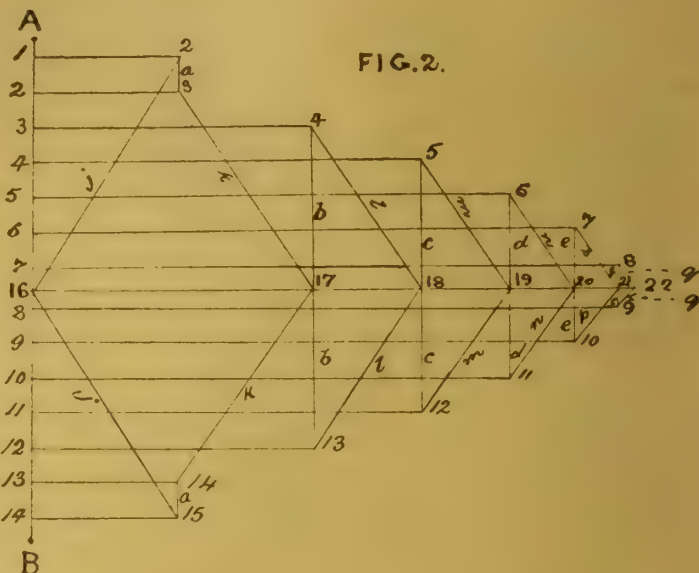


FIG. 3.



From the points 1, 2, 3, . . . 14 in Fig. 2 draw lines of indefinite but of convenient length, parallel to the line already drawn from the point 16 in the centre of the load line A—B. Draw the line 16—2, in Fig. 2, parallel to A—16, in Fig. 1, the line 2—3 parallel to 16—2 to meet 2—3 in the point 3 in Fig. 2, and the length of the lines in Fig. 2 will give the amount of the stresses on the members of the truss parallel to them, and distinguished by the same letters and symbols,  $j$ ,  $a$ , 1—2, 2—3 in both figures.

To check the accuracy of the reciprocal diagram, for which purpose one or two examples will be sufficient, we may take the first triangle in the elevation of the truss in Fig. 1, formed by the parts  $j$ ,  $a$ , and 1—2, which inclose a space, or, as it is frequently termed, form a closed figure. These bars or members should meet at a point in the reciprocal diagram in Fig. 2. They do so meet in the point 2. From the point 3 in Fig. 2 draw 3—17 parallel to  $k$  in Fig. 1, and from 17 draw 17—4 parallel to 3—17 in Fig. 1, to meet 3—4 in point 4. The length of the respective lines in the diagram will give the stresses in the parts of the truss  $k$ ,  $b$ , and 3—4. It will not be necessary to describe further in detail the construction of the remainder of the diagram. A repetition of the process commencing at the point 4 will complete it, as shown in Fig. 2. There are some features, nevertheless, in it which require comment and special description and illustration. In the first place, it should be noticed that the stresses on the two members of the lower flange—1—2 and 2—3—are equal, which proves that no additional stress is brought upon the bar  $a$  by the action of the load at the point 3. Having disposed of the stresses upon the terminal members of the lower flange of the truss, it will be evident that the stresses upon the remaining parts or panel sub-divisions of both the upper and lower flanges will be equal to one another taken consecutively.

Thus the lines 3—4, 4—5, . . . 7—8 in Fig. 2 are equal respectively to the lines 16—17, 16—18 . . . 16—21 in the same diagram. We may now tabulate the stresses upon the different members of the truss in which those in compression are distinguished by the sign plus, and those in tension by the sign minus. It will be necessary to tabulate the stresses upon only one-half of the truss, since the load is uniformly distributed and symmetrical. These are shown in tables 1 and 2, in which the parts of the truss are taken from Fig. 1, and the stresses from the lengths of the

lines correspondingly marked in Fig. 2. It will be advisable to check by calculation the stresses upon one of the members of one of the flanges, and upon one of the struts or ties in the web. Let that part of the lower flange 5—6 and the member  $d$  of the web be selected from the elevation of the truss in Fig. 1. Making  $S$  = the stress upon the part 5—6, we have—

$$S = \frac{W \times a \times b}{2 \times D \times L}$$

Since in the method of loading adopted the load upon the two points of support has been taken equal to that upon one panel, the value of  $W$  is in this instance equal to

$$W = 16.428 \times 2 = 32.856.$$

By measurement to scale of the position of the part 5—6 in Fig. 1, the segments of the span into which it is divided become equal to—

$$a = 28. \quad b = 72.$$

So that the equation becomes—

$$S = \frac{213.572 \times 28 \times 72}{2 \times 10 \times 100}$$

Cancelling and reducing, we obtain—

$$S = 0.2135 \times 14 \times 72$$

from which  $S = 215.2$  tons.

The stress on the bar  $d$  is simply a shearing stress, which has been demonstrated in previous articles under the existing conditions of loading to be equal to the sum of the weights or panel-loads lying between it and the centre of the truss. Each panel-load is equal to 16.428 tons, and there are three of these loads at the panel points 8, 7, 6 in Fig. 1. But of these loads only half of that at the apex 8 affects the vertical  $d$ , the other half being transmitted to the other support, B, through its own system of verticals and diagonals. The stress upon the vertical bar  $d$  consequently equals—

$$\frac{16.428 \times 5}{2} = 41.1 \text{ tons.}$$

Again, a last check may be made with one of the diagonal bars  $K$ , for example, when the stress upon it will be given by the equation  $S_1$ —

$$S_1 = \frac{16.428 \times 11 \times \csc \theta}{2} = 111 \text{ tons.}$$

Allowing for the slight difference that must always exist between two independent methods of calculation, these results will be found to agree with each other sufficiently closely for all practical



purposes. The student and beginner is advised to draw the skeleton elevation of the truss and the diagram of forces to a much larger scale than our space will permit of, and the degree of *rapprochement* between the two methods will become still more accentuated.

TABLE I.

Upper Flange.		Lower Flange.	
Part of truss	Stress in tons.	Part of truss	Stress in tons.
16-17	+ 128	1-2	- 67
17-18	+ 176	2-3	- 67
18-19	+ 217	3-4	- 128
19-20	+ 246	4-5	- 176
20-21	+ 266	5-6	- 217
21-22	+ 272	6-7	- 246
		7-8	- 266

TABLE II.—WEB.

Vertical bars Stress in tons.		Diagonal bars. Stress in tons.	
a	- 16	Sloping end j	+ 126
b	+ 74	k	- 113
c	+ 60	l	- 93
d	+ 43	m	- 72
e	+ 28	n	- 52
f	+ 9	p	- 33
g	0	q	- 12

In proportioning the dimensions of the respective bars of the web in compression, or the vertical struts, the thickness of the channel-irons composing them, as represented in our last article, must not be reduced below a minimum of  $\frac{3}{8}$  in. Any further reduction in the net sectional area required may be made by a slight decrease in the dimensions of the channel-irons themselves. The number and variety of sections of both steel and iron, of all descriptions of form and size, manufactured by iron firms of repute, afford a selection which renders it a simple task for the designer to choose those which are the best suited to his purpose. Referring now to the proportions necessary for the tie-bars, the maximum stress is found to come upon the diagonal, K, and to be equal to—113 tons,

which will require a net sectional area of  $\frac{113}{6.5}$ , or, 17.5 sq. in. But in order to allow for rivet area, it will be advisable to make the gross sectional area equal to 20 in. This amount of material can be obtained by employing two flat bars, each 12 in. by  $\frac{5}{8}$  in., and diminishing the width and thickness proportionally to adapt them to the smaller stresses on their fellow tie-bars. It will not be necessary to brace these diagonal bars together, as is done with the struts, as the character of the stresses upon them tends to keep them taut. Too much reliance, however, must not be placed upon this circumstance, as is abundantly manifest by the bulging which has taken place in the flat tie-bars of the girders of the Charing Cross Bridge. The diagonal bars of the truss are shown in elevations in Fig. 3, where they are bolted together at intervals by bolts  $\frac{1}{2}$  in. diameter.

Before proceeding to the subjects of the cross-girders and the details of the platform and permanent way, the position of the counterbraces and the necessity for them must be ascertained. In the elevation of the truss in Fig. 1, the counterbraces are shown by the dotted lines, and it remains to determine whether more of them are required—that is, whether the system of counterbracing should be extended to some of the panels nearer the abutments, and what the different stresses upon them are. It will be as well to enunciate first the general axioms which govern the principles of counterbracing. 1. Counterbracing is not required in the flanges or booms of girders and trusses, since the maximum stresses upon their separate parts occur when the dead and live or moving load are uniformly distributed over the whole span. It is evident that it is necessary to regard the live load in the light of a uniformly distributed one, because a train equal to or exceeding in length the span of the bridge might at any time be brought to rest upon it. Indeed, such instances are common where bridges are near stations, or, as frequently happens, where stations are actually built on bridges over roads and public thoroughfares. It may be mentioned that no counterbracing would be needed even if the train did not cover the whole span, provided the centre of gravity of the train coincided with that of the bridge; but this especial case calls for no particular consideration, as the practical value of it is nil. 2. Under no possible method of loading can a main brace or a counterbrace in any panel

length of a truss be both subjected to stresses at the same time. 3. If the span of the truss be divided into two unequal segments, the maximum stress upon any member of the web will occur when the live load covers the longer segment. If the member be a strut, the greatest tensile stress will be brought upon it when the moving load covers the shorter segment. If the member be a tie, the same rule holds, provided the character or sense of the stress be changed from minus to plus. As a general rule, whether the part stressed be a strut or a tie, the maximum "reversal" takes place when the moving load covers the shorter segment. There is one exception to this rule. It is in the case of the central bars, whether diagonal or vertical, and the manner in which they are affected will depend upon the position of the load, whether it be on the upper or lower boom. A distinction must be made between counterbracing in the sense it has been just regarded, and counterbracing or simple bracing introduced, not for the purpose of acting as a main brace under certain conditions of loading, but for imparting lateral and longitudinal rigidity to the whole structure. An instance of the latter description of bracing is furnished by "sway bracing," which usually consists of horizontal diagonal members, added to a bridge to enable it to resist the deformation to which it is liable from the force of the wind or any kind of impact. The principal trusses of a bridge are also, according to the type of design, frequently braced together by diagonal rods and bars situated in a vertical plane.

## NOTES ON DOMESTIC DRAINAGE.—X.

## SURFACE GULLIES.

BEFORE selecting a surface gully for any particular situation, it is necessary to know the nature of the waste liquids that will usually be discharged into it, so that an efficient gully may be provided for each particular situation. A gully that would be suitable to receive the

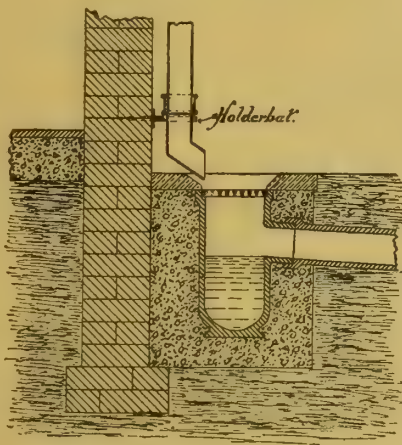


Fig. 46.

waste water from a roof or yard inclosure might be found ill-adapted to receive the various greasy liquids from a scullery sink. All gullies receiving storm-water only should be *trapless*. For this purpose, a trapless gully, as shown in Fig. 46, may be used. Any dirt, sand, or other *débris* from the roof is retained by the gully, and may be periodically removed, instead of being allowed to enter the drain. Similar trapless gullies may also be obtained fitted with a small silt-bucket, for the easier removal of *débris*. A rainwater-shoe, as Fig. 47, may be used in the place of a trapless gully, if preferred. It must be distinctly understood that *trapless* gullies or rainwater-shoes can only be used in situations where the storm-water drains have been properly disconnected from the foul-drainage section, as already described.

All surface gullies directly connected with the foul-drainage system must be securely *trapped*. The gully-trap should be thoroughly self-cleansing, and possess a good deep water seal, so as not to become easily untrapped by evaporation. When the branch drain from a trapped gully is not connected to the main drain in an inspection chamber, it is desirable to provide a ready means of access to the branch at some point near the

gully. This is sometimes done by fixing a junction near the gully-trap in such a manner that the arm is placed in a vertical plane with the drain so that it may be used as an inspection eye and cleansing arm if required. When not in use, the inspection eye is closed by means of an earthenware stopper, and afterwards covered with an iron or stone cover. A much more simple and satisfactory method to adopt in such circumstances is

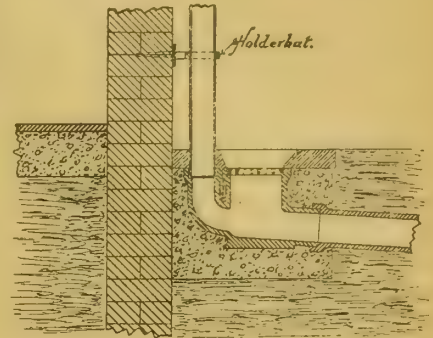


Fig. 47.

to provide a gully-trap with cleaning eye attached, as shown in Fig. 48.

For gully-traps receiving greasy liquids, such as those required for scullery sinks, &c., many different expedients have been tried—with more or less success—to overcome the difficulty experienced in dealing with the removal of greasy liquids in a simple and efficient manner. The particles of liquid grease, becoming chilled as they reach the gully, are congealed and deposited within and around the sides of the trap. Unless special precautions are taken, these solid particles of grease eventually enter the branch drain, where, being unaccompanied by a sufficient quantity and force of water to carry them direct into the sewer, they gradually accumulate on the sides until the drain becomes thickly furred, resulting eventually in a complete stoppage.

It will generally be found that the ordinary discharge from a scullery-sink waste is not sufficiently powerful to prevent the particles of grease being deposited on the sides of the drains and common form of trapped gully; but it is absolutely necessary to prevent such deposition, if the drains are to be kept in a permanently sanitary condition.

Until comparatively recently, it was usual to fix what is known as a "grease-trap" in all situations where liquids of a greasy nature might be expected. This consists essentially of a cast-iron or stoneware basin or receiver, so designed as to retain any fatty particles that may be discharged into it, whilst allowing the waste water—after being freed from grease—to enter the drain. The solidified grease must necessarily be removed by hand from the grease-receiver at stated intervals.

Fig. 49 shows a grease-trap of ordinary construction. The greasy water being discharged into the receiver is suddenly cooled by contact with the comparatively large volume of water retained there, and the now congealed particles of grease, being of light specific gravity, rise to the top of the water in the receiver and remain there until removed, the waste water flowing

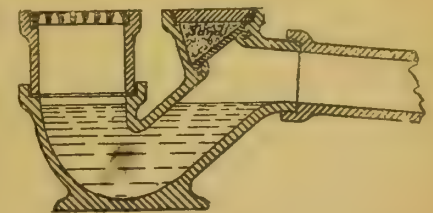


Fig. 49.

under the grease into the drain. Where the grease-receiver is fitted with an airtight cover, it is desirable that in all cases it should be thoroughly ventilated by means of a fresh-air inlet and a foul-air outlet. The foul-air extracting pipe should discharge into the air at some convenient point, where it would not prove obnoxious or injurious to health.

Grease-traps may be considered as insanitary



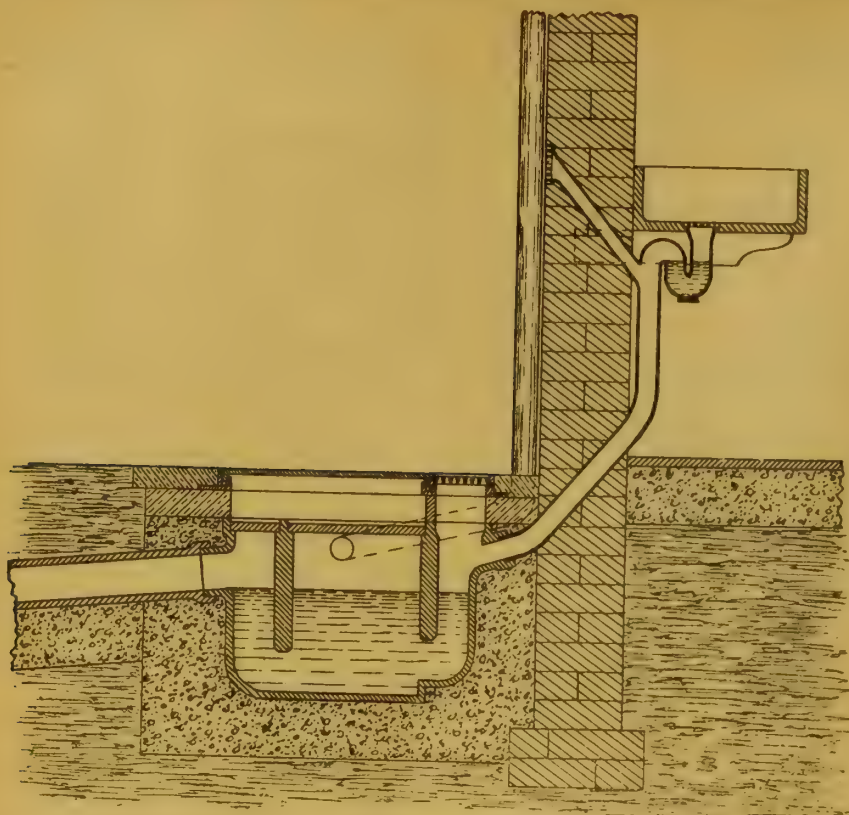


FIG. 49.

in principle, for the great aim of domestic sanitation should be the immediate removal of all impure matters from the house-drains. The necessity should not, therefore, arise for the collection of grease or any other description of sewage, which must be periodically removed by hand from the drains or traps in a more or less advanced state of decomposition.

Greasy liquids may be most satisfactorily dealt with if allowed to discharge into a properly-constructed flushing-rim grease-gully, provided with an automatic flushing cistern.

Fig. 50 shows a well-known form of flushing-rim grease-gully. This contains a sufficient volume of water to chill any grease that may

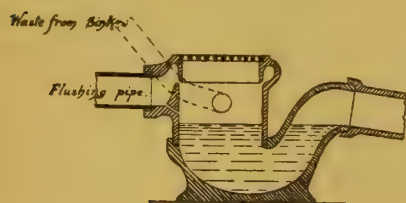


FIG. 50.

be discharged in solution from the sink, the congealed, fatty particles rising to the water surface in the gully. The flushing rim of the grease gully is connected with an automatic flushing-cistern, the water from which, being discharged with great force, breaks up the solidified grease within the gully; the particles are carried through the trap and entirely removed from the drain, whilst at the same time the gully and drain are thoroughly flushed and cleansed.

For ordinary purposes it will be found that a 30 or 40 gallon automatic flushing-tank discharging once a day is sufficient to cleanse the grease-gully and branch drain; but for hotels and other large establishments it will be necessary to flush the gully at least twice a day.

The waste from the sink may discharge over the grease-gully (as shown in dotted lines in Fig. 51) instead of below the flushing-rim if desired. The objection to such an arrangement is that the grating and portion of the gully above the flushing-rim are liable to be covered with a grease deposit, which, of course, cannot be removed by the periodical flush sent into the gully.

#### OBITUARY.

THE funeral of the late Mr. JAMES C. EDWARDS, the proprietor of the Ruabon Terracotta Works, whose death at the age of 67 years we announced last week (p. 488), took place at Llansilio Churchyard on the 31st ult. The cortege left Trevor Hall, Llangollen, in the following order:—The officials, clerks, draughtsmen, and employés at the Trefnant, Penybont, and Rhos works, in charge of Mr. H. H. Hunt, the tenantry, the clergy and magistrates, members of the Denbigh County Council, representatives of different companies, members of the Llangollen School Board and Urban and Rural District Councils, the general public, carriages containing friends and responsible officials, the body, the relatives, and a coach containing wreaths. The procession was four deep, and extended with traps and carriages for over a mile and a half. We are informed that the business, which has now been established for 37 years, will be carried on as usual, and under the old style of J. C. Edwards, by the two sons, the surviving partners, Mr. Edward Lloyd Edwards and Mr. James Coster Edwards. For a considerable time the late Mr. Edwards had practically retired from the management, leaving it entirely to his sons, who had been in partnership with him for several years.

MR. JOHN MIDDLEHURST, of Birchley Hall, near St. Helen's, died, after a protracted illness, on Sunday night. The deceased gentleman, who was eighty years of age, had been confined to his house for about twelve months. He was for many years in business in St. Helen's as a builder and contractor, and was the contractor for the erection of Holy Cross Roman Catholic Church, and other prominent buildings in St. Helen's and district. He formerly resided at Eccleston, but about five years ago he retired to Birchley Hall, which he purchased from Lord Gerard. He leaves three sons—Mr. William Middlehurst, of Bute House, St. Ann's; Mr. Thomas Middlehurst, of Peasley House, Peasley Cross; and Mr. Joseph Middlehurst, of Birchley.

The senate of the University of Glasgow have resolved to confer the honorary degree of Doctor of Laws, at the graduation ceremony on the 14th inst., on Walter De Gray Birch, F.S.A., assistant in the manuscripts department of the British Museum, and secretary of the Archaeological Association of Great Britain and Ireland, and William Turner Threlton Dyer, M.A., B.Sc., F.R.S., director of the Royal Botanical Gardens, Kew.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—Mr. Wm. Tom Connor, A.R.I.B.A., delivered his presidential address at the opening meeting of the ninth session on Tuesday evening, at 8 o'clock, in the Rooms, 187, Pitt-street. He touched on the progress made by the association during the past session. During that period the membership has increased from 94 to 162; but there was no reason why it should not still further increase. The subject of planning was the one chosen for the address. The requirements of a good plan are suitability and simplicity. Eccentricity and insane craving for effect should be avoided. The most successful building is that which combines fitness and beauty. The plan should never be sacrificed for elevational effect.

#### CHIPS.

Mevagissey enjoys the distinction of being the first town in Cornwall to make use of the electric light for the lighting of its streets. Previous to Wednesday week the inhabitants were solely dependent on the moon for the illumination of their thoroughfares at night. The installation has cost £1,500, and has been carried out by Messrs. Veale and Co., electrical engineers, of St. Austell, under the supervision of Mr. F. Hedley. Five miles of mains have been laid.

An inquiry was held at Morecambe on Wednesday week by Mr. Walton, M.I.C.E., Local Government Board Inspector, into an application by the Morecambe District Council for sanction to borrow £4,460 for work of private street-making, construction of projecting bay, with lavatories and shelters thereon, at the West-end, and the erection of a public mortuary in Clark-street.

Zion Chapel, Batley, was reopened last week after decoration in colour by Messrs. Tomlinson, of that town, from designs by Mr. E. Hoyle, of Bradford. Two stained-glass windows, new ventilators and heating apparatus, and mosaic paving for the porch are among the structural alterations carried out at the same time.

The Arts committee of the Liverpool Corporation have agreed to erect a statue to the memory of the late Mr. Philip Rathbone at the Walker Art Gallery, the cost to be defrayed by the proceeds of the last Autumn exhibition.

Memorial stones of a new Bible Christian chapel were laid at Ruan Major, Cornwall, last week. The style is Gothic, and the building will be faced with local stone and seated with pitch-pine pews. Mr. W. P. George, of Mullion, is the architect. Mr. R. Tiddy, of the Lizard, has taken the contract for masonry, and Mr. Cook, of Garras, that for carpentry.

The church of St. Saviour, Preston, was reopened on Sunday after having been internally decorated, both in chapel and nave, by Messrs. S. B. Wilding and Sons, Lune-street, Preston.

Mr. J. Evans, borough surveyor of Grantham, has been elected surveyor to the urban district council of Eastleigh, Hants, in succession to Mr. J. E. Batten, who has been appointed borough surveyor of Andover.

The first of newly-painted portraits added to the collection in the recently-opened National Portrait Gallery is that of Sir Richard Quain, president of the medical council, painted by Sir John Millais, P.R.A.

The Emperor William, the Empress, and the youthful Crown Prince will be present at the unveiling of the equestrian statue of the late Emperor William at Frankfort-on-the-Main next month on the 25th anniversary of the signing of the Treaty of Frankfort by Prince Bismarck and M. Jules Favre. The statue has been erected in front of the new Opera House.

The four-light east window of St. Nicholas' parish church, Sevenoaks, has been filled with stained glass as a memorial. The subjects are the Annunciation and the Visit of the Shepherds, while below are full-length figures of the prophets Isaiah, Jeremiah, Zachariah, and David. Mr. C. E. Kempe, of Nottingham-place, W., was the artist, and Mr. Arthur Whitehead, of Riverhead, near Sevenoaks, carried out the masonry work.

At Wrexham Police-court last week, Arthur Hulse, builder and contractor, Northgate-street, Chester, was fined 10s. and costs under the new Factory and Workshop Act for not reporting an accident which occurred on February 19th. Mr. John Hilditch, Inspector of Works and Factories, said on January 16th he visited the works Mr. Hulse was building in Regent-street. He saw the manager, and told him the Act had been extended to accidents at buildings in course of construction. A man was injured, and he was away for more than three days, but defendant did not report it.



## CONTENTS.

"When Daffodils Begin to Peer." .....	515
Utilitarian Buildings .....	516
The New English Art Club .....	517
County Lunatic Asylums.—XLII. ....	517
Edinburgh .....	519
London Churches of the XVII. and XVIII. Centuries	519
Cast-Iron in Builder's and Contractor's Work.	520
—XXI. ....	520
Designing of Steel Bridges, Theoretical and Practical.	522
—XXVIII. ....	522
Notes on Domestic Drainage.—X. ....	523
Obituary .....	524
Architectural and Archaeological Societies .....	524
The Building News Directory .....	524
Our Illustrations .....	525
Church of St. Margaret, Frizinghall .....	526
Competitions .....	526
Building Intelligence .....	544
Engineering Notes .....	544
A History of Architecture .....	545
Books Received .....	545
Correspondence .....	546
Intercommunication .....	546
Legal .....	547
Legal Intelligence .....	547
Water Supply and Sanitary Matters .....	548
Our Office Table .....	549
Meetings for the Ensuing Week .....	549
Trade News .....	550
Tenders .....	550

## ILLUSTRATIONS.

THE PASSMORE EDWARDS SOUTH LONDON ART GALLERY.—

CHRIST CHURCH, SPITALFIELDS.—THORNTON HOUSE, CHESHIRE.—DISTRICT COUNCIL BUILDINGS, NEW HUNSTANTON.—WESLEYAN CHURCH, WOLSTANTON.—CHURCH OF ST. JOHN, FRIZINGHALL, YORKS.—THE BARS OF THE CITY OF YORK.

## Our Illustrations.

THE PASSMORE EDWARDS SOUTH LONDON ART GALLERIES AND TECHNICAL INSTITUTE: LORD LEIGHTON MEMORIAL.

THIS building will form a conspicuous feature in the Peckham-road, the site occupying a commanding position nearly opposite the Camberwell Central Library, and not far from Sir Gilbert Scott's grand church of St. Giles on the other side of the way. The purpose of the undertaking is twofold—viz., to furnish a suitable and more commodious entrance to the art galleries, which are situated to the rear of the site, and to supply accommodation for a technical art school, which will be carried on under the direction of Messrs. Geo. Frampton, A.R.A., and W. R. Lethaby, who are appointed by the Technical Education Board of the London County Council, and the institute will be supported by grants from this board, of which Dr. Wm. Garnett is the secretary. The ground plan which accompanies the perspective view shows the modelling studio, the entrance to the galleries and schools, the directors' office, men's cloak-room, and conveniences. In the basement are workshops for metal-workers, enamellers, and possibly wood-carvers. A residence is provided for the caretaker, and a heating-chamber and coal-store are arranged. To the left of the basement a through way is continued a few feet below the ground level as an approach to the rear premises, and by means of which heavy objects intended for exhibition can be transferred to the picture galleries. On the mezzanine level a ladies' retiring-room is located, with a lavatory, &c., approached from the main staircase, and also by way of the gallery in the modelling studio, which is 18ft. high. The half-space studio, likewise at the mezzanine level, is intended for the execution of smaller works. On the top floor there are two big studios extending over the whole area of the building, excepting the part occupied by a room for the masters, with their lavatory. The portal is to be executed in granite, and on the keystone of the archway will be a dedication cartouche, bearing the name of the late Lord Leighton, who was the first president of the South London Art Galleries, which have now been transferred to the Commissioners of Public Libraries and Museums for Camberwell. The City Parochial Charities have, by a grant of £3,000, cleared the galleries from existing liabilities, and Mr. J. Passmore Edwards has undertaken to give £5,000 for the erection of the new buildings herewith illustrated. This gift supplementing recent promises with respect to new libraries at Nunhead and Dulwich, and the previous cost of one of the picture galleries in the Peckham-road, brings Mr. Passmore Edwards's

benefactions to Camberwell up to between £13,000 and £14,000. Mr. Edward Foskett, F.R.S.L., is the librarian and acting curator. The transfer of the property has been considerably advanced by the active interest of Lady Burne-Jones, Mr. Wyke Bayliss, Mr. Pexton, and other members of the council of the Art Gallery who have rendered aid in bringing about this result. The building, which is to be commenced shortly, will be executed in red brick, with stone dressings, and in the gable over the entrance will be located a sculptured group representing "Architecture," "Painting," and "Sculpture." The façade faces the south, so that the large windows of the studios will be situated towards the back of the building, where a fine north light will be obtained. The architect is Mr. Maurice B. Adams, F.R.I.B.A.

## CHRIST CHURCH, SPITALFIELDS.

(SEE "London Churches of the XVII. and XVIII. Centuries," on page 519.)

## THORNTON HOUSE.

THIS house has been built upon a high point of the Wirral of Cheshire, for Mr. J. D. Lever. It has the advantage of a fine old garden and grounds, as it occupies the site of a former house. It is built of English oak framing, all solid, prepared by Messrs. Rattee and Kett, of Cambridge, and the masonry is red Heswall stone, and the roof Yorkshire flag slates. There is no contractor, the workmen being engaged by the clerk of works; but all the internal woodwork is estimated for, and supplied by local firms. There are picturesque stables and lodges in the same style. The architects are Messrs. Graydon and Ould, of 31, James-street, Liverpool.

## NEW HUNSTANTON COUNCIL BUILDINGS.

THE building is being erected from the designs of Messrs. George J. and F. W. Skipper, F.R.I.B.A., architects, of Norwich, whose plans were chosen in a limited competition among architects some few months back. The walls are constructed of the pretty brown Carr stone of the neighbourhood, relieved by window and door dressings of Monk's Park Bath stone. The roofs are covered with Broseley flat tiles. Standing, as it does, on a commanding site, kindly presented by Mr. Hanson le Strange, next the Golden Lion Hotel, the building will form a central and attractive feature in the group of buildings surrounding the green, with its ancient ruined cross, and opposite the pier and general approach to the sea front and cliffs. Certainly a better site could not have been found. The large hall will be 77ft. long and 37ft. 6in. wide, and will have an open-timbered roof of massive principals. There will be a gallery at one end, and a broad and deep platform or stage at the other end, suitable for lectures or entertainments of any kind, and provided with retiring rooms. The windows will be mullioned and transomed, and the walls will have a dado of matchboarding to mid-height. The council offices will be approached by a side entrance in an octagonal annexe, and here, on the first floor, the council chamber will occupy a most commanding position, and have a splendid view from its windows. Adjoining it will be the clerk's office, and on the ground floor beneath will be the surveyor's office, &c. Mr. Walker, the surveyor to the council, acts as clerk of the works.

## WESLEYAN CHAPEL, WOLSTANTON, STAFFORDSHIRE.

THE building occupies a good position on the main road, taking the place of the old chapel, and is an example of the application of Late Gothic for modern uses, aiming at a broad treatment. It is built of red bricks with red stone dressings and tracery, the roofs being covered with Bangor slating, and the windows are filled with leaded lights. At the end of the nave is a memorial window filled with stained glass, by Messrs. Camm Bros., of Smethwick. Internally the plan is cruciform, the nave being 85ft. long and 30ft. wide, separated from the side aisles and transepts by arcades of wood with teak pillars, and carrying a clerestory. It is seated with open benches, and a handsome rostrum and Communion space are provided, all of pitch-pine varnished; there is also an alabaster font by Mr. J. J. Millson, of Manchester. The accommodation is for 700 on the ground floor and 50 in the orchestra, where it is intended to place an organ, now in course of erection, at a cost of £400. The heating is by high-pressure hot water, and ventilation by a roof extractor in a turret. The

cost has been, exclusive of memorial window and font, £3,600. The design was selected in a limited competition, the architect being Mr. A. R. Wood, of Tunstall and Burslem.

## THE BARS OF YORK.

MICKLEGATE BAR, or the south gate of the city, is in general form that of a rectangular tower, with circular embattled turrets at the four angles, as are also Bootham and Monk Bars. Previous to the year 1754 the only entrance by Micklegate Bar was through the barbican, which stood in front of the centre arch in that year, an archway being opened on one side for foot-passengers; whilst in 1827 a similar alteration was made on the other side, and the barbican removed. The two small doors half-way up the tower originally led out on to the ramparts of the barbican. It was the custom to disfigure this bar by fixing upon the top the heads of traitors, stuck upon long poles. Bootham Bar, or the north gate, had in 1714 the inner front completely rebuilt. In 1831 the barbican was pulled down; but the heavy portcullis still remains, and may be seen hanging over the outer arch, the grooves in which it used to run having, however, been walled up. The outer turrets are surmounted by stone figures, renewed as lately as 1893. Monk Bar, so called after General Monk, is probably the finest of the four. As at Micklegate, the doors which opened on to the barbican may be seen half-way up, the barbican itself being removed in 1825, the portcullis, however, still remaining. Inside the bar are two stories of vaulted chambers, whilst the gateway itself has a groined roof. On the outer turrets are stone figures holding heavy stones to drop upon any foe attacking the city. Walmgate Bar is the most complete of them all, still having the barbican, portcullis, and heavy oak gates. About the year 1720 an addition seems to have been made on the inside front to the original stone bar, in the shape of a two-storied front of plaster and wood construction, supported on two fine sturdy stone columns. All the bars are decorated with coloured shields bearing the Royal and city arms, Micklegate, in addition, having those of Sir John Lister Kaye, who was Lord Mayor of York in 1727.

## CHIPS.

The gas manager and electrical engineer to Aberdeen Corporation have prepared a report as to the extension which they consider necessary for the electrical system of that city. It is proposed that the buildings and plant should be extended, at an estimated cost of £9,500, and the mains extended to supply part of the west end and other districts at a cost of £10,000, making a total outlay of £19,500.

The city council of Gloucester have agreed to pay Messrs. Crews and Holbrough a premium of £150 to complete the contract in connection with the town water supply for the city by July 15, instead of October 2.

The foundation-stone of the new North Bridge, at Edinburgh, will be formally laid on Monday, May 25th.

In order to allow of a thorough repair and re-drainage of the building, the Royal College of Science at South Kensington, including the Royal School of Mines, will be closed for about three months during this summer, the Treasury having given their sanction for sanitary works to be undertaken at a cost of £3,000.

The town council of Dudley have received a report from their technical instruction committee recommending the purchase of a school-building and land appurtenant thereto in Stafford-street, offered to the corporation by the school board for the sum of £750, and that the necessary alterations and repairs be made thereto so as to adapt the buildings for use as a technical school, the purchase and alterations being estimated to cost £1,200.

The Eccles Town Council have agreed upon a scheme prepared by the borough surveyor, Mr. A. C. Turley, C.E., for the regulation and inclosure of the several plots of land forming Monton Green, and will seek from the Local Government Board for sanction to borrow £970 to defray the cost of laying out and inclosing the grounds.

The promoters of the Basingstoke and Wokingham Railway Bill do not intend to proceed with their scheme. It was the incorporation of a company for making a railway from a junction with the London and South-Western Railway at Basing to a junction with the South Eastern at Wokingham.

The South Kensington and Bethnal-green Museums have this week been opened for the first time on a Sunday. The number of visitors at South Kensington was 7,163, and at Bethnal-green 3,026.



## CHURCH OF ST. JOHN FRIZINGHALL YORKS

MESSRS H &amp; E MARTEN ARCHT



## CHURCH OF ST. MARGARET, FRIZINGHALL.

**THIS** church, the name of which has been altered from St. John to St. Margaret, which is now in course of erection at Frizinghall, a suburb of Bradford, is to accommodate 550 people at a total cost of £4,000. The inside measurements of this church are as follows:—Length 100ft., width of nave 21ft., and height 36ft. The work is being executed in “inside” wall-stones with ashlar dressings, the roof being covered with blue Westmoreland slates. The benches, &c., are carried out in pitch-pine. The builders intrusted with the various works in connection are as follows:—Messrs. J. Bairstow, mason; J. Moulson and Son, joiners; G. Swaine, plumber; B. and T. Thornton, slaters; A. Taylor, plasterer. Mr. Elliott is acting as the clerk of works, and the architects are Messrs. H. and E. Marten, of Bradford and Harrogate.

At Rochdale, Duckworth's Hotel, in Drake-street, which has just been converted into a Reform Club, has been reopened. Messrs. Butterworth and Duncan, of Rochdale, were the architects, and the chief contractors were Messrs. J. and J. Coates, of same town.

The painter of “Saint Cuthbert,” the large triptych at the Luxembourg Gallery, M. Ernest Duez, died on Saturday, aged 53 years. His first success at the Salon was a diptych, “Splendeur et Misère,” in the Salon of 1874. Other well-known works by him are “The Pivoines” (1876), the portrait of Ulysse Butin, “St. François d'Assisi,” “Vieille Pecheuse,” “Soir,” and “Virgile dans les Bois.” He was the leader of the open-air school of painters, and one of the leaders of the revolt which resulted in 1890 in the creation of the Société des Beaux Arts.

## COMPETITIONS.

**ABERDEEN.**—A special committee of the town council, along with Mr. Simpson, architect, of Leith, revised on Monday the terms of competition for the design of the corporation lodging-house to be erected in West North-street. Alternative plans of buildings to accommodate 200 and 250 lodgers respectively are invited, and the cost of a building providing the latter accommodation is not to exceed £9,000, exclusive of furnishings, instead of £10,000, as formerly proposed.

**CAMBRIDGE.**—A limited competition of considerable importance has just been settled for the designs of a new Presbyterian College at Cambridge, an institution of similar character to the Mansfield College for Nonconformists at Oxford. Mr. J. MacVicar Anderson, F.R.I.B.A., was the professional referee. The cost of the buildings, it is said, will be nearer £100,000 than £50,000. The selected design is by Mr. Henry T. Hare, of the Adelphi, and the second premium was awarded to Mr. W. H. Seth-Smith, of Lincoln's Inn. Among the other competitors were Mr. J. J. Stevenson, Mr. A. E. Street, M.A., and Mr. Worthington, of Manchester. The Synod of the Church has yet to confirm the award, and this will probably be done towards the end of this month.

**CROYDON.**—The town council of Croydon invite designs for a borough lunatic asylum, to be built at Warlingham. Premiums of £200, £100, and £50 will be awarded to the authors of the designs respectively placed by the assessors first, second, and third. Designs are to be sent in by Wednesday, July 8th next.

**INVERNESS.**—The town council proceeded on

Monday night to make a selection from among the models sent in for competition for the Flora Macdonald memorial to be erected in Inverness. The vote was taken by ballot, the result being as follows:—For “Au Faire” 14, for “Finnuella” 2, for “Experto Crede” 1. The model having “Au Faire” for its motto was therefore chosen as the design for the memorial, and proved to have been sent in by Mr. Andrew Davidson, sculptor, Inverness. It represents Flora Macdonald in an attitude of watchfulness. Her right hand shades her eyes as she gazes into the distance; a Highland collie is at her side looking up into her face. Exception was taken at the meeting to the classical character of the drapery, and to the arms, feet, and head being wholly uncovered. It is said that the design will undergo alterations in some of these details. The late Captain Macdonald, who claimed descent from the Highland heroine, bequeathed £1,000 to defray the cost of the memorial.

The North Cornwall Railway Bill, extending until 1901 the period for the completion of the line to Padstow, and until 1899 the period for the compulsory acquisition of land, has passed through Committee stage in the House of Lords without opposition.

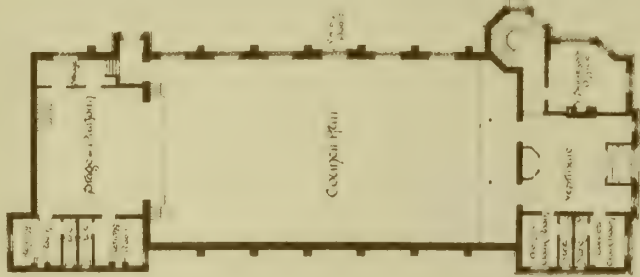
The Strand District Board of Works have decided that the following streets shall be paved during the ensuing year by the Improved Wood Pavement Company and the Val de Travers Asphaltic Paving Company, at a total cost of £3,415:—Carting-lane and Somerset-street (wood), Catherine-street (part of footway, asphalt), Floral-street (wood), Gerrard-street (wood), Greek-street (wood), King-street (wood), Macclesfield-street (wood), Portsmouth-street (wood), Portugal-street (wood), and Shipyard (wood).







DISTRICT COUNCIL BUILDINGS  
NEW HONSTANTON  
DESIGNED BY GEORGE J. SKIPPET, R.I.B.A.  
AND J. W. SKIPPET, ARCHTDS.



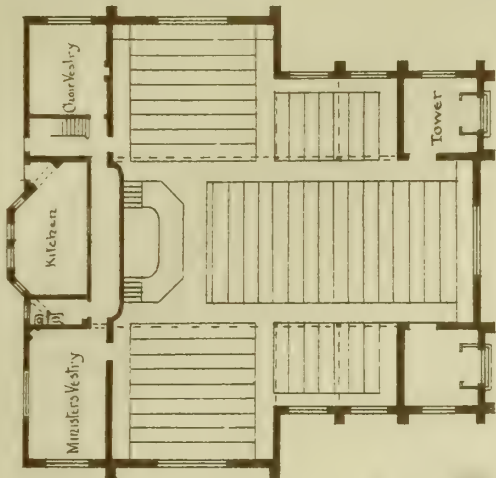
THE DISTRICT COUNCIL BUILDINGS, NEW HONSTANTON. (See page 10.)



PHOTO TINT BY J. W. SKIPPET, R.I.B.A. AND J. W. SKIPPET, ARCHTDS.



WESLEYAN CHURCH  
WOLSTANTON  
A. R. Wood Architect



Ground Plan.



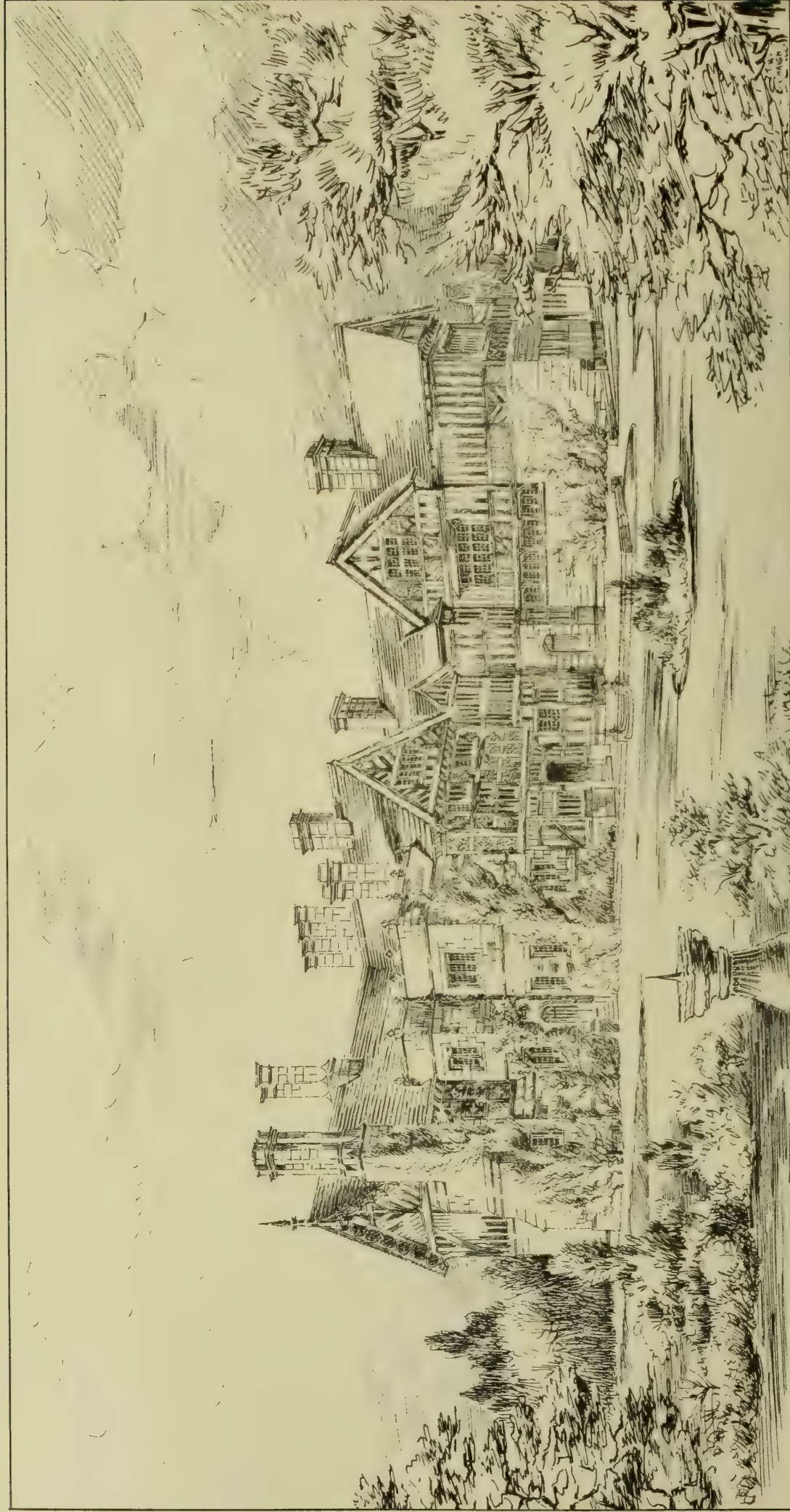












THORNTON HOVSE : CHESHIRE :  
J. D. LEVER ESQ :



GROUND PLAN







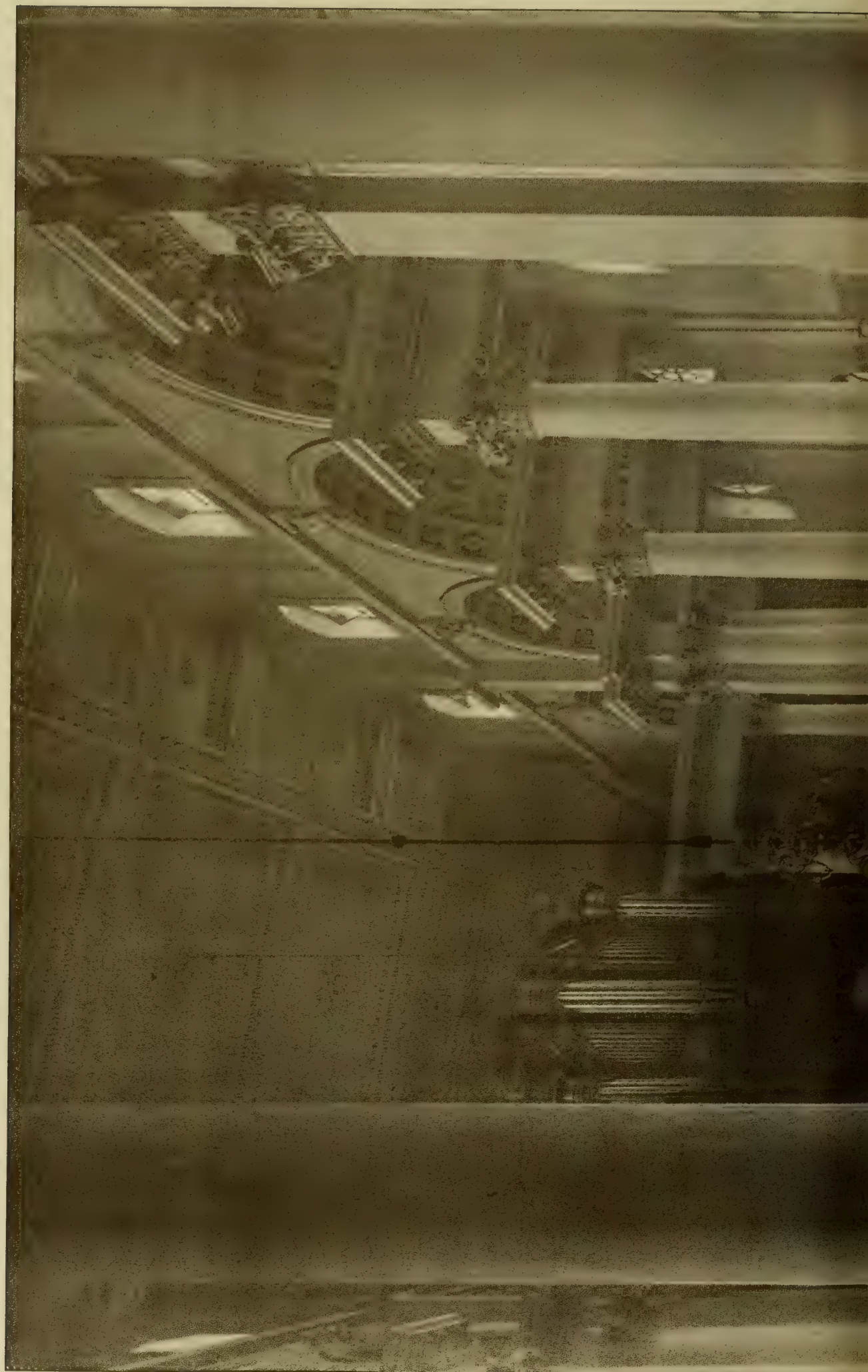








THE BUILDING DEWS, APRIL 10, 1896.







"PHOTO-TINT" by Anna A. Abbott. Queen Square, London, W.

CHRIST CHURCH · SPITALFIELDS ·

FROM "LONDON CHURCHES OF THE XVII & XVIII CENTURIES" BY GEO H BIRCH FSA

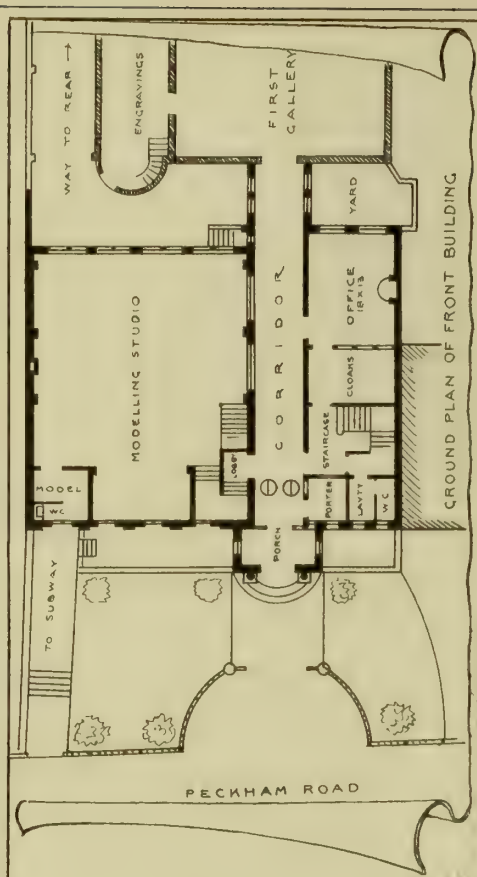




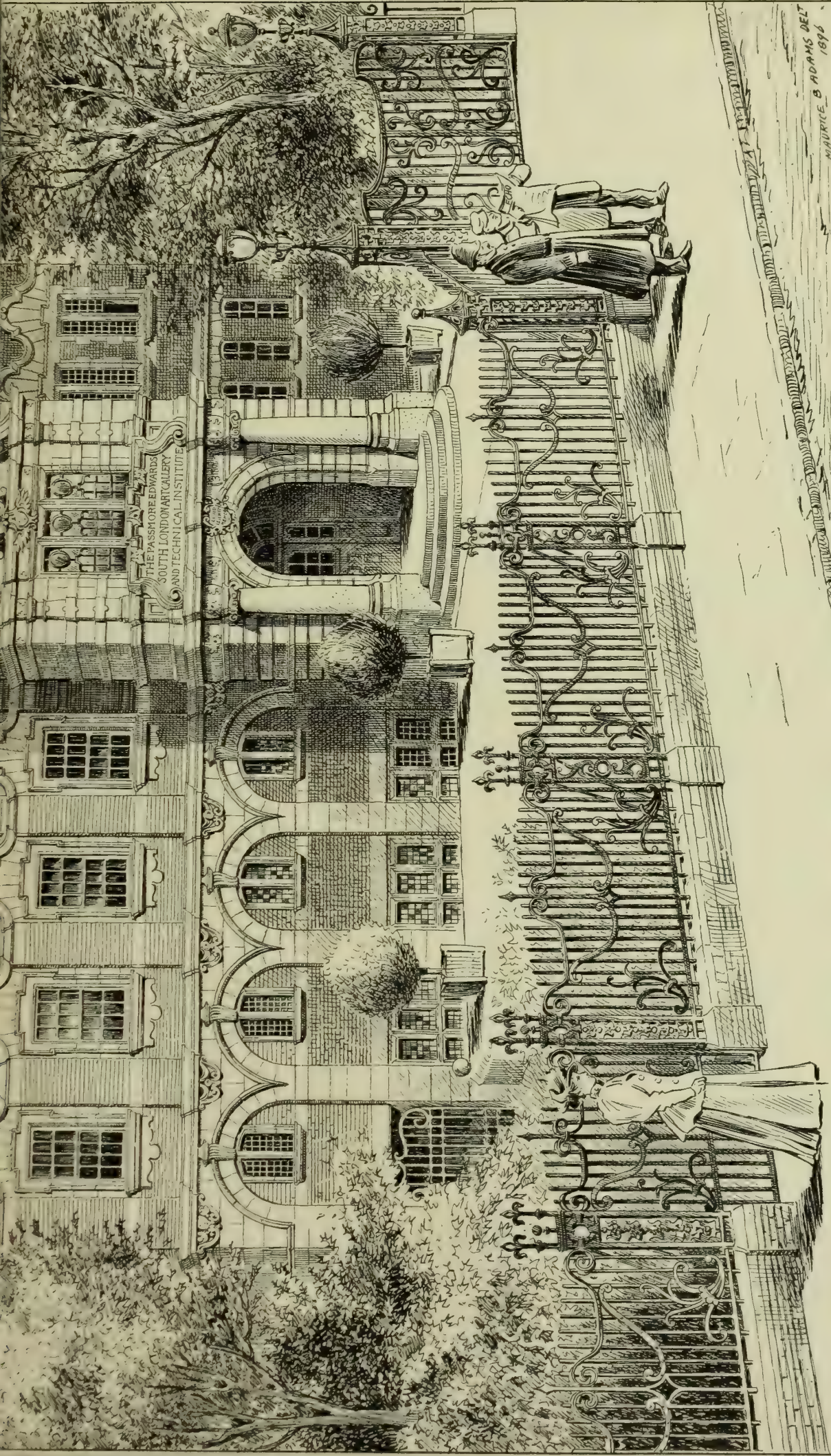












THE PASSMORE EDWARDS' SOUTH LONDON ART GALLERY AND TECHNICAL INSTITUTE (LORD LEIGHTON MEMORIAL)  
Peckham Road for THE COMMISSIONERS OF PUBLIC LIBRARIES & MUSEUMS FOR CAMBERWELL. MAURICE B. ADAMS FRIBA, ARCHT  
CHISWICK W.

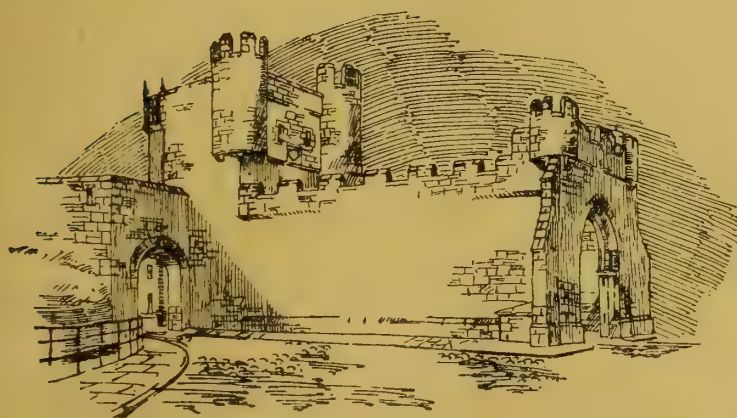
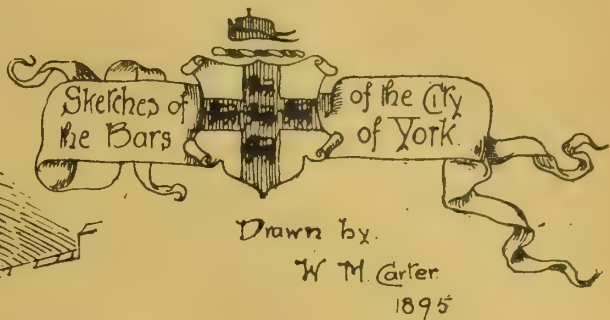
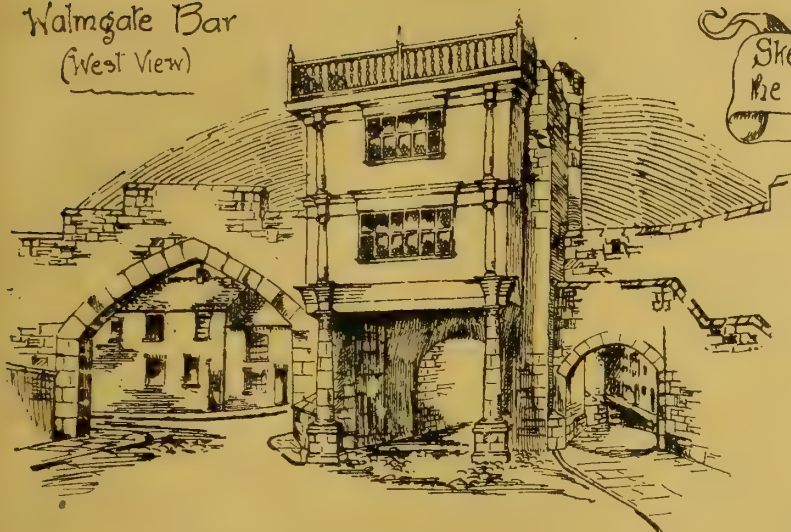
PROPOSED TO BE BUILT IN THE PECKHAM ROAD.



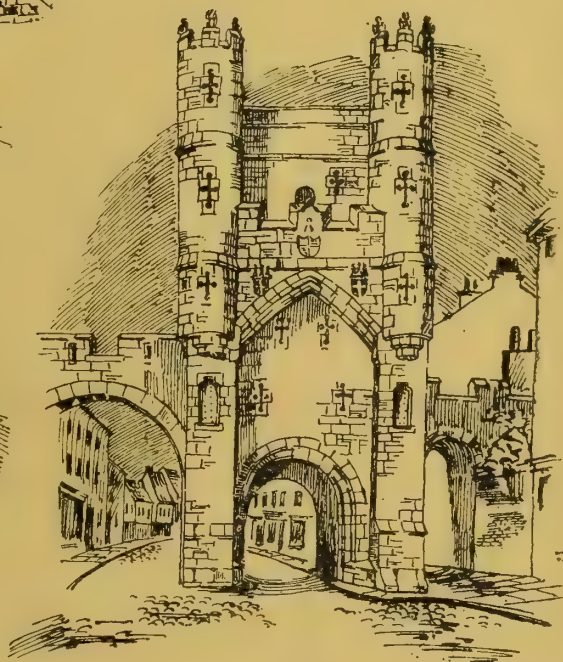




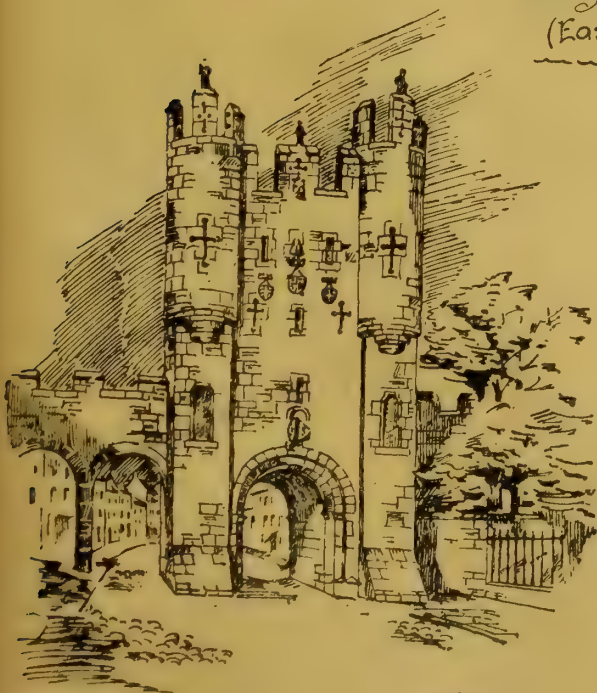
Walmgate Bar  
(West View)



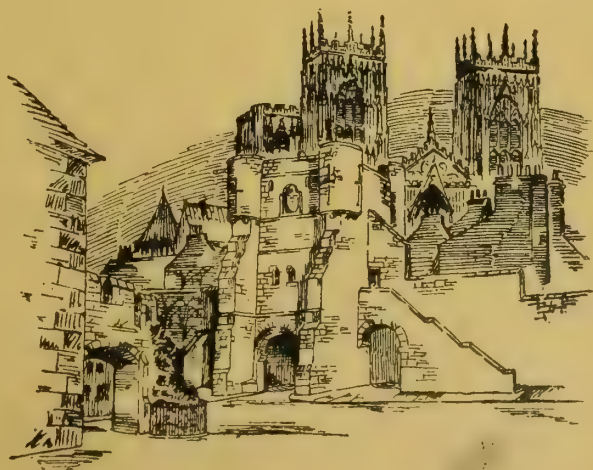
Walmgate Bar  
(East View)



Monk Bar



Micklegate Bar



Bootham Bar



## Building Intelligence.

**BRAMLEY, LEEDS.**—The memorial stones of a new Sunday-school, to be built in connection with Zion Baptist Church, Bramley, were laid on Monday. The school replaces a building opened as a chapel in 1844, and will be constructed from plans prepared by Mr. Walter A. Hobson, of Leeds. The style is English Renaissance. The walls will be of local stone, faced with Horsforth sandstone. The roof will be slated, the internal woodwork of stained deal, and the corridors tiled. On the ground floor there will be seven glass-rooms, each 10ft. by 13ft.; a young men's meeting-room, 22ft. by 14ft. 6in.; and a small lecture-room, 35ft. by 21ft. Four of the classrooms will open out of the lecture-room, and these will be so arranged with screens that they can be thrown into one room. Stone staircases will give access to the assembly-room on the first floor. This room will be 61ft. by 35ft. 6in., and 23ft. high. It will accommodate between 500 and 600 persons. Adjoining will be two reception rooms, and above these two classrooms. Adjoining the school, and arranged to harmonise with it, two dwelling-houses will be erected, one for the pastor and the other for the caretaker. The total cost will be about £2,500. The contractors are:—Mr. W. W. Haley, Bramley, excavators', bricklayers', and masons' work; Messrs. John Trickett and Son, Bramley, carpenters' and joiners' work; Messrs. Sharp and Harper, Leeds, slaters' work; Mr. J. Bannister, Rodley, plumbers' and glaziers' work; Messrs. Joseph Laycock and Sons, Staningley, plasterers' work; and Mr. E. W. Walker, Idle, painters' work.

**NEWCASTLE-ON-TYNE.**—The John Knox Presbyterian Church, at the corner of Elswick-road and Beech-grove, was opened on Tuesday. It is seated for 750 persons, and is planned as a closed horseshoe. The building is lighted by electricity. The halls, classrooms, and vestries were built by Mr. G. H. Mauchlen, contractor, Newcastle; and the church and cloakrooms, by Mr. Alex. Pringle, contractor, Gateshead. The whole buildings were designed by Mr. W. Lister Newcombe, F.R.I.B.A., Pilgrim-street, Newcastle.

**ROCHDALE.**—The new offices of the Rochdale Guardians, opened last week, are situated at the back of the old offices at Townhead, the central corridor in the latter having been continued right through the new building. On the ground floor there are a large waiting hall, a room for the relieving officers, and two ante-rooms. The new boardroom on the first floor measures 40ft. 6in. by 28ft. A wainscoting of pollard oak runs round the walls. On one side of the room there is a dais for the chairman, vice-chairman, and clerk, and over the chairman's seat is a massive canopy of oak. The chairs of the guardians are arranged round the other three sides of the room in two rows, the back row being placed on a raised tier. There is a long desk in front of each row. Windows are provided on three sides of the room. On the upper corridor is a room for the Assessment Committee. Cloakroom and lavatory accommodation have likewise been provided. Messrs. S. Butterworth and Duncan, of Rochdale, were the architects. Messrs. Thomas Berry and Son had the general contract for the erection of the building, and they did the brickwork and masonwork themselves. Mr. William Driver undertook the joiners' work, Mr. Isaac Butterworth the plumbing, Mr. A. Haigh the slating, and Mr. Purdy the plastering.

**THE MOSAIC DECORATIONS AT ST. PAUL'S.**—The recently-completed decorations of the choir of St. Paul's Cathedral were opened to inspection for the first time on Saturday afternoon. The Lord Mayor and Corporation attended in state, and were met at the west end of the cathedral by the Bishop of London, the Dean and Chapter, and the cathedral staff, whence they walked in procession to the choir in the following order:—The craftsmen who have executed the work, wearing red badges; the cathedral working staff, followed by Mr. Hardinge; Mr. J. Powell and Mr. H. Powell, of Whitefriars, the contractors; Mr. W. B. Richmond, R.A., the designer of the work; the choir; the Minor Canons; the Prebendaries; the Residentiary Canons; and the Bishop of London, attended by the Dean of St. Paul's and the Archdeacon of London. The work has been carried out in glass "stick" mosaic, the various colours of glass, in about 150 tints, being cast in sticks, which are broken into small pieces,

and then stuck into cement, the surfaces being left rough. The prevalent colour effects are gold, rich blues, and ruddy browns. The general scheme consists of a Majesty over the central compartment of the apse, with attendant spirits. The three domes over the choir represent the Creation. The clerestory is occupied with the history of the Holy Temple and the Tabernacle, with representations of Solomon, David, and others who were instrumental in rebuilding the Temple in the time of Ezra. There are also representations of Jacob's Dream, Moses with the Tables of the Law, Abraham and the Three Men, and of Sarah looking through the door of the tent (Genesis xviii.), and of Job and his Friends. At the east end, over the apse, is the Divine Majesty seated upon a rainbow in the attitude of benediction. All these subjects are inscribed with appropriate passages taken either from the Scriptures or ancient Latin hymns. About 26,000sq.ft. of mosaics have now been placed in position.

### CHIPS.

Extensive works of sewerage are being carried out at Chadderton, for the urban district council, from plans and under the supervision of Mr. James Diggle, C.E., of Heywood.

The Leith School Board have adopted plans by Mr. S. F. Notman, their superintendent of works, for making additions to North Fort-street school, at an estimated cost of £2,500. Accommodation will be provided for 200 additional scholars.

Considerable discussion has taken place upon the desirability of providing a new town-hall for Cardiff, and the site that it should occupy. The latest scheme is one initiated by Councillor Robinson, comprising town-hall, law-courts, and municipal offices, to be erected on a site at Temperance Town, at a cost of £191,000. The special committee who have the question in hand have decided to obtain information as to the terms upon which the leasehold and freehold interests can be acquired.

A special service has been held in the Priory Church at Dunstable, when the new peal of bells, the hanging of which has just been completed, was dedicated. There are eight bells in the peal, four of these having been entirely recast by Messrs. Taylor and Co., of Loughborough, while the whole peal has been fitted with new fittings. The cost of recasting the bells, repairing the bell-frame and ringer's loft, has amounted to £300.

The President of the Royal Scottish Academy (Sir George Reid) has purchased on behalf of the M'Kelvie Trust Art Gallery, Auckland, New Zealand, the following nine pictures now on view at the Scottish Academy's exhibition at the Mound, Edinburgh:—"A Border River," by G. W. Johnstone; "The Cottar's Saturday Night," by W. Hole; "Summer—Sunshine and Shadow," by J. Denovan Adam; an "Idyl," by Alexander Roche; "Rowans," by George Henry; "The Haven under the Hill," by A. D. Reid; "Glencairn," by James Paterson; "Coming Events cast their Shadows Before," by R. Payton Reid; and "A Border Ballad," by W. S. MacGeorge. This is the third year that the trustees of this New Zealand Gallery have requested Sir George Reid to do them a like service.

The Duke of Newcastle has leased about 30,000 acres of land on his Nottinghamshire estate to the Wigan Coal and Iron Company, and a few days hence the Duchess of Newcastle will turn the first sod of a new colliery in the heart of Robin Hood's country. The cottages are to be built three and four together, and not in long rows. Of late years the woodland district on the borders of Nottinghamshire and Derbyshire has suffered greatly through the development of coalfields. Though the first colliery shaft will not touch what is known as the Dukery drive, it is expected that this will be interfered with before many years. A new colliery has already been opened at Cresswell, the smoke from which can be detected at Welbeck, the seat of the Duke of Portland, and in a few years this woodland and picturesque locality of romance promises to be the scene of smoky factories.

At Escot parish church, Devon, the Augusta Kennaway memorial pulpit was dedicated on Sunday. The pulpit, of oak, is of massive proportions. The base is square, and from a plinth spring columns of ebony surmounted by carved capitals, the foliage upon which is oak. Above these, up to the floor line, moulded ribs carry the main portion of the pulpit, which is octagonal in form, and is surrounded by a carved cornice. The recessed panels each contain linen-fold carved work. Upon the centre one, in raised characters, is the sacred monogram. The upper cornice bears the text, raised in the solid oak and intermingled with foliage, "Thy word giveth Light." The pulpit has been mainly made from a design of Miss Vyryan, and is the handiwork of Messrs. Harry Hems and Sons, of Exeter.

## Engineering Notes.

**MORECAMBE.**—The new West End Pier was opened on Easter Monday by Colonel Forster, M.P., of Hornby Castle. The construction of the pier was begun in March, 1895. Thirteen contractors tendered, and the contract was let to the Widnes Foundry Company, whose tender was also afterwards accepted for the pavilion. The cost of the first section, 1,000 lineal feet in length, including the pavilion, with a promenade 38ft. wide, has been about £24,000. The girders and wrought work are all of mild steel, with cast-iron piles. The pier-head widens out to 144ft., and is 225ft. in length. The pavilion is 154ft. by 86ft., and 32ft. in height, the central steel dome rising to a height of 90ft. above the sands, while at the four angles are minarets, each 45ft. high, and, like the dome, covered with zinc. The pavilion is capable of holding 2,000 persons on the ground floor; there are also galleries on three sides. The pavilion is constructed, at the stage end, as a theatre, with dressing and retiring rooms, and other appurtenances. The stage is 30ft. in depth and of considerable width, so that either opera or variety entertainment can be given. The pier and pavilion have been constructed from the designs of Messrs. Mangnall and Littlewoods, architects, of Manchester.

**QUEENSFERRY.**—The work of constructing the bridge over the River Dee, Queensferry, is being rapidly pushed forward by the contractors, the Deeside Iron and Engine Company, and it is hoped to have the bridge finished and in working order by the end of May. On each side of the river there is a fixed span of 130ft., and the space between the two (120ft.) will be bridged by means of rolling girders from each end, on the telescopic principle. The width of the vehicular road in the centre will only be sufficient to allow one vehicle to pass over the bridge at a time; but on each side there will be a path for foot passengers, 3ft. 6in. wide. When a vessel approaches the bridge, either going up or down the river, the telescopic girders will be drawn in to leave a passage open, and there is a contrivance by which the railings collapse into a compact form to allow this to be done. The cost of the bridge will be about £13,000, the chief contributing bodies being the Flintshire and Cheshire County Councils and the Dee Conservators.

**SNOWDON MOUNTAIN TRAMWAY.**—The new mountain tramway from Llanberis to the summit of Snowdon has gained unexpected notoriety by the fatal accident which marred the opening on Saturday. The line is modelled upon the Swiss mountain railways, and is almost exactly similar to the Rothorn line. The funicular principle was discarded in favour of the rack-rail, the rack chosen being a modification of the Abt system. The length of the line is  $4\frac{1}{2}$  miles, the total rise 3,140ft., the steepest gradient 1 in 5.5, and the average gradient 1 in 7.83. Two miles of the entire length are in curves, of which altogether there are 34, but none of which has a sharper radius than four chains. The permanent way is all of steel, the rails being of the Indian State railways pattern, and attached to rolled steel sleepers. The rack is laid double throughout, the parallel bars being each four-fifths of an inch thick on gradients not exceeding 1 in 10, and an inch thick on all steeper grades. The gauge is 2ft. 7 $\frac{1}{2}$ in. There are terminal stations at the bottom and top and three intermediate equidistant passing places. The line has yet to be fenced throughout, and afterwards an hotel will be built on the summit. The carriages are of the tramcar type, but with the seats facing fore and aft, and two will form a train, with accommodation for 112 passengers. The route follows roughly the footpath from the Llanberis side; but diversions have been made with the object of improving the view and equalising the gradient. The line presented no great engineering features, the only work of any importance being a viaduct of 14 arches. The cost has been about £64,000. The engineers are Sir Douglas Fox and Mr. Andrew Fox, of London, and the contractors Messrs. Holme and King, of Liverpool.

The recent report by Mr. Colson as to the unsafe state of the roof of Winchester Cathedral has awakened considerable interest in the matter, and the Dean and Chapter, the Earl of Northbrook, and Mr. Nicholson have promised £1,000 each, while many smaller sums have been subscribed.



## A HISTORY OF ARCHITECTURE.\*

ALTHOUGH the student of architecture has a few good manuals and textbooks of the history of his art—as that of Fergusson—there has been no one book of moderate compass and cost which gave him in a complete and classified form the results of the latest researches of architectural historians and archaeologists, and which at the same time furnishes the student with a comparative and analytical view of the subject. Professor Banister Fletcher, F.R.I.B.A., Professor in King's College, assisted by his son, Mr. Banister F. Fletcher, A.R.I.B.A., Instructor in the architectural studio in the same college, has written a book which appears to fulfil these necessary qualifications. It is concisely written and profusely illustrated by all the typical buildings of each country and period, printed in colotype from large photographs by the Direct Photo-Engraving Company, Ltd., and also by special plans and maps from line drawings. In a work of this kind, intended chiefly for students who require a reliable outline of architectural history, a systematic method of dealing with each period or style is of the first importance, and the authors have adopted an analytical method based on the essential parts of a building. As the authors say, architecture has been too often isolated from its surroundings, such as the physical conditions, geography, social and historical development of each country. In Prof. Banister Fletcher's new book, each style has been treated under five sections. The first summarises the geographical, geological, climatic, religious, social and political and historical influences; the second section describes the architectural character; the third gives examples of the chief buildings in each style, representing the *corpus* which the preceding influences result in; the fourth section gives a comparative analysis of features of plan, walls, openings, roofs, and other elements; and the last section gives lists of books or authorities on each style. By this method the student is taught to regard each style as a natural product or development of certain physical and national or religious influences, instead of a mere fortuitous combination of forms, which some books appear to assume, and he is enabled by the analysis to compare the parts and features of buildings of one style with those of any other style or period. This system of comparison and analysis will be found of great value to the student as affording him a clearer grasp of those differences which mark off one style from another. A good general definition of architecture is given as "construction with an artistic motive." It would be impossible, in a short notice, to enter into any discussion of the various sections, which are amply illustrated by very excellent colotypes, enabling the reader to obtain a much better idea of the great historical examples than would be possible from wood engravings from the most carefully-drawn sketches. No fewer than 159 illustrations are given, every section or style having several examples. Thus, Egyptian architecture is illustrated by eleven photo. reproductions. Besides maps, we have capital representations of the Sphinx and Pyramid, the Great Pyramid of Cheops, a section showing the king's and queen's chambers and passages; rock-cut tombs at Beni-Hassan; plans of the temple at Karnac, temples of Philæ and Edfou, an Egyptian house, &c. Greek is very completely treated. The influences which led to Greek architecture are concisely described, and the differences between Egyptian and Athenian buildings pointed out. The authors here give the student a fair general idea of the Doric, Ionic, and Corinthian Orders, illustrated by a careful drawing of the Greek Doric from the Parthenon, and its division into parts. We also notice that the modes of lighting suggested by Fergusson and M. Botticher are illustrated by sections of the Parthenon. Sir Arthur Blomfield's restoration of St. Peter's, Eaton-square, is referred to as illustrating Fergusson's theory, the author himself favouring the theory that light was admitted through the door. A very useful plate of plans or types of temple arrangement enables the student to compare the relative forms and disposition of the columns, beginning with the simple Di-style in Antis, and Prostyle, and proceeding to the Peripteral-octastyle, exemplified in the Parthenon, the Dipteral-decistyle (Jupiter Olympus), and the Pseudo-

dipteral (Temple of Selinus). The diagram exhibiting the methods of spacing the columns, known as the "pseudostyle," "systyle," "eustyle," "diastyle," and "areostyle," will make the student understand those often misunderstood terms. Examples of each Order are then given, and a capital colotype view of the Parthenon, taken at the angle, assists the reader to grasp the general arrangement of parts. In the comparative view the plans are compared; the Greek temples are described as "Egyptian turned inside out; the courtyard porticoes and columned halls being replaced by a small cella colonnaded on every face"—a description which at least generally connotes the difference to the mind of the learner. Under the head of "openings," these important parts are briefly explained and illustrated by the details of doorway to the Erechtheion. Under "Mouldings," the authors illustrate by a few well-chosen, though too small profile sections, the difference between the Greek and Roman mouldings, and another plate of details compares the Greek and Roman ornament. By thus bringing into one view the principal details of each style, the student can at once grasp the differences of form and type of these features. Pages of descriptive letterpress would fail to give him any clear ideas of these details. In this manner and in subsequent sections the authors have summarised and compressed in a few pages a vast amount of learning and information. The bibliographical references are sufficient; only brief reference is made also to the optical corrections in the entasis of columns, the stylobate and inclination of the axes of the angle columns of the Parthenon; but on this question the student is referred to Mr. Penrose's work. Roman architecture is similarly dealt with, though fewer plans are given. Early Christian or Romanesque in Rome and Italy is briefly treated. A typical plan of an Early Basilican church, that of St. Clemente, Rome, with a colotype view of the interior, affords the student a very good example of the early basilican model: other illustrations are those of St. Paul and St. Maria Maggiore, Rome. In the next section on Byzantine, the authors do not discuss the many theories which have been broached on the origin of the style, but confine themselves to the main characteristics of the style, which is typically represented by the church of Santa Sophia, of which a plan and views are given, also by St. Mark's, Venice, the illustrations of which are very good. The comparative analysis furnishes the student with the main distinction between the Romanesque basilican plan and that of the Byzantine church, the one leading the eye to the apse at the end, the other to the central dome: the one is horizontal the latter vertical in idea. We see that the able monograph, by W. R. Lethaby and H. Swainson, on Santa Sophia is noticed in the reference books; but the recent paper read by Mr. R. Phené Spiers, F.S.A., at the Institute, in which he showed that domed churches were built in France early in the 11th century, and that their structure differed from that employed in Eastern domes, has not been referred to in this or the chapter on French Romanesque. The Romanesque of Italy and France is prefaced by a general sketch of the style, and we find a few of the best examples are given to illustrate each development of this important offshoot of the Roman. English architecture, the Norman, and Gothic developments follow, and the authors have done full justice to this important branch. Plans of the chief types of cathedral churches, and illustrations of Salisbury, Lincoln, and other important ecclesiastical and monastic buildings are here furnished, each style being analysed and compared by the same method. Our space precludes further reference; suffice to say the chapters on French, Belgian and Dutch, German and Italian Gothic are illustrated by a few of the best known buildings, and we note the bibliographical notices are up to date, thus in French Gothic Corroyer's work is named. The Italian Renaissance and its many national developments in France, Belgium, Spain, and England, is the concluding part, and each of these varieties is illustrated, that of England being very representative and characteristic. As a general synopsis of architectural dates and style, Professor Banister Fletcher's work will fill a void in our literature, and become a most useful manual for elementary purposes.

## BOOKS RECEIVED.

*A Wandering Scholar in the Levant*, by DAVID G. HOGARTH, M.A., with illustrations (London: John Murray), is an interesting and graphic narrative of a scholars' wandering in the East, mainly in the countries bounding the Mediterranean on the north, east, and south. The author's style is chatty, pleasant, and discursive. The chapters are written, as the author describes, "bit by bit, at wide intervals of time, now on a steamer deck, now at a khan, now in a mud hut, now in camp." Our author's chief idea is to give his readers an impression of the life and antiquities of inland Asia and the Ottoman Empire. He describes the Cities of the Dead, the Hittite stone and inscriptions, night adventures, the experiences of the pestiferous khan, Nomad life, and these and other incidents are interwoven into an agreeable sketch, illustrated by a few photo-blocks by the author. One of these is the Temple of Zeus at Olba, another the Hittite stone at Bor, which he had some difficulty to secure for the purpose of making copies of the inscription. Photographic views of the Euphrates at Samosata, and of a Roman bridge of one span of 112ft. and 56ft. rise near Kiakhta, the Blue College at Sivas, &c., are given. The author's account of crossing Taurus, of ride through snow, and his chapter "An Impression of Egypt," are worth reading. Of Cyprus, too, Mr. Hogarth writes with some knowledge of the country and people, of temples and tombs, and our work in the island.—*The Modern Office-Building*, by BARR FERREE (New York: Broadway).—Mr. Barr Ferree, the architectural editor of the *Engineering Magazine*, and Hon. and Corr. M.Inst.B.A., &c., is the author of a treatise, a reprint from the *Journal* of the Franklin Institute, on the office-buildings of America. Mr. Ferree deals with his subject in a comprehensive manner. He illustrates his remarks by plans, sections, and illustrations of typical buildings. A Chicago steel rail and beam foundation, as used in "The Fair" Building in that city; the foundations of the Cable Building, New York; Masonic Temple, Chicago; details of New York commercial buildings; typical plans of the Schiller Theatre, Chicago; and views of the latter and the Tract Society's Building, New York. Many useful and practical remarks are made, and the author speaks of the various kinds of construction employed with solid, "mixed," and self-sustaining walls, the types of columns, floor-arches, steel frames, &c. He says that the office-building "has amply satisfied all the claims made for it"; that fires have been confined to the rooms in which they occur. The remarks on the design of these lofty structures is also dwelt upon in the concluding part, and are worthy of attention. No doubt recent efforts to make them architectural have met with some success; but the very multiplication of the story is, and must be, injurious to the qualification of architectural repose.—*Metropolitan Sanitation*, by W. HERBERT DAW, F.S.I. (London: Estates Gazette Office, St. Bride-street, Fleet-street) is a summary and critical examination of the "Public Health (London) Act," 1891, and will be found useful to all house owners, architects, surveyors, and builders. The author brings into view the conflicting requirements of the sanitary regulations in the Metropolis. The regulations of the vestries and local authorities of the Metropolis show the sad want of uniformity in sanitary matters. Each parish or district consults only its own ideas, or its own surveyor or inspector; in one district the authorities allow the old system of drainage to remain with a few changes, in another the owner is compelled to put down a new system of drainage. Mr. Daw in his pages shows how the Public Health Act of London has worked, and what are its powers and weak points. Those who have the charge of property, owners and others, will find the main provision of the Act stated briefly, as to their liabilities, nuisance orders, the powers of sanitary authorities, by-laws respecting drainage issued by the L.C.C. and the local authorities, and how far these can be enforced. Whether the sanitary authorities, for instance, can require that an existing drain should be completely watertight is still a doubtful matter. The sections of the Act which are of general use in this connection are printed in the appendix and several cases are cited making the work a useful handbook on the subject.—*Spon's Architects' and Builders' Price-Book*, by W. Young, architect (London: E. and F. N. Spon).—The twenty-third edition of this useful and alphabetically-arranged price and memoranda

\* A History of Architecture for the Student, Craftsman, and Amateur. By BANISTER FLETCHER, F.R.I.B.A., Professor of Architecture, King's College, and BANISTER F. FLETCHER, A.R.I.B.A. London: B. F. Batsford.

The foundation-stone of a free library for Cwm, Ebbw Vale, was laid with public ceremony on Wednesday in last week.



book is brought fully up-to-date. Besides the usual price lists, which are revised, the book contains several additions to the text, a chapter on electricity, with a complete specification, and estimates for electric lighting installations, lighting conductors, sections on concrete fireproof floors, the schedules of thickness of walls of the new Building Act, patents, trade marks, &c. Altogether the volume, which is well printed and arranged, makes a very comprehensive office textbook.

### CHIPS.

The annual dinner of the Artists' Benevolent Fund will be held on Thursday, April 30, at the Holborn Restaurant. The Marquis of Huntly will preside.

Bellaouston Park, extending to about 170 acres, which was bought by the Corporation of Glasgow as a public park for £50,000, will be opened to the public in June.

The new Canada branch dock at Liverpool, an adjunct to the great northern improvement scheme of the Mersey Docks Board—viz., the making of a new deep-water dock—will be completed in a few weeks' time. Already the water has been let into the dock, and all that remains to be done is a small amount of excavation and dredging, to finish off the connection between the river and the dock. The work has been carried out under the direct superintendence of Mr. A. G. Lyster, C.E.

Mr. B. J. Shier, surveyor to the lately-dissolved Ilminster Highway Board, has been elected surveyor to the Chard Rural District Council at a salary of £150 a year.

On Wednesday week, Colonel Langton Coke, M.Inst.C.E., sat at the Town Hall, Ellesmere, to hear an application from the urban district council of Ellesmere to borrow £4,000 for works of water supply. Mr. T. S. Stooke, the engineer, explained the plans.

At the London Sheriff's Court, Red Lion-square, Mr. Under-Sheriff Burchell and a special jury heard, on Tuesday, the case of "Moore v. the London School Board." It was a claim for the sum of £8,341 made by Mr. Henry Moore, builder, of 421, Mile End-road, in respect of 22 freehold houses and a builder's yard, the whole covering an area of 17,440ft., and situated in Portman-place, Globe-road, required by the London School Board for the purpose of erecting schools. The board offered £4,553; but the jury assessed the amount of compensation at £7,150.

On the evening of Saturday in next week Professor W. B. Richmond, R.A., will deliver at the Royal Institution the first of a short course of three weekly lectures on "The Vault of the Sistine Chapel."

Canon Rawnsley unveiled a fountain in memory of William and Dorothy Wordsworth in the public park at Cockermouth on Tuesday. The fountain is of Aberdeen granite, with a bronze figure above, and bears a suitable inscription. It has been executed by Messrs. Macdonald, of Aberdeen.

The memorial in Lincoln Cathedral to the late Dean Butler is to be unveiled on Saturday, the 25th inst., by the Bishop of Ely. It consists of a life-size recumbent effigy in alabaster on an altar tomb, and has been executed by Messrs. Farmer and Brindley, of Westminster Bridge-road.

Mr. Pierce, assistant to the borough engineer of Nottingham, has been appointed assistant city engineer of Calcutta.

St. Mary's Church, Mellor, near Blackburn, is to be restored and enlarged. Amongst the contemplated improvements is the reseating of the church and the extension of the present dwarf chancel, the latter alteration considerably increasing the sitting accommodation. The estimated cost of the work is about £1,400.

At Camborne Police-court, last week, William Henry Stephens, builder, of Penzance, was charged with having, on February 12, travelled from Penzance to Camborne, and from Truro to Camborne, without having paid fares, and with attempting to avoid payment of the same. He was fined in each case the full penalty of 40s. with costs—£7 8s. in all.

New Corn Exchange buildings are about to be erected in Manchester for a limited liability company. Messrs. Potts, Son, and Pickup, 2, Victoria Buildings, Manchester, are the architects.

Messrs. Atkinson Brothers, of Newcastle-on-Tyne, have been commissioned to execute a large stained-glass window for Holy Trinity Church, Windsor. The subject selected is "The Ascension."

The workshops and stores of Messrs. G. S. Lucraft and Sons, cabinet-makers, in Leonard-street, Finsbury, were partially destroyed by fire on the night of Wednesday week. The main building of three floors, 65ft. by 55ft., was burned out down to the first floor.

### TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 392, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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### ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

### SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

### NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—L. F. T.—E. Butler.—R. J. and Co.—F. W.

### "BUILDING NEWS" DESIGNING CLUB.

#### SEVENTH LIST OF SUBJECTS.

H.—A small branch Bank in a country town, on a site in the main street, having a frontage of 30ft. with a depth of 80ft., a right of way existing at the rear. The accommodation to include a residence for the manager. On the ground floor a public office, 25ft. wide by about 21ft. deep, or of equal area, to be provided, inclusive of the public space in front of the counter, which latter is reckoned as 4ft. in width. A small manager's office, with waiting-lobby attached, and a little strong room, inclosed by 2ft. walls. On the first floor the living-rooms of the manager's house to be located; the kitchen and offices may either be on the upper floor or be contrived level with the dining-room. There are in either case to be four bedrooms, with bathroom and w.c. A coal-cellar to be provided at the rear, and a clerks' w.c. and lavatory to be contrived on the ground floor. The elevation to be in stone on the ground floor, and brick with stone dressings above. Adjoining premises 25ft. high to top of parapet. The building frontage is level with the inner pavement line, and faces south; the site is a level one. Scale, 8ft. to the inch for the buildings; a block plan to a smaller scale will suffice to show the yard at back if desired. A good view of the façade is necessary, and sufficient drawings to illustrate the design.

DRAWINGS RECEIVED.—"Giles," "Una," "Fac et Spera," "Boer," "Thistle," "Pantile," "Tadpole," "Koh-i-noor."

## Correspondence.

### A DISCLAIMER.

To the Editor of the BUILDING NEWS.

SIR,—In a paragraph of the BUILDING NEWS of April 3 inst. my name appears in a list of gentlemen who are willing to receive men and boys as apprentices in their workshops, provided the necessary fees are forthcoming, in connection with the Home Arts and Industries Association. I have no workshop except my office, and am not prepared to do anything of the sort. I should be much obliged if you would kindly insert this contradiction in your next issue.—I am, &c.,

REGINALD BLOMFIELD.

Point Hill, Playden, Sussex.

[We simply quoted from the official report, page 3, and as to this there can be no mistake.—Ed. "B.N."]

## Intercommunication.

### QUESTIONS.

[11495.]—**Nash's Water-Colours.**—Can any reader kindly give a list of Nash's principal water-colour drawings of architectural subjects, or furnish a reference to any book where such a list may be found? I have an original water-colour of Bramhall, near Stockport, signed and dated 1841, and would like to know whether other copies of the same drawing exist. I have also several coloured lithos. of interiors by Nash, and would like to know where the originals are, if the information is published.—W. T. O.

### REPLIES.

[11487.]—**Bakery.**—There are no books illustrating bakeries beyond the catalogues of manufacturers of bakers' ovens and machinery, and these seldom contain anything like general information. The fact is, the special requirements of every case vary according to (1) capacity of proposed bakery; (2) class of trade—i.e., whether wholesale or retail; (3) site, and other local considerations; and (4) systems of baking, and whether dough made by hand, or machinery employed, &c. All these considerations affect the design so much, that suggestive plans would be of little service. It may be taken, however, that ovens in England (in Ireland or Scotland large single-deck ovens are used, owing to the system of setting batches piecework) should not be larger than 10ft. by 8ft. inside measure, and allow 21ft. wall round this. That they may either be single or double-deckers. If in a row, they must be fired in front or behind, or from a cellar underneath (if one or two only, they may be fired at the side. 50ft. super. will bake a 280lb. sack of flour into cottage bread on each deck, and three or four times a day ovens may be conveniently filled. Thus a two-deck oven 10ft. by 8ft. will bake conveniently 10 to 12 sacks per day, or 60 to 70 sacks per week. Bakery should be at least 10ft. high, and have a red Staffordshire tile floor, and with oven, and concrete floor for loft above. A cement-concrete floor may be used for ground floor if three months can be given for cement to slowly set before fires are lighted; but this often cannot be done, and even then hard tiles are the best, as being cheerful in colour, and less slippery than cement. In a large machine-bakery the ovens are placed side by side in a range, and 20ft. in front allowed for working. Windows in wall opposite ovens—an important point to keep in view, as skylights or side-lights baffle the operator. There should be no pillars. Of course, in a small hand-bakery, you put in the ovens and give all the space you can, at least enough to work the peel. If very contracted—say, 12ft. by 12ft.—dough is often made above. A confectioner requires a lot of room, if he can get it. There are a number of bakery engineers who pay the greatest attention to inquiries from architects and others, and submit sketch-plans if an opportunity is offered for tendering. It is well, also, to consult a practical baker, though not to be entirely guided by him, for he will be sure to favour his own system, and that may not be the best. Messrs. Joseph Baker and Sons, City-road, London; W. F. Mason and Co., Lens-sight, Manchester; Messrs. Werner, Plüderer and Co., Queen Victoria-street, London, are good firms of bakery engineers, and would supply catalogues and prices; or your correspondent may write to me for mine, or others advertising in the provokingly many and much-alike bakers' journals of the present day.—F. P. TUNKS, Bakery Engineer, Willesden, London.

Mr. Andrew J. Post, the senior partner of the firm of Post and McCord, engineers and contractors for bridges and other ironwork, died a fortnight ago at his home in Jersey City, at an advanced age. Mr. Post was born in Montpelier, Vermont. His father, Mr. Simon S. Post, was a well-known civil engineer.

Mr. Robert James Platt, for many years a leading official in the architects' office of the Midland Railway Company at Derby, died very suddenly last week, aged 54 years. At the inquest, it was shown that death resulted from apoplexy.

A massive jewelled altar cross and vases have been presented to Ripon Cathedral in memory of the late Mrs. Bickersteth, wife of Bishop Bickersteth, and these were dedicated at the Easter Eve service. The cross, which occupies the centre of the Communion-table, bears on the front a shield upon which is the Agnus Dei. At the back of the cross is a dedicatory inscription.

New Church of England schools at Parr, near St. Helen's, have just been opened by the Bishop of Liverpool. The building, which accommodates 300 children, has been built from plans by Mr. P. Ball, of Blackrock, Mr. William Molyneux having been the contractor.

The new town-hall and municipal offices were opened at Llanelly on Tuesday week. The buildings occupy a commanding situation on a portion of the People's Park. They have been erected from the designs of Mr. William Griffiths, architect, Llanelly, by Mr. T. P. Jones, contractor.

The Lodge Greenock St. John's have selected plans for a new Masonic temple to be erected in West Stewart-street, Greenock, at a cost of about £4,000.

The Elginshire road board decided, at their last meeting, to raise the salary of Mr. Hogg, their surveyor, from £200 to £250 a year, with an allowance as at present of £70 for travelling expenses. The county has a road mileage of 472, demanding an expenditure of £5,600 a year.



## Legal.

### FITNESS OF AN UMPIRE.

**SURVEYORS** of high standing and large practice are frequently employed to make reports and give evidence as to the value of lands and properties by railway companies and other clients, while they are also frequently engaged as arbitrators or as umpires in cases wherein the interests of their clients may be involved. It is of course of the highest importance that such an umpire especially should be free from bias to the one side or the other upon any arbitration that may come before him, and should, if possible, be wholly independent of the parties involved. Yet practically, and in business life, it cannot be expected that an eminent architect or surveyor should refuse to act for clients in other matters merely because he has been chosen umpire in one dispute wherein their interests were concerned. Each matter must, of course, depend upon its own facts; but the principle involved in a recent case (*Times*, 27th March) is of much importance to the profession. It arose in the case of an arbitration between the owner of land and the London and North Western and the Great Western Railway Companies, and in which Mr. John Cross, a well-known surveyor of Manchester, had been chosen umpire. He acted as such, and made his award; but the claimant had since found out that after his appointment as umpire, and before making the award, Mr. Cross had been retained by the same railway companies to value land in some other arbitration, and had, in fact, given his evidence in their behalf. The land owner accordingly now came to the High Court asking that his award should be set aside on the ground that the umpire had not been disinterested and independent in the matter.

Justices Day and Wright, however, refused to interfere, the former judge observing that the fact of a surveyor giving evidence for one party in regard to land which was the subject of a different arbitration, was no reason why he should not be an impartial umpire as between the parties upon a different claim. He also added that it would be difficult to elect an eminent surveyor as umpire who had not been concerned for the railway company at some time or other. Mr. Justice Wright was more doubtful; but he held that as there was no suggestion of interest, and as bias had not been shown, the motion to set aside the award would be dismissed with costs. The Court in fact refused to adopt the view put forth that under such circumstances there must be an unconscious bias, which of itself caused unfitness for the judicial office of umpire, and as the claimant had unwisely alleged misconduct, they gave Mr. Cross his costs of appearing to defend his character.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

**L. L.—ARCHITECT.—ASSISTANT.—COMMISSION.**—You would only appear to be entitled to commission upon the work completed, or for which he was paid.

**A. A.—ARCHITECT.—NEGLECT.—LIABILITY.**—If the fault was in your construction, you would probably be held liable, but if in bad workmanship, it would be a question of fact as to how far you neglected your duty of superintendence, and occasioned the defect.

**E. W.—LIGHT.—GREENHOUSE.—BAKHOUSE.**—(1) As to this, I cannot find the case in any ordinary report; but I do not think light to a greenhouse comes within the Act. (2) I consider that you are right in saying that the clause means entirely, or at least substantially, underground.

The City and South London Railway Company and the chairman of the committee formed for the purpose of preserving the church of St. Mary Woolnoth are arranging terms by which the safety of the church will be insured. The scheme is to construct a railway station under the church, the exit being provided for by a small building in the churchyard.

At the Glasgow Dean of Guild Court last week, William Orr, sole partner of the Fireproof Building Company, appeared in answer to a summons to explain why he had deviated from the plans passed by the Court for the erection of a building in Garraute-lane. The explanation offered was that the plan had not been followed by the workmen. The Court ordered him to carry out certain alterations so as to comply with the plans and also fined him £5.

### LEGAL INTELLIGENCE.

**THE CORK MUNICIPAL BUILDINGS CONTRACT.**—A "LUDICROUS VERDICT."—An action, which occupied Justice O'Brien and a special jury at Cork Assizes for a week, closed on Saturday evening. The Cork Corporation sued a member of their own body, Alderman Edward Fitzgerald, the contractor for building additional wings to the municipal buildings, and Mr. Michael Joseph M'Mullen, the city engineer, claiming £8,000 damages against Alderman Fitzgerald for a breach of contract entered upon in June, 1890, and a like sum of £8,000 damages against Mr. M'Mullen, through his negligence and unskillfulness as architect in superintending the execution of the work by Alderman Fitzgerald. Evidence was given to the effect that the concrete footings and foundations put in were not according to specification, and several defects in the structure existed, a number of engineers expressing the opinion that the work will have to be rebuilt. Alderman Fitzgerald was a member of the Council, and took part in the discussions which resulted in the decision to build the new wings; but the day before tenders were invited he resigned his seat, put in a tender for £10,000 (the city engineer's estimate being for £7,500), and after some reduction of the quantities, was declared contractor at £8,000. When the work was finished he returned to the Council, and some time after directed the attention of the town council to the dangerous condition of the building. Examination by Messrs. R. Walker and W. H. Hill, of Cork, showed a number of defects, one amusing detail being that the ventilator to the public health office was a dummy apparatus, which was blocked up between the ceiling and floor above. Disputes arose, and the matter went to arbitration, the town clerk suggesting the names of Mr. Robert Walker, past president of the Society of Architects, or Mr. S. F. Hynes; but eventually Mr. J. J. O'Callaghan, F.R.I.A.I., was appointed, and awarded Mr. Fitzgerald £467 in extras beyond the £8,000 named in the contract. The jury were in deliberation on Saturday for four hours, and returned to court a number of times saying they could not agree. His Lordship said if he appealed in vain to their sense of propriety and honour he should try what remedy there was in constraint. Eventually the jury found that the work was not executed in a workmanlike manner nor in conformity with the plans and specifications; that it was not executed to the satisfaction of the engineer; that Alderman Fitzgerald was guilty of misrepresentation; and that the engineer did not act with reasonable and proper diligence. They awarded sixpence damages against Alderman Fitzgerald and found that £1 lodged in court by Mr. M'Mullen was sufficient. They added: "The irregular manner in which the Corporation acted in giving the contract to Alderman Fitzgerald has, in our opinion, disentitled them to substantial damages." Counsel for the corporation intimated that they would take other steps. His lordship said it was a ludicrous verdict.

**ALLEGED MISREPRESENTATION AS TO A PARTNERSHIP.**—At Eastbourne County-court, on March 31st, his Honour Judge Martineau and a jury partly heard the action Gardner v. Jose, in which Elizabeth Ballard Gardner, administratrix of the late Henry Gardner, a house decorator, claimed from John Oates Jose £50, balance of £100 which defendant agreed to pay for a partnership in a business carried on by the late Henry Gardner. Jose refused to pay because he alleged that he was induced to enter into the agreement by false and fraudulent representations made to him by Gardner, who was a house decorator. In January an advertisement was inserted in a local paper, as follows:—"Wanted, young man as partner, in house decorating business, good trade, small premium required." Jose wrote from London to Gardner, who replied that he had done £900 worth of business in two years, and there were no bad debts, whilst after paying everything there was a profit of £230. Gardner showed him a list purporting to have been work done in 1893 and 1894; but, upon investigation, Jose found that the items had been grossly misrepresented. There was a counter-claim for £50, which had been paid. John Oates Jose, a builder, said he replied to an advertisement, and afterwards saw Gardner on January 19th. Gardner produced a list, which he said showed the names of customers and work done in 1893 and 1894, and said he had a good business and more work than he could attend to himself, and was desirous of having a working partner. Witness asked how many men he employed at a time, and he replied two only. There was plenty of work as soon as the partnership was agreed upon. He produced two estimates for work, which he said had been accepted, but the works were carried out by other firms. About the beginning of February he came to work, but there was very little to do. Mr. Gardner died on March 4th, and witness then made inquiries about the business, and compared the items with the books. One month's work while he was there only amounted to £14, and the estimates which Gardner said had been accepted were never carried out. After the death of Gardner his solicitor wrote offering £15 in settle-

ment of the claim. He had been carrying on the business since under Gardner's name. David Allum, plumber, said he had gone through the list of work done in 1893 and 1894, and as to about £470, this was for work done by Gardner for witness. Witness sub-let the work to Gardner. Cross-examined: Gardner was a good workman. Councillor Breach, builder and decorator, said in 1894 for work and material he had paid £33 2s. 7d. to Gardner. Henry Hutchings, secretary Willingdon Cricket Club, said in 1893 and 1894 he did not pay £40 and 15s. respectively to Gardner for work done. He, however, had paid three sums in 1893 of £4, £5, and £3 10s. as umpire's fees, in which capacity Gardner acted. For plaintiff it was said Jose had no right to carry on the business as he was now doing in Mr. Gardner's name. As to the alleged misrepresentation, there was no complaint of this until March 30; plaintiff did not even complain to the widow when the accounts were being made out; but he quietly complained to Mr. Champion, who had then become solicitor to the defendant. The letter of January 14 stated as regards the business: "I have done nearly £900 in the last two years." This showed that Gardner had done nearly £900 worth of work; it was not that he had been paid such an amount. Rufus Gardner, who assisted his father in his business for three years, produced receipts for £47 out of £85 in the list, but he could account for work which was done amounting to £37, which was not stated. His father sometimes sub-let work. The £40 for work done for the Willingdon Cricket Club was for umpiring. The case was adjourned until April 16.

**THE CENTRAL LONDON RAILWAY TERMINUS AT SHEPHERD'S BUSH.**—Mr. Under-Sheriff Burchell and a special jury were investigating on Wednesday and Thursday in last week, at the Sheriff's Court, a claim by the Kensington Woodhouse Park Syndicate (Limited) against the Central London Railway Company for £32,790 as compensation for the compulsory acquisition of their estate of about ten acres at Shepherd's Bush, which the company require as a terminal and generating station for the new underground line which they are about to construct from Shepherd's Bush to the City. The plaintiffs allege that the estate is of exceptional value for exhibition purposes, while for the defendants evidence was called to show that large sums of money have been lost on West-end exhibitions. Mr. T. J. Wyatt, managing director of the Woodhouse Park Syndicate, stated that he originally bought the estate, which covered ten acres, from the Park and Gardens Company for £4,500, and sold it to the present syndicate at a premium of £1,000. The grounds were afterwards let to Major Walleat, at an annual rental of £1,000 and a percentage on the takings. In cross-examination the witness admitted that none of the Earl's Court exhibitions had paid a penny profit. Alderman Sir J. Whittaker Ellis, Bart., gave evidence as to the value of the property, which, he said, was situated in a unique position for the holding of exhibitions. For building purposes the estate was also very valuable. Mr. Freeman, on behalf of the railway company, said the whole of the ten acres would be required for their terminus and generating station. Mr. J. Hart, the secretary of the Empire of India and other exhibitions, said that he considered Woodhouse Park totally unsuitable for the purpose of an exhibition ground. Mr. Alfred Johnstone, the accountant of the Earl's Court exhibitions, said that the result of Buffalo Bill's Exhibition was a loss of £70,000, the Italian Exhibition resulted in a loss of £8,000, the Spanish of £20,000, the French of £20,000, and the German of £25,000. During 1890 and 1891 the exhibitions were financed by the District Railway Company. The inquiry was adjourned till Saturday, the 18th inst.

**A HARROGATE ARBITRATION.**—The proceedings relative to assessing the value of the land which the North-Eastern Railway Company propose to take for the purposes of a new goods station and coal depot at Harrogate, took place on Tuesday, Wednesday, and Thursday in last week at the Queen's Hotel, in that town. The land consists of about 6½ acres of the Dragon Estate, belonging to Mrs. Cunliffe, of Liverpool, and adjoins the passenger station. Mr. Thomas Gow, of Cambo, Northumberland, was the umpire; Mr. John Hepper, of Leeds, was the arbitrator for the railway company; and Mr. Thomas Fenwick, of Leeds, arbitrator for the owner of the property. For the claimant, Mr. Raymont, builder, of Harrogate, gave evidence as to the depreciation that would be caused by a goods station. Mr. George Renton, auctioneer, Harrogate, valued the land at £13,815, and the depreciation of the remainder at £11,885, making a total of £25,700. Mr. Ernest Powell gave for land and depreciation, £25,468. Mr. J. W. Heeles, estate agent, Leeds, put the value of the land at £13,853, and the depreciation at £11,747, making a total of £25,600. Mr. Woodhead, C.E., Bradford, valued the land at £13,815 2s. 6d., and the depreciation at £10,147 2s. 6d.—total, £25,962 5s. Mr. Thomas Wainwright, auctioneer and surveyor, Liverpool, gave £13,947 for the land, and £9,932 for depreciation—£23,879. Mr. Copper-



thwaite, engineer to the railway company, gave evidence as to the construction of the proposed goods station and coal depot. Mr. Valentine Fowler, actioneer, of Scarborough, considered that a goods station and coal depot would be an advantage rather than a disadvantage to the rest of the land, which is laid out for residential purposes. Mr. Thomas Ambler valued the land to be taken at 4s. 3½d. per yard, or a total of £6,766 3s. 6d. The cost of the new approaches occasioned by the severance he put at £1,404 8s. 10d., making in all £8,170 12s. 4d. Mr. Milnes, architect, Bradford, valued the land at £8,763, and estimated the cost of the new approaches at £1,845 16s. 9d. Mr. E. J. Fawcett, surveyor, Leeds, put the value of the land at £8,175 10s. 4d., and the cost of the new approaches at £1,355 5s., making a total £9,530 15s. 4d. Mr. Thomas Winn, surveyor, Leeds, valued the land at 4s. 7d. per yard, or a total of £7,241 10s. 6d. The cost of the new approaches he put at £1,615 6s., making £8,856 16s. 6d. in all. The arbitrators and the umpire will meet at York to consider their award.

### CHIPS.

In consequence of the increase of business in the South Wales district, the Yost Typewriter Company, Limited, have found it necessary to establish a branch at 77, St. Mary-street, Cardiff. The office occupies a prominent central position, and will be adequately stocked with Yost typewriters and supplies.

New infirmary wards are approaching completion at the workhouse at Knaresborough from designs prepared by Mr. Marshall, of Harrogate. The cost will be about £3,000.

A new workhouse infirmary at Walsall was opened last week. It consists of two blocks, each two stories in height, of 28 beds each, and two isolation wards, with central administrative block. The walls are of red brick, with stone dressings, and the outlay has been £7,000. Mr. H. E. Lavender, of Walsall, was the architect, and Mr. A. Lyne, of the same town, the contractor.

At Paisley Dean of Guild Court, on April 2nd, plans were passed of a new thread-twisting mill to be erected by Messrs. Clark and Co., Anchor Thread Mills, in extension of their works at Paisley. The building is to be six stories high, and will contain about 50,000 spindles.

The rural district council of Meriden have elected Mr. Bretherton, at present the sanitary inspector for the district, as their surveyor, raising his salary from £145 to £240 a year.

The Duke of Westminster is giving windows for the north and south ends of the transepts of St. Paul's Cathedral. It is proposed to place in one window the kings of the several kingdoms of the Heptarchy in whose time Christianity was introduced, or restored after lapse; and in the other the Bishops or Archbishops under whom the new faith was introduced or restored. The only addition to these will be Archbishop Theodore of Canterbury.

Messrs. J. Kershaw and Co., of 38A, King William-street, London Bridge, have, we understand, purchased the British and foreign patent rights in Moore's universal carving machine, and are now offering it at a greatly reduced price to builders. They will be pleased to receive inquiries with the view to an extended sale.

Although the approach of the holidays exercised some influence on the supply of properties at the Auction Mart last week, a considerable number of sales were held, and the results were successful, the aggregate of business transactions, amounting to £63,778, being much beyond the average of other years for the week preceding Easter.

A memorial porch has been completed at the entrance to Hawarden Church, in memory of the late Mr. William Henry Gladstone, eldest son of Mr. and Mrs. Gladstone. A figure of the Good Shepherd occupies a niche above the entrance, and on either side are angels carved in relief. Beneath these figures are placed the words, "Holiness to the Lord."

The railway from Constantinople to Salonica, part of which, as far as Dedegatch, has long been open, is now finished in its whole length, and has been opened for traffic this week.

The chairman of the East London Waterworks Company, at the half-yearly meeting, stated that the frost of last year had cost the company £24,000, and the drought which followed was responsible for an increase of nearly £12,000 in the expenditure. The "persecution" to which the London County Council had subjected them had also cost the company £4,400 in protecting themselves from aggression and injustice.

There has just been erected in North Bute parish church, as a memorial, a stained-glass window, the subject being the "Resurrection and Ascension of Christ." The window is from the studio of Messrs. Messrs. William Meikle and Son, Glasgow.

### WATER SUPPLY AND SANITARY MATTERS.

GULLANE, N.B.—The formal opening of the new waterworks supplying Gullane took place on Tuesday. The supply is obtained partly from a deep bore and partly from a well on the level at the foot of Whim Hill. Constructed to a depth of 110ft., the well is 6ft. in diameter at the surface and for 30ft. down. It then widens out to 8ft. in diameter at 60ft. from the surface, and from this point to the bottom for a distance of 50ft. the diameter is 8ft. The well is lined with brick and cement from the surface to the solid rock, 32ft. down, so as to exclude all surface water. From below the rock for a depth of 40ft. it is sunk through fireclay and blaes, in which almost no water is obtained, and which had also to be lined with brick and cement. At a depth of 80ft. from the surface the water-bearing strata, consisting of freestone, are encountered. Adjoining is a bore 4in. in diameter and 200ft. in depth, connected with the well by means of a mine, 25ft. in length by 5ft. in height, and 4ft. in breadth. The yield of water is about 50 gallons per minute, equal to a supply of 25 gallons per head for a population of 2,880. A storage tank has been constructed on the top of the Whim Hill, and in the whinstone rock below the surface of the ground, 70ft. in length by 24ft. in breadth by 10ft. in depth. The tank contains 100,000 gallons of water. From this storage tank, at a height of 120ft. above the mouth of the well, the water will flow by gravitation through the whole of the Special Water Supply district. The cost of the works amounts to about £2,500. Messrs. Belfrage and Carfrae, C.E., 1, Erskine-place, Edinburgh, are the engineers, and the contractors are: Mr. Robert Henderson, well-sinker, Edinburgh; Messrs. James Milne and Son, Limited, engineers and brassfounders, Edinburgh; Messrs. Priestman Brothers, Limited, Hull; Messrs. D. Purves and Co., plumbers, Edinburgh; and Mr. Jas. Kendall, plumber, North Berwick.

HUDDESFIELD.—Two new reservoirs are being constructed, for the Huddersfield Corporation, in the Wessenden Valley, and when completed are expected to provide for the wants of the district supplied, containing a population of 150,000, for twenty years. The two additional reservoirs are called Butterley and Blakeley. The larger or Butterley reservoir, which is now nearing completion, is formed by an embankment placed upon the site of Upper Bank Bottom Mills, at the lower end of the Wessenden Valley, the top of which is 11ft. above the bed of the stream. The capacity will be 400 million gallons, the surface area will be 43 acres, and the greatest depth of water will be 98ft. 6in. As soon as this reservoir is completed, the two high-level reservoirs situate higher up the valley will be utilised for domestic supply, and compensation water will be turned out of the Butterley reservoir in respect of the whole of the Wessenden Valley, namely, 2,258,640 gallons per working day. One or two engineering difficulties have been met with at Butterley. In 1894, when the excavation of the puddle trench had been carried down to a thick bed of hard shale 80ft. below the Wessenden Brook, it was thought that a satisfactory foundation had been reached; but examination showed the shale to contain fissures in several places, whereby water would freely escape. In order to secure a water-tight foundation, the excavation was continued into the shale to a depth varying from 10ft. to 3ft. before all the fissures disappeared. The excavation of this shale, which is of extreme hardness, was very slow and tedious, as no explosive could be used without running a risk of shaking and damaging the foundation. The total depth of the excavation is—at the Binn end 220ft., at the Hard end 223ft., and at the lowest part of the trench in the centre of the valley 209ft. below the level of the top water of the reservoir. In November of last year trial pits and borings were being made on the site of the proposed Blakeley, in order to prove the strata, and over 200 men were employed at the works. Last year, a Bill, having for its chief object an extension of the time for the completion of Blakeley reservoir, was successfully passed through Parliament. Up to March of 1895 no less than £1,049,162 had been expended on the works at the two reservoirs; this sum including the cost of the new water-mains, both inside and outside the borough. The net income for water for the year ended March 31st, 1895, was £46,811 16s. 7d., and the profit on the department amounted to £839 19s. 2d. This profit, however, will be far exceeded next year; and in the total estimates for 1896-7, the profit from the waterworks is put down at £2,500. The whole of the water supply is obtained by gravitation, and the drainage area of all the Huddersfield reservoirs is chiefly moorland or high mountain pasture, and the millstone-grit formation. The engineers for the works at Butterley and Blakeley are—Messrs. T. and C. Hawksley, London; and Messrs. G. and G. H. Crowther, Huddersfield.

NOTTINGHAM.—On Tuesday week an inquiry was opened at the Guildhall, Nottingham, as to an application made by the corporation to the Local Government Board for the issue of a provisional order so as to include within the limits within which

the corporation shall be empowered to supply water, seven rural parishes in the county. The inquiry closed on Thursday afternoon. A keen interest was shown in the proceedings, mainly by certain land-owners and several public authorities acting in opposition to the application of the Nottingham Corporation, who, on the other hand, have the support of the inhabitants of the villages and the parish councils who will reap the benefits to be derived from an improved water supply brought into their homes, and for the use of their cattle. The scheme has been prepared by Mr. D. M. F. Gaskin, water engineer to the corporation, based on a report by the late Mr. Thomas Hawksley, and the estimated outlay if sanctioned would be about £150,000.

PREVENTION OF RIVER POLLUTION IN THE MERSEY AND IRWELL WATERSHED.—Mr. R. A. Tatton, M.I.C.E., has reported to the Mersey and Irwell Joint Committee on the work which is being done for the prevention of river pollution in the Mersey and Irwell watershed. The population of the district is 2,191,319, and the rateable value £9,731,008. The number of works is 394. The system of disposing of cinders from factories, either by tipping them direct into the river or by depositing them on the banks to be washed away by the first flood, has been practically stopped, and the river beds are much improved in consequence. The dredgings from the Ship Canal, into which these solids eventually find their way, now contain hardly any cinders whereas formerly they were chiefly composed of them. The sending forward down the stream the solid sludge which has been brought down the stream and collected in the mill lodges has also been stopped. The progress made by manufacturers has been greater, as far as results are concerned, than that made by local authorities, those rivers which are principally polluted by sewage showing less improvement than those in which manufacturing pollution forms a larger proportion. A comparison between the Mersey and the Irwell shows this in a marked degree, the former, with a population of 633,493 and only 60 manufactories, showing little or no improvement, whereas the Irwell, with a population of 988,625 and 272 manufactories, is decidedly purer, and many of the tributaries which used to be very foul are now in fair order. There seems, therefore, no reason to doubt that when the sewage pollution has been removed the condition of the rivers will be very different to what it is now.

The partnership heretofore subsisting between M. N. Inman and A. B. Jackson, architects and surveyors, Bedford-row, W.C., under the style of Inman and Jackson, has been dissolved; as has also the partnership between W. J. Gardiner, E. J. Gardiner, and H. W. D. Theobald, surveyors, Great Russell-street, W.C., under the style of Gardiner, Son, and Theobald, and Gardiner and Theobalds.

The new additions to the Burntwood Asylum, near Lichfield, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A contract has been let for restoring the parish church of Poundstock, near Stratton, North Cornwall, at a cost of £2,200. The walls will be partly rebuilt, a new roof and new windows provided.

The deepening of the Hudson River to 12ft., as far as the State dam, seven miles above Albany, will probably be completed within the next two years. The improvement projected and being carried out by the Federal Government calls for a channel 12ft. deep and 400ft. wide at the foot of Broadway, in Troy, and a channel 300ft. wide, but of the same depth, to the State dam, at the head of navigation. The contracts for this work, let in 1893, cover the removal of 4,620,000 cubic yards of earth and 190,000 tons of rock, and the building of eight miles of dykes. The estimated cost is £500,000 sterling.

Mr. Rienzi Walton, C.E., one of the inspectors of the Local Government Board, was engaged during the whole of Thursday in last week at the town hall, Rhyl, in the hearing of an application by the Rhyl Urban District Council for sanction to a loan of £2,700 for the purpose of acquiring the site of the Royal Alexandra Hospital. The land is required for the improvement of the promenade, and also because the lodging-house keepers in the vicinity object to the presence on the sea-front of a hospital.

The church of St. Wilfrid, Metheringham, which has been undergoing considerable improvement and alteration, was reopened by the Bishop of Lincoln on Thursday in last week. The church was restored in 1859, and the north aisle built in 1870. A new pitch-pine roof, septangular in form, with Perpendicular carved bosses at the intersections, a new three-light window (a copy of 14th-century work), and organ chamber have been added to the chancel, and the old east-end window put in the south side of the chancel. The architect was Mr. H. Kirk, Sleaford, and the contractors were Messrs. Greenwood and Son, Metheringham.



## Our Office Table.

THE Arts Committee of the Manchester Corporation have brought together a collection of architectural drawings at their City Art Gallery. The exhibition was opened to the public on Monday. The works on view include some of the designs submitted in the Manchester Town Hall competition. The powerful Byzantine design by Mr. William Emerson, to which the first premium in the Liverpool Cathedral competition was awarded by the late Mr. Ewan Christian ten years ago (and fully illustrated by us at that time) is prominently hung. Mr. James Brooks sends several perspectives of churches and houses erected from his designs. Messrs. Ernest George and Peto illustrate one of their mansions. Messrs. Woodhouse and Willoughby, of Manchester, show by an effective drawing their new technical school for that city. Other noteworthy exhibitors are Messrs. Leonard Stokes, W. H. Brewer, J. A. Gotch, F. W. Mee, and Darbishire and Smith.

A FINE art, industrial, and maritime exhibition will be opened in Cathays Park, Cardiff, on Saturday, May 2nd, with every promise of success. The guarantee fund, irrespective of donations, amounts to £21,000. The expenditure by the council for buildings, grounds, &c., will amount to between £25,000 and £30,000, and a further sum of over £20,000 will be expended upon accessories in the shape of a lake and canal, a water show, mimic naval battles, cycle track, "Old Cardiff," Indian Bazaar, &c., by a syndicate. The exhibition will be illustrative of the fine arts, marine architecture, coal-mining, gold-mining, mechanical engineering, and electrical engineering, and will be an emphatically educative exhibition. Its site is close to the centre of the town. The architect is Mr. Edwin Seward, R.C.A., of Cardiff, and the main building will cover an area of 250ft. by 80ft. The grounds are being planted with shrubs and palms, under the personal supervision of Mr. W. Pettigrew, head gardener to the Marquis of Bute.

A PAPER on "Domestic Hot-Water Distribution and Kitchen-Boiler Explosions" was read on Thursday evening in last week before the Glasgow Philosophical Society by Mr. David Fulton, lecturer on plumbing in the Technical College. Mr. Fulton dealt at the outset with the various methods of hot-water circulation, and expressed himself as most in favour of the cylinder system practised in Glasgow. Speaking of the effects of frost, he pointed out that a short sharp frost, especially if accompanied by a north-east wind, was more likely to lead to boiler explosions than a continuous frost without wind. To illustrate this, he stated that from January 5 to January 9, 1894, there were 40 kitchen or heating-boiler explosions in the United Kingdom. Twelve persons were killed and thirty injured. In the continuous frost of last year the record from January 1 to February 17 was 11 killed and 56 injured from kitchen-boiler explosions. The fact that most of the hot-water pipes were in garrets, and generally unprotected, accounted for the evil effect of the cold wind, which got under the eaves of houses, and soon froze the pipes. In his opinion, the popular theories that explosions were due to the sudden generation of steam caused by cold water rushing into a heated boiler, or the presence of some highly explosive unknown gas suddenly generated in the boiler, were fallacious. The result of many practical experiments showed clearly that before a kitchen boiler could explode with disastrous effects, it must contain water as well as steam, and that the force of the explosion would be in proportion to the quantity and temperature of the water in the boiler immediately before the rupture took place. The fixing of a safety-valve to the boiler, it had been shown, proved thoroughly efficient as a preventive to explosions.

THE annual conference of the Amalgamated Union of Upholsterers was opened in the Victoria Inn, John Bright-street, Birmingham, on Monday, under the presidency of Mr. Alexander McKee, of Belfast. Delegates were present representing over 2,000 members in London, Dublin, Belfast, Glasgow, Edinburgh, Aberdeen, Manchester, Liverpool, Newcastle, Birmingham, and other centres. Mr. H. Simmonds, president of the Birmingham branch, gave a hearty welcome to the delegates, which was acknowledged by the president of the Union, who then delivered his annual address. Mr. McKee referred to the

satisfactory growth of the amalgamation by the formation of new branches in populous centres, and also dwelt upon the advantages of trades-unionism. Mr. S. Beckley, of Manchester (general secretary), submitted the annual balance-sheet, which showed that during the year new branches had been formed at Cardiff, Swansea, Inverness, and Sunderland, and that arrangements were being made for establishing branches at High Wycombe and Leicester. At Tuesday's conference proposals were agreed to for an amalgamation of the whole of the furnishing trade, and for dealing with the labour and wages question at Dublin, Belfast, and Newcastle-on-Tyne.

THE annual report of the Supervising Architect to the United States Treasury (Mr. William Martin Aiken), up to June 30, 1895, the end of the fiscal year, stated that no fewer than thirty public buildings, some authorised as far back as January, 1887, have not been begun, owing to the inadequacy of the architectural staff to cope with the increasing duties devolving upon them. The year's expenditure for the purchase of sites and the erection and repairs of public buildings amounted to £754,000 sterling. The office has now in charge 306 federal, or public, buildings, of which 24 were completed during the year, while 46 others are in course of erection, and eight others are being extensively repaired. The contract liabilities on works now in progress are about £550,000 sterling. The great majority of the buildings are post-offices, but custom houses, courthouses, and appraisers' warehouses are also represented. The report is illustrated by numerous perspectives of buildings rather more refined in character than of the usual American "Official" type.

CORK, in the raw and manufactured state, is the third most important of Spanish exports. The British Consul at Barcelona mentions that in the province of Gerona alone it is estimated that 198,000 acres are devoted to the cultivation of the cork trees, which produce about 20,000 tons valued at £1,610,000. The raw Catalan cork is not exported, as it requires to be worked in a special way, and the Catalans themselves appear to be the only workmen who are able to treat it properly. Prepared cork goes largely to British markets, notably to London, Dublin, and Edinburgh, and also to Bombay, Sydney, Melbourne, Montreal, and Quebec. The machinery for cork-cutting goes mainly from France, although some of the machines are of English manufacture, "and in this industry there is possibly an opening for British trade and enterprise, but only by the personal attendance of capable men who understand the business and come to seek orders and get them from principals. No amount of printed circulars for consular officers to distribute will be of any use."

At Tuesday's meeting of the Liverpool Select Vestry a long discussion took place on the report of a special committee of the vestry appointed to inquire into the subject of further workhouse accommodation. The committee recommended the vestry to purchase a new site, and to erect pavilions thereon; but this proposal was defeated. It was ultimately decided, in accordance with the report of Mr. Edmund Kirby, F.R.I.B.A., of Cook-street, Liverpool, whom the committee had consulted, to adapt the Kirkdale Buildings, and also to erect pavilions in front of the existing schools, to accommodate 1,800 inmates.

The Bexley Heath Railway Company appeared by counsel in the Queen's Bench Division last week to show cause against a rule calling upon them to build a bridge over, or a tunnel under, their line where a public footpath had crossed it. Counsel said that the company "had not a copper in the world," and if the directors were sent to gaol it was impossible for them to construct a bridge. The line was leased in perpetuity to the South-Eastern Railway Company for an amount which only sufficed to pay the interest on the debentures. Justices Day and Lawrence, however, held that the public could insist on their rights, and the mandamus was granted.

Mr. J. F. W. Dellow, formerly chairman of the St. George's-in-the-East Board of Guardians and the vestry for the district, appeared at the Thames Police-court, on Wednesday, to answer summonses taken out under the Public Bodies Corrupt Practices Act, for having unlawfully received gifts of money from two contractors—namely, a cheque for £10 from William Gibbs, granite merchant, Duke Stone Wharf, Limehouse, and another for £20 from Samuel More, linen draper, Paternoster-row—for the supply of articles to the workhouse. Some evidence having been given, the hearing was adjourned.

## MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Edinburgh Architectural Association. Visits to Pittreave House and Dunfermline Abbey and Palace. Train from Waverley Station 1.20 p.m.

Royal Institution. "The Vault of the Sistine Chapel," by W. B. Richmond, R.A. 3 p.m.

MONDAY.—Society of Engineers. "Water Supply of Small Towns and Rural Districts," by Percy Griffith, United Service Institution. 7.30 p.m.

Surveyors' Institution. Discussion on "The Conditions of Building Contracts." 8 p.m.

Society of Arts. "Precious Stones," by Professor Henry A. Miers, M.A. Cantor lecture No. 1. 8 p.m.

Liverpool Architectural Society. "Application of Electricity to Lighting and Power Purposes," by Thos. L. Miller. 6.30 p.m.

TUESDAY.—Institution of Civil Engineers. "The Thirlmere Works for the Water-Supply of Manchester," by G. H. Hill, M.Inst.C.E., and "The Vyrnwy Works for the Water-Supply of Liverpool," by G. F. Deacon, M.Inst.C.E. 8 p.m.

WEDNESDAY.—Society of Arts. "Early English Organ Writers," by Burnham Horner. 8 p.m.

## CHIPS.

At the meeting of the Cardiff Museum Committee, held at the town hall on Thursday evening in last week, Mr. Edwin Seward, R.S.A., submitted the plans and designs for the new corporation museum, and it was resolved that he should complete them, and otherwise prepare them for presentation to the museum building committee.

Messrs. Campbell Smith and Co., of Newman-street, W., and Gloucester-terrace, S.W., have been intrusted with the redecoration of the Vaudeville Theatre, in the Strand, under the superintendence of Mr. W. Barnard Pinhey, architect.

The laying of the foundation-stone of the Morton Hall by the donor, Mr. William Morton, of Birmingham, was the occasion of a popular demonstration at Newmillns, Ayrshire, on Saturday afternoon. The building has a central site in Main-street, adjoining the Lady Flora School, and will be used for lectures and concerts. The architect is Mr. Arthur Harrison, Birmingham, and the builders are Messrs. Matthew Muir and Co., Kilmarnock.

A Board of Trade inquiry was conducted at Dover, on Wednesday, by Sir E. Leader Williams, with reference to the proposed reclamation of the foreshore between Dover and St. Margaret's Bay, a distance of three miles. The Bill relating to the scheme has passed its second reading in Parliament. Evidence was given by Sir John Jackson, contractor, and by representatives of all the public bodies in Dover and the district, in favour of the scheme. There was no opposition. It is estimated that the work will cost nearly a quarter of a million, the scheme being to build a sea-wall which will reclaim and preserve the foreshore, and, at the same time, provide an undercliff marine drive, with building sites, between Dover and St. Margaret's.

Mr. Troutbeck held an inquest, on Wednesday, upon the body of John Sullivan, who was killed, and three other men injured, by the fall of a scaffold at Coburg-row, Westminster, on the 1st inst. It was shown that the scaffold was properly constructed of excellent materials, and was competent to carry a gross weight of five tons. But, owing to a sudden shock, caused by an iron mortar-skip striking the edge of the platform, the structure collapsed, and the men and material upon it were precipitated to the ground, a depth of about 40ft. The jury returned a verdict of accidental death, with a rider that the accident was caused by the "compo," contained in the skip coming out in a solid mass, and thus causing the scaffold to collapse. The coroner observed that he was sorry the jury had given a reason for their verdict.

Professor Petrie delivered, on Wednesday afternoon, at University College, a lecture on the results of his recent excavations in Egypt. Fresh explorations, he said, have been made in Thebes, resulting in important discoveries—a tomb of the Twelfth Dynasty, lined with funeral scenes, the sites of seven temples, interesting tablets with long inscriptions, and many other archaeological remains of much value. One of the inscriptions contained the first record yet discovered of a connection between Egypt and the people of Israel.

The committee appointed in 1892 to carry out the memorial in Winchester Cathedral to Bishop Harold Browne have now finished the work committed to them. It was decided that the memorial should be a recumbent effigy of the Bishop on an altar-tomb. Messrs. Bodley and Garner were appointed to design, and Messrs. Farmer and Brindley to execute, the work, which is now completed—the figure in alabaster, with mitre, cope, and pastoral staff, resting on a Purbeck marble slab, which is supported by a tomb of the same material, with niches containing small statues of Apostles, and bears around its edges an inscription engraved on brass.



## Trade News.

### WAGES MOVEMENTS.

**LONDON.**—The new code of working rules, drawn up by the London Building Trade Unions, has been submitted to the London branches and approved, and has since been forwarded to the Central Association of Master Builders. The chief points of difference between these rules and those which were signed in July, 1892, are as follows:—Rule 3 says that the present rate of wages for skilled mechanics and labourers shall be advanced one halfpenny an hour. Rule 5 provides that one hour's notice be given or one hour's time be paid by either side on determining an engagement. The old rule only stipulated that the employers should give notice or pay one hour's time in terminating an engagement. Rule 6 increases the amount payable to men sent into the country to 1s. per day as expenses. Rule 11 provides that three months' notice instead of six shall terminate the code of rules. The schedule of hours is unaltered.

**ABERDEEN.**—The Master Builders' Association had under consideration on Monday a communication from the men to the effect that unless their modified request for  $\frac{1}{4}$ d. per hour of advance in wages were granted, the question would be sent to arbitration on the ground of the original proposal for 1d. per hour of an increase. It was decided not to grant the advance of  $\frac{1}{4}$ d., but to allow the matter to be settled by arbitration as suggested.—A mass meeting of operative plumbers held on the same day declined an offer of the employers to refer the apprentices question to arbitration. At present the apprentices, after completing five years, are sent out as journeymen, and the operatives insist on the completion of the full period of seven years.—The master cabinetmakers sent a reply also on Monday, to a communication from the operatives, asking for an increase of wages and the adoption of by-laws, to the effect that it had been agreed to give an advance of  $\frac{1}{4}$ d. per hour to cabinet and chairmakers, and also an equivalent advance of  $7\frac{1}{2}$  per cent. to piece workers in these trades. In regard to the proposed by-laws, the masters stated that as the unwritten law of use and wont had been found to work satisfactorily, the adoption of these was considered unnecessary. The masters do not recognise that they have anything to do with woodcarvers, woodturners, and cabinet machinemen, and confine the advance to cabinet and chairmakers only.

**ARBROATH.**—Recently the Arbroath operative joiners applied to have their wages increased from 7d. to  $7\frac{1}{4}$ d. per hour. They have now received a reply that, owing to the state of trade, the Masters' Association do not see their way to grant the increase.

**DUNDEE.**—A strike took place among the joiners of Dundee on Monday, following the demand made by them to the effect that the by-laws put forward should be signed in their entirety, and that the wages be increased from 8d. to  $8\frac{1}{4}$ d. per hour. It is not expected that the strike will be of long duration, as 15 of the 49 leading masters have already granted the demands of their men, who have accordingly resumed work.

**HUDDERSFIELD.**—A month ago the builders' labourers of Huddersfield gave notice of a demand for an advance in their wages from 5d. to 6d. per hour. The employers offered  $\frac{1}{4}$ d. an hour increase; but at a meeting of the men it was decided to reject this offer and come out on strike. They therefore ceased work on Friday night, about 250 men being affected. The employers state that the giving of one month's notice is a violation of an arrangement, the rule having been that six months' notice should be given on either side regarding changes in the rate of wages. The employers offered  $\frac{1}{4}$ d. advance forthwith and  $\frac{1}{4}$ d. in July.

**LEEDS.**—A joint meeting of the members of the Leeds Master Builders' Association and the Leeds Builders' Exchange has been held in the arbitration room at the Royal Exchange, to consider the demand by the bricklayers and labourers for an advance of  $\frac{1}{4}$ d. per hour in the rate of wages, and the necessary alterations in the working rules. Bricklayers are now paid at the rate of  $8\frac{1}{2}$ d. per hour, and labourers 6d. per hour, and they gave six months' notice for an increase in their pay, which the bricklayers wish advanced to 9d. and the labourers to  $6\frac{1}{2}$ d. per hour. The notice expires on the 1st of May. There was a large attendance of employers, and Mr. W. Irwin, president of the Master Builders' Association, occupied the chair. The questions in dispute were discussed for about two hours, and the meeting then separated without any decision being arrived at, but a strong feeling was expressed against granting any concession. The subject will be further considered at a future meeting, the date of which has not yet been fixed.

**NEWCASTLE AND GATESHEAD.**—The arbitration proposed by the Operative Stonemasons' Society of Newcastle and Gateshead is likely to lead to a settlement of the trade dispute between the

plasterers and the bricklayers and the withdrawal of the lock-out by the employers. The proposal is for one man to be selected by the locked-out trades, one by the employers, and a third by the locked-out trades and the employers; their decision to be final, and the men to resume work at once.

### CHIPS.

New board schools have just been completed at Keith, N.B., at a cost of £2,100, from plans by Mr. Robertson, of that town.

The Queen has contributed £150 to the repair of the cloisters, chapter-house, and crypt of the Canterbury Cathedral, in commemoration of the 1,300th anniversary of the baptism of King Ethelbert at Canterbury. Although the appeal has not been publicly issued, numerous and liberal contributions have already been received from the Dean and Chapter and various residents in East Kent.

The new town-hall and municipal offices at Llanelli were opened on Tuesday week. The building occupies a commanding situation on a portion of the People's Park. It has been erected from the designs of Mr. William Griffiths, architect, Llanelli, by Mr. P. T. Jones, a local contractor.

The Llandudno District Council adopted, on Wednesday, a report by Mr. A. H. Preece, relative to the lighting of the town by electricity, and decided to borrow £25,000 to carry out the scheme, in accordance with a provisional order obtained last year.

The Elizabethan mansion, No. 1, Quayside, Newcastle-on-Tyne, a five-storied structure, capped by four gables, which, up to a year or two ago, was used as a restaurant, is at present being pulled down, and will be replaced by a range of commercial offices. Mr. John Jackson, of Newcastle, is the builder.

News has just reached his family from Jamaica of the death of Mr. Hewley Arthur Stafford, a son of a former editor of the *Norfolk Chronicle*, and one who did yeoman service as a cricketer for his county. He was an architect of considerable repute in the island, and engineer of the irrigation company. He has left a widow and young child.

The public gardens and recreation ground, which have been laid out on the site of St. Paul's Churchyard, Birmingham, have been formally opened by the mayor in the presence of a large concourse of people. The work has involved an outlay of £2,600, and is the fourth scheme of the kind carried out by the Birmingham Corporation.

The town of Liskeard, whose original charter dates from the 13th century, is about, for the first time in its history, to bestow the freedom of the borough. This honour will be given to Mr. Courtney and to Mr. J. Passmore Edwards. The occasion on which the freedom of the borough will be given is the opening of a new hospital and the laying of the foundation-stone of a public library, both ceremonies to be performed by Mr. Passmore Edwards, at whose cost the works have been carried out.

A dedication service took place at St. Peter's Church, Barrowden, on Thursday in last week. The organ has been cleaned and repaired by Messrs. Nicholson and Sons, of Worcester, costing £20, and the instrument was removed from the eastern to the western bay of the chantry of St. Mary, north of the chancel. The building alterations have been carried out by Mr. Perkins, of Easton.

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### TENDERS.

\* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**ASHTON-UNDER-LYNE.**—For the alterations required to be done at Good Hope Mill, Ashton-under-Lyne, for Messrs. Ruttenau and Co. Mr. J. H. Burton, Warrington-street, Ashton-under-Lyne, architect:—

Bates, T., and Co., Droylsden	£754	0	0
Evans, C.	637	10	0
Wilde, J. B.	620	0	0
Ridyard, J.	615	0	0
Marshall, E. (accepted)	599	0	0

(Rest of Ashton.)

**BANGOR, Co. DOWN.**—For the construction of boundary walls and buildings at the new cemetery, for the Bangor Burial Board. Mr. T. W. Lamont, surveyor to the board:—  
Gordon (accepted) £1,415 0 0

**BERMONDSEY.**—For the erection of new premises in Bermondsey New-road and Old Kent-road, for Mr. E. R. Goodrich. Messrs. Wigg, Oliver, and Hudson, 7, Bedford-row, W.C., and 80, Leman-street, E., architects. Quantities by Messrs. Goodman and Simpson:—

Eaton, A., and Co.	£4,145	0	0
Outwaite, J., and Son	4,102	0	0
Sparks, J., and Son	4,095	0	0
Gladding, W.	3,993	0	0
Bentley, J.	3,887	0	0
Titmas, W., and Son	3,879	0	0
Battley, Son, and Holness	3,711	0	0
Atherton and Dolman	3,696	0	0
Bruty, T.	3,576	0	0
Gregar, W., and Son	3,664	0	0
Patrick, M., and Son (accepted)	3,597	0	0

**BOURNEMOUTH.**—For constructing approach roads, paths, and preparing ground for planting and grass, at the Bournemouth East Cemetery. Mr. F. W. Lacey, borough engineer and surveyor:—

Troke, G.	£1,395	0	0
Saunders, S.	1,176	0	0
Saunders, W. H., and Co. (accepted)	850	0	0

**BRADNINCH, DEVON.**—For the erection of a villa in Hele-road, Bradninch, for the Hele Paper Co.:—  
Nicks Bros., Beacon Works (accepted).

**BURY, LANC.**—For supplying 9in. turned and bored iron pipes for water, for the Bury Town Council:—  
Staveley Iron Co. (accepted).

**BURY, LANC.**—For laying a 9in. water main from Besses-on-the-Barn to new Prestwich Asylum, for the Bury Town Council:—  
Turner, T. (accepted).

**CARDIFF.**—For the erection of a pair of semi-detached villas at Radyr, near Cardiff, for Mr. E. Jenkins. Messrs. Griffiths and Jones, M.M.S.A., Tonymandy and Pontypridd, architects:—

Carey, H. G., Cardiff (accepted)	£1,327	0	0
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(Lowest tender received.)

**COLWYN BAY AND COLWYN.**—For promenade works and foreshore improvements. Mr. W. Jones, A.M. Inst. C.E., engineer and surveyor. Quantities were supplied by the engineer:—

Braithwaite, A., and Co., Leeds	£15,897	0	0
Williams, R. E., Colwyn Bay	15,065	9	3
Jones, W. P., Colwyn	14,243	0	0
Marr, L., and Son, Liverpool	14,085	14	3
Jones, J. B., Colwyn Bay	13,900	0	0
Johnson, H. G., Wrexham	13,875	5	9
Lawson, G., Glasgow	13,722	0	0
Law, G., Kidderminster	12,299	0	0
Weston, J., London	11,988	13	11
Biggs, J., Birmingham	11,789	6	0
Pilling, S. W., St. Helen's	11,495	9	11
Tempest, E., Marple, Cheshire	10,694	17	0
Moorsom, L. H., & Co., Manchester	10,358	0	0

(Engineer's estimate, £12,000.)

\* Accepted. † Disqualified.

**DOVER.**—For the erection of a hand and steam laundry at Buckland, near Dover, for Mrs. Morton. Mr. William H. Burt, 22, Doughty-street, W.C., architect:—

Denne, W. and T., Upper Walmer	£1,530	0	0
Parsons, J.	1,506	0	0
Bromley, W.	1,240	0	0
Austen and Lewis	1,209	0	0
Lewis, W. S. (accepted)	1,153	10	0

(Rest of Dover.)

**EDINBURGH.**—For digging a trench on the proposed site of the embankment at Talla, the site of the new water supply, for the Edinburgh and District Water Trustees. Mr. Wilson, engineer:—

Young, J., and Sons (accepted) on schedule of prices.

**GLOUCESTER.**—For the erection of pumping-station buildings, for the corporation:—  
Horton and Co., Taunton (accepted) £4,518 0 0



# THE BUILDING NEWS

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### GETTING ONE'S OWN WAY.

THE world, as critic, always assumes that the architect has had his own way. It judges of him by his work as it stands, and never thinks it possible that its shape, or style, or arrangement were forced on him against his will. But the world, as client, tells quite a different story. When it pays the piper it wants to call the tune. "It is my house, not yours; it is my town hall, not yours; it is my school, or college, or court-house, not yours; and it shall be built as I wish, and not as you wish." That, in one form or another, is what the world tells its architect when it requires his services; but when, having little choice about it, he has given them under these conditions, it conveniently forgets what the conditions were. Its memory becomes an absolute blank about them. "You say that I directed the plan to be arranged in this way, that I insisted on using these materials, and selected these fittings? Nonsense! I did nothing of the kind; and even if I had, it was your duty to stop me if you thought I was making a mistake. You were the architect, not I; and, of course, the responsibility rests with you." So this double-faced world of ours plays fast and loose with its advisers. It will not listen to them while there is time; but it throws the whole blame on them when it is too late. While they are young and hopeful they cannot believe the world will treat them so unjustly; but experience shows them it is this, and nothing else, they must expect. If, therefore, they are not to be every moment condemned for other people's faults, the one thing to which they must devote their whole heart and soul and strength is the getting of their own way.

The first condition which a client usually lays down is one as to cost. He will spend so much money, and no more. It is perfectly right and proper that he should make such a condition; but then, three times out of four he puts himself in the wrong by tacking on another condition which is quite incompatible with it. He will spend, he says, £10,000; but then he goes on and gives a list of the things he requires. If he is a well-intentioned, reasonable client, it may be possible to obtain them in a modest way for £12,000 or £13,000. If he is a covetous, grasping client, their value may very likely run up to £15,000, or even £20,000. This, however, is a matter which gives him no concern. He has told his architect what money there will be for disposal, and it is the architect's business to provide for that sum whatever accommodation he likes to insist on. He would not treat anybody else so. But building, he thinks, is not like other matters. It is a kind of lottery, and he hopes for a prize. He is going to put in £10,000 in money, and he means to draw out from £12,000 to £20,000 in value of goods, as chance may aid time. This is what the contract system has brought us to. It opens boundless visions before greedy minds. "My architect must get a low tender. He must advertise for estimates, and some unlucky builder is sure to make a slip, or purposely to do the work below cost price that he may get a little cash in hand, and stave off his bankruptcy for a few months. As long as he works cheaply enough, it is no business of mine to ask why." This, more or less vaguely, is what is in the client's mind. His architect is the man who is to get his work, or a large part of it, done for him at other people's expense, and to get it done well, too, in spite

of this. But the scheme seldom works smoothly. The client is trying to entrap a builder; but there are also builders of a dishonest type lying in wait to entrap the client. A low tender is accepted, and at first all goes well. But then arise endless disputes and delays. Every item in the contract is fought over. The contractor tries desperately to scamp the work. When his materials are rejected, he stops building, and complains that the architect is delaying him. Perhaps time is a vital matter to the client—and if so, he interferes at this point. Then the builder gains the day, and the architect is blamed for letting him build badly. If not, the architect is equally blamed for the months of time that have been lost in squabbles. Sooner or later, however, the premises are given up for occupation, and then comes the grand finale. The client finds claims to right of him—claims to left of him—claims for extras, ordered and not ordered—claims for loss of time, through the architect's refusal to pass materials and workmanship—claims, perhaps, for delay in paying or in granting certificates—claims, in short, under every pretext which ingenuity can suggest to a man for whom the success of his claims is a matter of life or death. Law expenses accumulate wholesale. Claim after claim comes into court, and is referred to arbitration. Witnesses are called in, testifying to facts and to fictions. Of the latter sort, there are the proverbial three grades: story-tellers, liars, and experts; but all have to be paid, and especially the experts. Whatever the award is, the client's pocket suffers, and for all his sufferings he only blames his architect. Yet all that has happened is the direct result of the client's first instructions. He insisted on trying to get from £12,000 to £20,000 worth of goods for £10,000 in money, and events have dealt out to him pretty nearly what he deserves. But, of course, he does not see this, or want to see it; he thinks his architect might have helped him in the scheme, and held him harmless from the results. The architect knows better. It is clear to him, after this experience, if it was not before it, that, if his life is to be worth having, he must at all hazards get his own way hereafter—at least, in vital matters like this—and he considers how, on the next occasion, he is going to manage it.

Next time, perhaps, the points in which he is overruled are small ones—small in themselves, that is, though not small in their effect on his reputation. He is building a house, or altering one, and then, as is natural, his client's wife is very much in evidence. Perhaps the rooms have to be planned to fit existing furniture. The dining-room fireplace, for example, must be at this point and the dining-room doors at that point, to leave the exact wall-space that is wanted at some other point. In consequence, there is a constant draught from the door to the fire, as the architect predicted there would be, and this is a standing grievance against him. The doorways, too, are only to be 6ft. high, like those in that quaint old farmhouse where the client lodged last summer, and the result is that he smashes his hat every week or two at least for the first six months, and that his visitors do the same to the end of the chapter. Another grievance against the architect. Then his wife wants the paint of a delicate green, and flatted, because one of her friends advised this, and when she gets it thinks that the architect has allowed some strange thing to befall her, because their servants' fingers mark it, and the soap brings it off. As to the kitchen range, she can never forgive him. That he might make no mistake, she took all the trouble of selecting it by herself, and went into a nasty, dirty place called Thames-street, where you cannot move about for waggons and men carrying heavy things, who are always crying "By your leave!" and then running against you;

and after that she went up by a lift into a kind of loft, all cobwebs, that had not been swept for years and years, and then bought a kitchener that they assured her would do everything she could possibly wish; and now it turns out to be of no use at all. It was to be so economical, and yet it burns such quantities of coal, and the cook will have all the dampers out as far as they will go; and if you lift up the bottom of the grate, the oven does not get properly hot, and in any case you cannot have a bath for half an hour after the fire is lighted in the morning; and when you have had two or three baths, the water is almost cold again till it gets warm, and how the architect could let her be taken in so, she cannot think; but she will take care that none of her friends shall ever suffer in this way—at least through him. The architect probably forms the same resolution, and resolves that, either by force or by subtlety, he will get his own way in these matters with the next lady client. He finds he may count with certainty on a fair share of more or less polite abuse, and begins to see that he had better have it for keeping people out of mischief than for letting them go into it.

Competition committees take great pains to prevent architects from getting their own way. Not only do they, with the rarest exceptions, try to obtain their £12,000 or £15,000 work for £10,000, but they often issue a lot of vexatious instructions for which there is no apparent motive. They will decide, perhaps, that their building is to be faced with white bricks, or to be roofed with green slates of large size; that the windows are to be glazed with plate glass, and that all the internal woodwork is to be stained and varnished. Sometimes their architectural powers become quite irrepressible, and then they practically settle the whole plan and arrangement of the building themselves. They send out a list of rules, and prescribe not only the size, but the position of every apartment. They state how long, how wide, and how high it is to be, and in what direction it is to face. They put rooms on the ground floor which would be better above, and rooms, perhaps, in the basement which for every reason and healthiness and convenience ought to have been on the ground floor. Now, if the object of a competition were to get the best design for a given building, it would, of course, be a standing principle amongst assessors that such nonsensical conditions as these should be simply ignored. It would, on this theory, be the assessor's first duty to set them aside, as rules which never ought to have been made, and which were too silly to influence his award for a moment. He would then select the scheme which, within the actual and not the artificial limitations of the case, would, in his judgment, make the most successful work. But if an assessor acted in this way, all the space in all the architectural journals of the kingdom would hardly hold the letters which would be written to condemn him. For the popular belief at present is, that a competition is not instituted for the sake of the building at all, but entirely for the sake of the competitors. What the committee are trying at, people think, is to ascertain which of the architects who send in plans can best solve any problem that may be set before them, and it is a mere accident that this problem involves the destinies of an important architectural work. The assessor's great business, according to the popular fancy of the day, is not to see which solution of the problem would make the best building, but which competitor has solved it with most exact regard to all the minutiae of the plans and regulations—a totally different thing, and a very unpromising one as regards the permanent structure which is to result. This, however, is how matters stand. Very often, therefore, the follies of the first "Instructions" are perpetuated in bricks and mortar,



and then there is another of the periodical outcries about the certainty of bad results from competitions. But now and then the winner is a real architect, and is wise enough to see the importance of getting his own way. Till he gained the competition he had, as the Americans say, to lie low. It was useless, at that time, for him to protest against the absurdities imposed on him. He had no choice but to accept them—on paper; but he never meant them to get any further. At last the time arrives when he and the committee meet face to face. He quietly discusses the objectionable features with them; shows how they will fail, and how to improve on them. With tact and good temper he succeeds. If there is a strong feeling against any one of his alterations to-day, he allows the talk about it to die out, and lets it turn up by another side at some subsequent time. The end is, that he gets his own way; that the building is saved; and that the committee, very likely, scarcely observe that everything has not been done according to their original directions.

Getting one's own way in architecture has doubtless to be managed much as it is in other matters. There is needed the same caution against insisting too much, the same care to avoid forcing opponents into extreme statements, which they will afterwards be ashamed to stand on; the same skill in leading them to put forth, as brilliant inspirations of their own, the very proposals which they would have been the first to rise up against if they had been made to them by another. But experience suggests a few other maxims specially suited to the architect. Be rather on the side of reducing the cost than of adding to it. The shallowest client, the stupidest committeeman knows that you are paid by a commission. The stupider and shallower he is, the more surely he will always believe that your first object, at all junctures, is to run that commission up, and he will suspect and oppose all changes which tend in the least degree to have that effect. When the committee want to make additions and improvements, fairly point out the cost of them, and if they are carried, let them be so after a very plain statement on your part of how large an extra they are likely to lead to. Have the extras so estimated added up, and kept in order. You may think that a dozen men of business, some of them with incomes of thousands of pounds, will always know whereabouts they are as to their expenditure on the extras in their building. It is not so. They will order £350 worth of extra work in March, £600 worth in April, and £400 worth in May, and will then be almost horrified when you tell them in June that they have already exceeded the contract by £1,350. Lastly, when you differ from them, always, if possible, give what they will consider a "practical" reason for your opinion. Put it, if possible, on the ground of construction, or of convenience, or of cost, or of light, or comfort, or acoustics. Such things as these are what the Philistines seek. The strong reason for what you want to do may all the while be an artistic one. But if you name this, all the people who take boorishness for manliness will fight against your proposal as unmanly; and all who take ugliness for holiness will oppose it as more than half-sinful. Nobody will vote for it, except the thoughtful and the open-minded, and a very little knowledge of life will show how far their support is likely to take you. On the whole, you and every true architect are oftenest in the position of the nursemaid who is subject to the orders of the child, and who, as a high authority tells us, will find very dexterous practice necessary if she is to keep matters straight. To get your own way under this singular arrangement is a vital necessity, and there is only one other equally vital—namely, that this way, when you do get it, shall be the right one.

## TWO ASPECTS.

PEOPLE with only one idea are numerous enough. They think that it is inexcusable for anyone to advance any view that is contrary to their own, and all such who are bold enough to question their authority are pronounced heretics. Have we not had those who have put in exclusive claims for architecture?—men, for instance, who have opposed colour for decoration; who protested vehemently against the colour decoration of the interior of St. Paul's Cathedral against mosaics and marble veneers; who opposed shams to the extent of decrying the use of paint or plaster under any circumstances. Have we not had theorists of harmonic proportions and ratios? In all these and many more instances experience has proved these ideas to be "narrow," if not quite wrong, and such notions have been set aside as the views of faddists or extremists. And the champions of one-sided doctrines are disregarded. As the old legend says, there are two sides to every shield; so we may take it that there are two sides or aspects to every branch of human thought or speculation. A great law resides in the story; it is that known as polarity, or action and reaction. In everything, no matter what it is—art, theology, politics—there is the principle of dualism. We are told, indeed, by an incisive writer that "an inevitable dualism bisects nature—each thing is a half, and suggests another to make it whole." To go no further than art, we have abundant instances of this law in the way painters, and architects, and designers of ornament have acted. Was not what we call "pre-Raphaelitism" a protest against the Renaissance spirit and academism, and traditional rules of painters, which destroyed all the life and simplicity of nature, and reduced the art to a set of formal rules? Again, is not what is called "impressionism" a reaction against a too exacting regard for the ordinary pictorial tradition and its literalness of transcription? And what are the newer schools and tendencies of art but so many modes of seeing things in another light than that in which we have been accustomed to view them? So it is in architecture. The fluctuations and almost pendulum-like reactions in which the more classical and regular styles have been followed by the less regular and romantic school, the formal by the picturesque, are remarkably suggestive. Or still, again, if we look at the development of ornament, we shall find at one time a predilection for geometrical bases or motives, at another a decided admiration for natural forms, conventional ornament succeeded by realistic, and so on.

Do not all these double phases of art show that no one aspect is true without a corresponding one, and that wherever there has been an excess of one kind, there is sure to be a defect in that which follows? But we confine our attention to the dualism which runs through architecture and its practice. When the Greek and Italian styles were at their height, the disciples of those schools of Classic could never realise that there was a reverse side to the shield, and that the more they insisted on adherence to rules and models, the sooner would the necessary reaction follow. And have we not got it now? Never was there a time, probably, when precedent and purism of all kinds are at a greater discount than they are now. Some of us can remember the fracas there was between Greek and Goth; we have lived long enough to see the inevitable reaction. Then there were those who could not see anything good in any but the purest or earlier phase of Gothic—the thirteenth-century English, who repudiated with equal rancour the later styles; others who declaimed against French or Italian and German Gothic. It was not perceived that the earlier type was but tentative and transitory—that it only took account of certain conditions—and that in

both the Decorated and Perpendicular periods something important had been gained in reducing weight and mass and increasing light, and in improvements in vaulting. So again, French and Italian Gothic lent their influence to brick building: each change has, indeed, brought with it some quality that was at first unperceived. And now we have turned again from foreign to our own English architecture of the 16th and 17th centuries, and have found, after fruitless researches into past and foreign styles, that there is something in our own domestic architecture that cannot be supplied by foreign examples. In short, the whole progress we have made during the last half-century has been a succession of reactions, going a little too far in one direction, and next a little too far in the contrary direction. Each reaction has left us better off in the main: our architecture is wider and broader for comprehending both aspects of art, and for including men of such diversity of faith and practice as we find now—if, indeed, this breadth of view is a thing to be thankful for.

But there is the law of dualism also at work in other directions, and we are just now brought into contact with a great many dual movements which show the same opposing currents. People with only one idea are numerous enough to make it look wrong to discountenance our modern systems of doing work—for instance, to say anything against contractorship. A few bold spirits have lately been found to tilt against the modern contractor—an "institution" to whom we owe so much, and who has brought peace and an unruffled temper at least to many who like to be relieved from the onerous and responsible duties of the builder; even corporations and county councils have found out by experience that the intervention of the contractor is not the most desirable in all cases. As in other instances, it is a reaction. The idea that one man should represent all the workmen, and make himself responsible for them, is repugnant to the other view of permitting every craft to do its own work. For a long time the profession and the public were unanimous about the advantages of this course, and considered it superior to the French or Scottish system of employing separate tradesmen; but lately the older plan has reasserted itself, and the principle of the direct employment of labour is now recognised by the L.C.C. and by other municipal bodies. No doubt good is arising from the reaction, and more attention to special trades has been the result. Again, the cleavage which has taken place between general contracting and the separate trade or co-operation movement is to be found in the antagonism which has arisen between "professionalism" and art crafts, supported as it is by many of our leading architects and artists. It is idle to shut one's eyes to the breach which has been made between the two, or to attribute the antagonism to the mere vapourings and sentiment of men who have won a reputation, and now seek to repudiate their professional régime. Is there not something deeper in this recoil? May not the *rationale* be found in the conviction that the best art is unteachable, and that we cannot create genius—that the greatest of our architects have been born? The reaction, too, has been from artifice and routine—from dry academism, which the last century so persistently fostered, added to the efforts which have lately been made to convert the art into a commercial or business calling. A natural revolt has taken place between the men who are born artists, and who make architecture a study of their lives, and those who adopt it as a means of making a living. The latter have dragged it down to a commercial level, have made it a matter of percentages, and are sticklers for all kinds of professional privileges. Messrs. Card, Brass-Plate, and Co., architects and surveyors, stand on their pro-



professional rights, take in every class of business, from preparing plans to valuations for mortgages, and naturally disgust the Rossettis and Burne-Joneses of architecture, who are endeavouring to impart a poetic feeling into the veriest commonplace of building. We have hence in our midst two hostile factions—one representing the surveying, and the other the high-art opinions—and we should be sorry to see either disappear. Both are necessary elements in a progressive art, and each may benefit by a permeation of the spirit of the other. The architecture of the office and that of the studio or the workshop have entered into a conflict, the result of which is not yet assured, and it seems as impossible to say they will be reconciled as to suppose there is any way of mixing oil and water. Educational schemes may bring about a kindlier feeling between the two factions, but that they will ever produce that union or co-operation which is desired seems improbable, so long as there are two ways of looking at things. To some extent at least the educational movement in architecture has been helpful to the ordinary pupil and plodder, and has “manufactured” a large number of “architects” in the same manner as our national art schools have turned out “artists” and amateurs who understand the principles and technical qualities of art, but who can neither invent nor see nature in any other way than they have been taught. Our buildings reflect the same opposite tendencies. There is the commonplace commercial building in which the engineer and the builder have done their best to minimise material and labour, with its hard, unsympathetic lines, or that pleasing and popular admixture of the builder and decorative artist, qualities which we see in cheap “artistic” furniture; and, on the other hand, there is the building which the architect has invested with a nature or a sentiment far above the taste of the public, both of them exemplifications—one of them of the practical, and the other of the artistic mind. And it would be contrary to experience to expect any development of architecture that will unite these tendencies, or any educational influence that will obviate the antagonism. No man has been able to effect a more than partial or temporary deviation of any great movement or current of public taste—the parted water unites behind our hand.”

#### THE CONDITIONS OF BUILDING CONTRACTS.

AT the ordinary general meeting of the Surveyors' Institution, held on Monday last, the discussion was resumed of Mr. A. A. Hudson's paper on the above subject, read at a previous meeting.

Mr. H. Northcroft said, with reference to the position of a quantity surveyor under a building contract, he thought that this should be a recognised one, and the quantity surveyor's status properly defined, as it was not at present. It was suggested that the surveyor and his quantities should be made a part of the contract; but Mr. Hudson went even farther, and desired that the quantity surveyor should be made the measuring arbitrator, and should sign interim certificates based on his measurements of work done. He thought that was going a little too far. In a public contract the quantity surveyor's position could be easily defined, but it was very different in the case of private contracts. A private employer often did not even know that such a person existed, and it was very difficult to convince him of his usefulness. It was, of course, not right to conceal the employer's liabilities from him or to misrepresent their nature; but it was often very difficult to have to persuade him that he must pay for what he looked on as a superfluous addition to the cost of his work. He was afraid the quantity surveyor could scarcely be made an element in a contract between a private employer and a builder. As he understood Mr. Hudson, he desired that there should be arbitration of three kinds: by the architect alone as regards materials, by the surveyor as to quantity of work done from time to time, and the consequent interim certificates, and by an outsider as

to differences of opinion as to the carrying-out of the intention of the contract. This seemed very fair. An outside man should decide what were extras and what were delays. He could not see why an architect should ever be charged with unreasonableness. A building contract was a binding one, and could not be set aside on the ground of incompatibility of temper any more than could a marriage contract.

Professor H. Robinson, speaking as an engineer, contended that when an employer had selected a professional man to carry out his work, and had agreed, on his advice, to place it in the hands of a certain contractor, he should leave the matter entirely in the engineer's or architect's control, and should not himself direct the contractor or approach him in any way, nor have any voice in any contract made between the builder and any sub-contractor or manufacturer whom he might have selected. It was the business of the architect to make himself acquainted with the employer's requirements, and so frame the contract as to secure their fulfilment. Whether this was from time to time being done he was in the best position to judge.

Mr. C. J. Mann said that a question which had occurred to him, seemed to have been well answered by Mr. Rickman at the last meeting. He wanted to know what was the best thing which would make the quantities part of the contract, and Mr. Rickman had said that, “whatever came from the architect's office, whether drawings, specifications, or quantities, after the contract was signed, must be treated as coming from the employer through his agent, and that, he thought, made any quantities furnished through the architect part of the contract, as they should be.” He should also have thought that the deposit of a priced copy of the quantities deposited to form a schedule for variations, rendered these quantities part of the contract. He was sorry to find that there could be more than one opinion as to the meaning of the term “best.” The surveyor could scarcely be described as the architect's assistant, as had been done; but it was important that the architect should have the supreme control. The law as to provisions and sub-contracts was not, he thought, very clear, and he should like to have more light thrown upon it.

Mr. H. T. Steward said he believed in both parties to a contract being free to make it as they pleased. Building contracts and engineering contracts differed very much with respect to the arbitration clause usually inserted. In the latter, the engineer was usually arbitrator on all points. An architect, as a rule, confined the competition for the execution of his work to a limited number, and took care not to ask anyone to tender in whom he could not trust; while in large public works the corporation was often bound to publicly advertise for tenders, and the engineer had consequently no selection. Building contracts had for many years generally contained what were known as the “Builders' and Architects' Conditions,” which he had personally found to work fairly and reasonably. They were not, of course, perfect; but in the interests of all concerned, he should be sorry to see them departed from to any great extent. No conditions could entirely prevent litigation and arbitration so long as human nature was what it was, and so long as individuals could not all be brought to look on matters in the same light.

Mr. Alexander Payne was surprised to hear any architect suggest that in ordinary contracts the power of the purse should be given to the quantity surveyor, for he thought the arrangement would prove an impracticable one. In many cases, and especially in the provinces, the custom still prevailed of the architect taking out his own quantities, and it was satisfactory so far as it put everything in his hands; but in large works it was impossible, and the quantity surveyor came in, as had been said, as the architect's assistant. When he had got out the quantities and contract, his interest in, and knowledge of, the work ceased. He thought extras arose, not from the architect's fault, but because the employer, and members of his family, changed their minds as to their requirements. It was quite impossible to supply the whole of the detail drawings with the contract, and it was unreasonable to expect them. Prime cost value was defined by the new “conditions” of the R.I.B.A., as fair value less trade commission, and builders contracting under these new conditions should be careful to note this.

Mr. A. B. Hudson considered that the architect

should be sole arbitrator, if possible, and that in many cases it was possible. He thought that quantities should form part of the contract, and in all cases should be delivered open as a guide to the architect in estimating for certificates.

Mr. W. Woodward said, with regard to the word “best,” he took it to mean that better could not be got, and if the architect could and did produce better, the question was settled. The word “reasonable” depended so much on what each side thought reasonable, that it was of little value. The architect should have complete power over materials and workmanship. He did not agree that what was “best” in small work differed from “best” in larger contracts. His experience was that independent London builders refused to sign the new R.I.B.A. “conditions.” He could not agree that they had proved generally acceptable, and he hoped to see them withdrawn, and a slightly modified form of the old conditions substituted.

Mr. W. H. C. Payne (Chairman of Building Act Committee of L.C.C.) said the body he represented had their own building contract, which, if not perfect in form, represented honest efforts to get as near fairness to all parties as was possible. Clauses in contracts should be to a certain extent elastic, and not too binding or grievous on either side. Many builders did not read the conditions at all, but trusted either to their luck or to their knowledge of the architect's fairness.

Mr. A. King agreed that “best” could have only one meaning. He has found builders very ready to sign a reasonable contract, even without any arbitration clause, which was a very awkward one if, on objection being raised, the builder immediately availed himself of it.

Mr. W. Matthews did not think that the quantities should be made a part of the contract, nor that the quantity surveyor should be made a party to it. There were already too many persons concerned in a building contract, and any addition to their number could only make confusion worse confounded.

Mr. Hudson, in replying to the whole discussion, disclaimed any intention of imputing bias to an architect acting as arbitrator. He only suggested that there was a certain delicacy about the position of an arbitrator who was paid by one party. The word “best” was mere surplusage. If the materials and work were to the satisfaction of a certain-named person, it did not matter whether they were described as “best” or “blue” or “yellow.” He would let people enter into whatever contract they pleased, and would let the builder be responsible to and for every sub-contractor. The employer might nominate sub-contractors, but must not interfere with them. Prime-cost items should be provided for by a round sum, to be deducted if they were not required. The mere fact of quantities having been supplied for the purpose of the tender on which the contract was based did not make them part of the contract, as had been suggested. No documents or communications preparatory to a contract in any way affected it after it was once completed. It then stood by itself, and superseded all previous arrangements.

#### FACTORY CONSTRUCTION AND FACTORY ACTS.—I.

By GEORGE H. BIBBY, F.R.I.B.A.

##### INTRODUCTION.

UNDER the provisions of the Factory and Workshop Act, 1891, section 7, and the Factory and Workshop Act, 1895 (various sections), the sanitary authorities throughout the provinces, and the London County Council in the Metropolis, have authority to demand of the owners of factories and workshops, wherein more than forty persons may be employed, that such means of exit shall be provided as may be reasonably required under the circumstances of the case, and in default of action on the part of such public authorities, a Government Inspector of Factories may (Factory and Workshop Act, 1895, sec. 10, sub.-sec. 5) take proceedings against the owner of any such factory not constructed with the proper means of escape for the persons employed on the upper floors.

To architects and builders these Acts of 1891 and 1895 have already proved of some importance, for, as a result, many factories and workshops have been more or less reconstructed in accordance with the necessities of the case, and with official requirements, and with the view especially



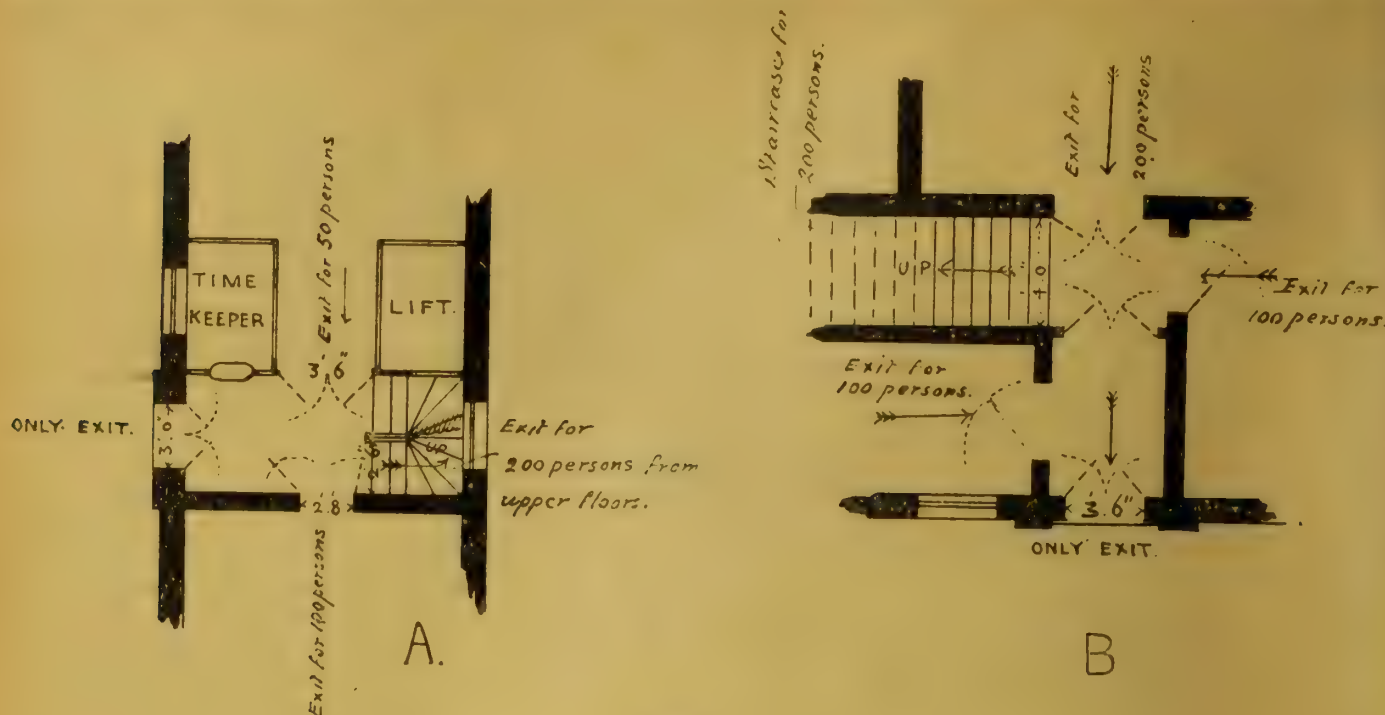


FIG. 1.

of securing the safety of the workpeople in the event of fire or panic, and in but very few instances have the inspected factories been found to be absolutely perfect as regards their means of exit.

The amount of work, however, remaining to be done in the reconstruction and rearrangement of factories and workshops to bring the buildings into conformity with the Acts of 1891 and 1895 is of enormous extent, and, if performed even to a moderate extent, must certainly provide an important occupation for a considerable period, not only for the builder and architect, but also for the solicitor. There can be no doubt that there is far more work to be done in providing factories and workshops with sufficient means of escape for the workpeople than was at any time ever necessary for places of amusement, greatly as these have required and received improvement in this respect during recent years, and as the result of the action of various authorities.

Large factories in considerable numbers exist in the provinces and in London where floors above floors are crowded with men and women, who work in buildings, the internal construction of which is entirely of wood, frequently saturated with oil from the machines or manufactures, and with the further danger resulting from the storage of varnish, oil, spirits, and petroleum about the premises, the only means of exit being frequently merely a wooden step-ladder (2ft. 6in. or less in width), this being, too often, the only means by which hundreds of persons are enabled to descend from the upper floors of the factories and workshops wherein they are engaged, and not unfrequently, to make matters worse, the factory windows are all formed with iron frames divided into small panes, and with openings intended for ventilation, but too small for a human being to pass through, thus preventing the workers, in the event of fire, from obtaining access to movable fire-escapes, should their (frequently) only staircase be destroyed by fire or be rendered unuseable on account of fire or smoke. In this way persons have been burnt to death standing at the iron frames of the factory windows, and in full view of a crowded street, none being able to give assistance.

Probably within no class of buildings has there been a greater loss of life than in factories and workshops; large numbers of the employed are frequently congregated in these buildings, and, as regards area, so closely packed that there is not more than the absolute elbow-room allowed than is requisite for the due performance of their work (as in many cigar and cigarette workrooms), and the cubical contents of the various apartments in some factories appear to be only brought into accordance with official requirements, per head, by an increase of the height of the apartment, or by the inclusion of spaces used for the

storage of goods in the rooms within which workpeople are engaged, and which spaces are, of course, of no sanitary utility to the workers.

In stating that the death and accident rate in factories is much greater than in any other kind of building I have in view, not only the loss of life and limb that has so frequently occurred by reason of the unsatisfactory arrangement and construction of certain factories and their exits, but also those very common accidents—the results of fire, explosions, noxious gases, unprotected machinery, bursting of boilers, and other contingent causes, the continual recurrence of which should afford additional arguments, if such were needed, in favour of the provision of further means of escape from factories and workshops.

Under such conditions as above named, and with exit arrangements such as are indicated at A on Fig. 1, and which are only too common both in the provinces and London, the position of workpeople employed on the upper floors of such a factory must always be of considerable danger, the 300 persons employed upon the premises having a door only 3ft. in width, and with the disadvantage of opening inwards, and in many factories these outer doors have been kept locked during the hours of labour, to prevent the workpeople from leaving without permission, or to prevent loss by thefts, and for other kindred reasons, and thus a further danger in the event of fire or panic is created. The staircase in factories containing 300 to 400 persons is sometimes not more than 2ft. 6in. in width, and, as shown at A on Fig. 1, and too often constructed entirely of wood with many winder steps, and the placing of a lift against the stairs (which is a most common practice) is calculated yet further to endanger the staircase in the event of fire, and to render it impossible to pass in the event of smoke or fire reaching the stairs. An additional source of danger is such an arrangement as is shown at A, where three streams of workpeople would, in leaving the premises, meet in one confined space, and where the doors, when opened, would be likely to impede the exits from each direction. The removal of such staircases, and the entire rearrangement of such exits as those shown at A, in Fig. 1, is frequently a matter of considerable difficulty to the owners and occupiers of such factories, particularly if the buildings only cover a limited area of land, and are of great height with many floors, and no further land can be acquired. Under such circumstances the erection of a sufficiently spacious stairs of fire-resisting materials, and within an inclosure of brickwork, occupies so large a proportion of the area of each floor with which it communicates as to cause a serious but unavoidable loss of workroom space, and supplies a strong argument against the policy of erecting lofty factories on very limited areas of land.

The danger of various streams of workpeople meeting at one point of exit is again shown at B in Fig. 1, where the doors are arranged to open in such a manner that the staircase would probably be narrowed at the foot by the door of a workroom being forced outwards by its occupants, in their effort to reach the only exit.

The prospect of a fire spreading from floor to floor of a factory, even if such floors are of fire-resisting materials, is somewhat greater than in many other buildings of similar construction, inasmuch as openings are often unavoidable for shafting, belting, piping, and various mechanical appliances and processes, and in many manufactures the materials stored and used are of a highly inflammable nature: hence the necessity for providing structural arrangements in factories, carefully devised for the purpose of securing the safety of the workpeople, and more especially of those who, being employed upon the higher-floor levels, suffer from the risks of dangerous manufactures or operations carried on upon the floor beneath them.

Under the provisions of the Factory and Workshop Act, 1895, the doors of all rooms in factories and workshops constructed or commenced after 1895, wherein more than ten persons are employed, must be constructed to open outwards. This regulation is not only of great direct importance, but indirectly influences the carrying out of other desirable requirements. For instance, if such doors are made to open outwards towards a staircase, the landings of such staircases would have to be made wider, so that the doors when opened should not curtail in any way the breadth of the thoroughfare of the staircase at any point, or otherwise such doors would have to be set back into the workrooms, the latter usually being the less convenient method. A further desirable regulation provides that no doors of the rooms of a factory shall be locked during the hours of labour, or when used for meals; therefore, unless such rooms must be locked up at night or during holidays, no locks for these or bolts need be provided for by the architect.

Of the various forms of defective staircases and step-ladders provided, even in recently-erected factories, none are more common than the apology for a stair formed by a construction of treads without risers, but with a boarded soffit. In the event of a fire the treads and soffits are quickly consumed, and convey the fire with great rapidity from floor to floor, and yet many of the finest factories have nothing better, and when accompanied by floor-joists unprotected by fire-resisting plaster, the entire destruction of the building is frequently effected in a remarkably short space of time. These step-ladders have been largely used on account of their cheapness and near resemblance in general appearance to ordinary stairs; but there can be no question as



to their utter unsuitability for factory purposes, unless under very exceptional circumstances.

In some factories fire-buckets, hydrants, hose and hose-boxes are arranged upon the various landings of a staircase, thus in some cases very greatly reducing the width of the staircase thoroughfare. Wherever these occur, the landings should be made correspondingly larger, and in no case should the custom be continued (so very usual in many old-established factories) of fixing shelves and cases at the sides of the stairs and landings for storage purposes; neither does it appear to be right that a staircase upon which men and women may have to depend for their lives should be used for the transit of heavy or bulky packing-cases, which, if found upon a staircase during a panic or fire, must inevitably occasion a serious risk of disaster.

There can be no question that factory owners and occupiers have in some instances not fully grasped a correct idea of the danger of the existing state of affairs with regard to provision of sufficient means of escape of their workpeople from the upper floors in the event of fire or panic, and that it is only needful in their cases to receive the opinion of experts upon the subject to insure that suitable precautions and improvements would, when necessary, be carried into effect.

Public attention, however, has been specially directed to the condition of factories and workshops in these respects, and the recent Factory and Workshop Act of 1895 not only strengthens the previous Act of 1891, but also extends the field of its operations very considerably.

(To be continued.)

## COUNTY LUNATIC ASYLUMS.—XLIII.

By GEORGE H. BIBBY, F.R.I.B.A.

### ASYLUM COMPETITION PLANS.

PERHAPS few circumstances in connection with asylum competitions are more surprising to each competitor (excepting, perhaps, the decision excluding his name from amongst those of the authors of selected designs) than the excessive variations in the amounts offered as premiums—or “prizes,” as these are described, and evidently considered, by some of the promoters of new asylum works—some building committees offering sums of £300, while others only promise £30, for sets of plans which would in each case involve an equal expenditure of skill, time, and money upon the part of the competing architect.

The first item is usually the deposit of a sum of from one to five guineas to the promoters of the proposed asylum, upon the receipt of the conditions of the competition and the plan of the site, but returnable, as a rule, only upon the receipt by the promoters of a set of *bond-fide* plans. Surely this is not quite fair to the architects proposing to compete, inasmuch as the latter may, upon examination of the conditions supplied, be justly of opinion that the requirements of the committee and the regulations imposed are impracticable or unfair. In some recent competitions the committee have, upon their attention being directed to the matter, met this difficulty by agreeing to refund the deposit, should any would-be competitor return the copy of the conditions and the plan of the site within a week or so of their receipt, and with an intimation that the same were unacceptable.

A further trouble and expense is that entailed by a visit to the site of the proposed asylum, which sometimes necessitates a journey of two or three hundred miles or more; but after many such expeditions I have never found them unnecessary, for many asylums being very large buildings, and upon considerable estates, full inquiries can only be effectively made by a personal inspection of the surrounding district, and with the view of obtaining that correct impression of the surroundings and district that can only be secured by the eye.

For the preparation of a set of competitive designs for an asylum of average size a period of from three to four months is frequently allowed, and is not more than necessary, especially as such work frequently quite disorganises an architect's ordinary practice and routine, and usually occupies a large proportion of the energy of his whole staff for a considerable time, and at much expense, to which must be added the cost of mounting the plans frequently upon exceptionally large strainers, and of printing reports, &c., and the wear-and-tear inevitably incurred by the necessity of night-work during the later stages. Upon the whole,

therefore, the three premiums, as usually offered, afford a partial return for the trouble and expense incurred; yet (unless the competing architect obtains the commission) the premiums in substitution can seldom be regarded as financial “prizes.”

Schemes for the building of new asylums or the enlargement of existing ones are in active progress throughout the country, but certainly not to anything like the extent that is requisite, and as overcrowding has recently been reported in thirty or forty county and borough asylums, it is surprising that the necessity for open asylum competitions has not more frequently occurred. During the past few years these have shown a tendency to increase, as for the asylums at Newcastle-on-Tyne, Cheddleton, Denbigh, Warrington, Dublin, and elsewhere, all of which were thrown open to competition.

No less than twenty county asylums in England and Wales, and many others in Ireland and Scotland, have recently been adversely reported upon as regards the insanitary condition of the buildings, arising in some instances, no doubt, as a result of overcrowding. This will not be a matter of surprise if it be remembered that on the 1st of January, 1895, there were 2,000 more insane persons in England and Wales than during the previous year, and warnings have been issued to the authorities by the Commissioners in Lunacy that the demand for pauper lunatic accommodation is urgent, and that they “fear that troubles are ahead in that direction.”

Further than this, the following county and borough asylums were, at the date of their last report (June 20, 1895), still without proper detached isolation hospitals for fever and infectious cases requiring to be removed from the main buildings—namely, Cambridgeshire, Ely and Cambridge, Derbyshire, Somerset and Bath, Carmarthen, Cornwall, Durham, Leicestershire, Lincolnshire, Newcastle-upon-Tyne, Notts, Norwich, Salop, Suffolk, Worcestershire, Bristol, Birmingham (Winson Green), Birmingham (Rubery), Exeter, Hull, and Plymouth.

Buildings are also required to a much greater extent in connection with workhouses for the reception or retention of harmless insane persons who could therein have all the attention and care they require, and at a reduced cost, instead of crowding out from asylums, as at present, cases in which asylum treatment is almost essential to recovery.

An asylum competition, open to all architects, is undoubtedly the most satisfactory method for obtaining preliminary plans and improved ideas for the erection of additional institutions; but from various causes only a very limited number of architects usually take part in them, and of those who do respond, a fair proportion depend, as regards the plans, upon architectural and medical assistance outside their own offices; a common arrangement, at all events with regard to limited competitions, being to pay a stipulated sum to a specialist, who would, in the event of success, take a further remuneration, either in the form of a commission or as a recipient of the whole or a portion of the premiums, but usually with the distinct understanding that the specialist's name must not be disclosed.

The competition plans for an asylum are frequently prepared to a scale of 16ft. or 20ft. to an inch, and these are probably the most convenient scales that could be adopted for the purpose, for when, as is not unfrequently the case, the buildings are spread over an area 1,500ft. in length, by 400ft. in width, the strainers upon which the plans have to be mounted must be of large size—say 10ft. by 4ft. 6in., but sometimes very much larger. In such cases it is a good plan to draw out all the various plans of all the blocks, and to cut them in outline with a sharp knife. The long lines of corridors would then be set out on the surface of a plain sheet of paper, after it is mounted upon the strainer. The positions of the various blocks being then measured out, the numerous cut-out pieces of paper upon which each block is drawn could be pasted down afterwards with great ease, and thus the inconvenience of working upon enormous sheets of paper be avoided. If this be done neatly, and the colouring left until the last, a good result can be obtained, and with the further convenience of being able to divide the work of preparing the drawings of the various blocks of buildings amongst several assistants—an impossibility, or a great difficulty, if one sheet of paper only be used. If done properly, the general appearance of a plan so prepared is very effective, and the

joints are scarcely visible, even at a close inspection.

Two or more sections, to a corresponding scale with the general plans, are always necessary, and are usually supplemented (in competitive work, as in the case of all sets of drawings to be submitted for the approval of the Commissioners in Lunacy) by drawings to a much larger scale, showing sections of important portions of the building, and with the proposed system of construction and ventilation, &c., clearly defined. Failure in these latter particulars has frequently deprived the authors of good and well-arranged plans of the successful position in the competition that they might otherwise have obtained.

The report, description of the plans, and estimates presented with the competition are too often left untouched by the architect-competitor until within the last few days of the period allowed for sending in the drawings, the result being in many cases that an excellent scheme is presented with an incomplete, and badly-stated description of the drawings, with hurried and and incorrect estimates of the probable cost, and with statements in reference thereto which the competitor would gladly have withdrawn after more matured consideration. The report is an important item, and it is not surprising that competitors should be anxious to scrutinise each other's views upon a scheme that all have worked upon with different results, however remarkable may be the circumstance that architects do accumulate many copies of the printed reports issued and intended only for the use of building committees, and not only of the reports, but of those privately circulated lithographic copies of the plans and elevations which tend to familiarise committeemen with the main requirements, and, therefore, influence the decision in those cases where an architect-assessor has not full power to decide the matter.

With regard to the report submitted by the competitor, the conditions of the open competition under motto should distinctly disqualify any architect from making any reference, direct or indirect, to previously executed asylum works, or even from stating the fact that he has carried out such works. It is simply required for the purpose of giving the author's views in reference to the adaptation of the buildings to the site; the arrangement of the various floors, the style and construction of the proposed buildings, the precautions he proposes to adopt against fire; the provisions he suggests for water-supply, heating, ventilation and light, drainage; with some particulars in reference to the kitchen, laundry, engine-room, &c.; the manner in which he proposes to classify and sub-classify the patients; a statement as to the cubical contents and areas allowed per patient, together with an estimate of the cost, showing separately the approximate costs of the various buildings, and the manner in which he has arrived at the same.

As the number of items to be dealt with in such asylum reports is considerable, it is very desirable that an index should be prepared, giving the particulars of all portions of the scheme in such a manner that they may be instantly found without the necessity of turning over a number of pages. Where this is carefully and thoroughly done, the result cannot fail to be of benefit to the assessors and committee, and incidentally to the competitor.

In some competitions for asylums one requirement is insisted upon—namely, there must be ample arrangements for future extension. When this is the case it appears to be necessary that the competition drawings should not only fully show the buildings to be first erected, but also indicate (not in outline, but in full detail) the arrangements proposed for the wards to be erected in the future. If this be not done, difficulties and disadvantages are likely to manifest themselves later (the various parts of an asylum having so much influence one upon another). For this reason it would be preferable that the competitors should be asked to plan the complete asylum, but with the understanding that certain portions only would be proceeded with in the first instance. A writer upon the subject of extensions has stated that it is much to be desired that “every asylum should be designed and fitted for the full number of patients that it is to contain, and that continual enlargements of an existing asylum should not be permitted. It is not the mere building of the addition and laying-out of its grounds, troublesome and absorbing as these are, that constitute the chief disadvantage of adding to asylums. When the addition is



built, it is found that the old laundry, devised for a smaller number of patients, has become insufficient; then the boiler-power is deficient; it is seen that the recreation-hall is too small, and a proportion of the patients are unable to take part in the entertainments, and so on, through every department. The consequence is that for a certain, usually a considerable, time the patients have to put up with inferior arrangements." Notwithstanding such disadvantages as are above named, there are, in England and Wales alone, about fifteen county and borough asylums at the present time which are being enlarged; the extensions in some instances are of considerable importance, and have necessitated the entire alteration or reconstruction of the administration buildings.

(To be continued.)

## NOTES ON DOMESTIC DRAINAGE.—XI.

### KITCHEN AND SCULLERY SINKS.

THESE should be made of strong white glazed stoneware, free from fire-cracks or flaws of any description. A strong brass grating about 3½ in. diameter should be securely fixed to the outlet of the sink, with a 2 in. diameter trap, having a cone inlet immediately underneath, and connected to a 2 in. diameter lead waste-pipe (see

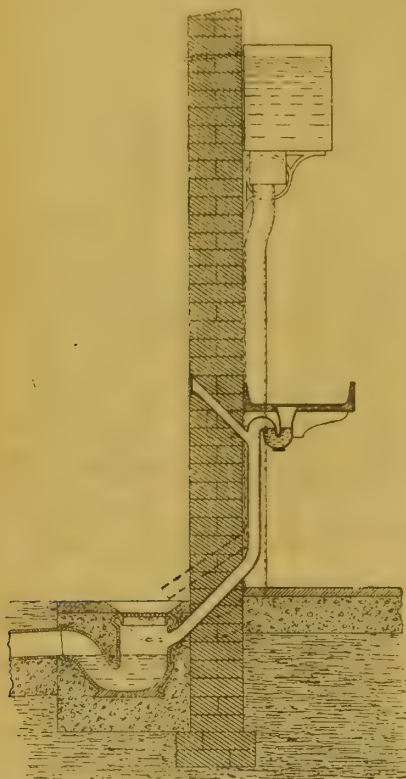


Fig. 51.

Fig. 51). The bottom of the trap should be provided with a screw cleaning-eye for cleansing and inspection purposes. All sinks should be fixed on iron brackets, instead of brick piers or wooden bearers, so as to avoid forming corners and resting-places for dirt. To prevent any risk of siphonage, an air-pipe should be fixed near the top of the trap, and discharge into the open air. The outer end of the pipe should not be placed at a lower level than the top of the sink, and may be provided with cross-wires soldered thereto, or a brass perforated hinged grating may be let in flush with the face of the wall, as shown.

Kitchen or scullery sinks should discharge into a flushing-rim grease-gully, as previously described, the gully and drain being kept free from any accumulations of grease by means of frequent flushing from an automatic flushing-tank. Should it not be practicable to adopt flushing arrangements for this purpose—owing to an intermittent or insufficient supply of water—a grease-trap may be provided, as shown in Fig. 49. The removal of the grease should be carried out systematically and at stated intervals, whilst at the same time all parts of the grease-trap should be thoroughly flushed and cleansed.

### WATER-CLOSETS.

Considerable care must be exercised in the selection of a thoroughly sanitary type of water-closet, for the provision of a defective appliance may be attended with the most serious consequences. Of late years great improvements have been made in their general design and details

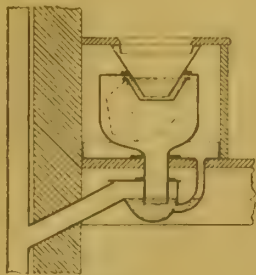


Fig. 52.

of construction; but large numbers of water-closets are being manufactured at the present time which cannot be considered as complying with ordinary sanitary requirements.

All water-closets should be securely trapped close to the outlet of the fitment, so as to prevent the possible entry of impure air or gases from the soil-pipe. This precaution must be supplementary to the provision of a continuous circulation of air at the junction of the closet with the soil-pipe, as already mentioned in connection with the ventilation of the drains. The water-seal, or trap, may form part of the closet fitment itself, or may be fixed separately near its outlet. In either case the efficiency of the trap will be here considered as forming a component part of the sanitary efficiency of the closet as a whole.

For the production of a satisfactory and sanitary water-closet it is necessary that the basin should be capable of retaining within it a volume of water affording sufficient area and depth for the complete immersion of faecal deposits whilst the closet is being used, and the contents of the basin should be capable of being entirely conveyed through the trap into the drain by the discharge of water into the basin; at the same time the basin and trap should be recharged with clean water to permit of the proper use of the closet when next required.

Every portion of the closet, including the trap, must be thoroughly self-cleaning, with all its surfaces perfectly smooth and having no tendency to become fouled by the passing faeces. A satisfactory closet should also be simple in construction, having no intricate working parts which may be liable to get out of order under ordinary use.

Although the type of closet known as the "pan closet" is considered to be practically extinct, yet, notwithstanding all that has been written and said about it, the pan closet is still being made, and—presumably—used. For this reason a slight description of its characteristics are given. The general arrangement is shown at Fig. 52, and consists of a basin with a movable copper pan under, by which a small quantity of water is retained at the bottom of the basin. The pan is

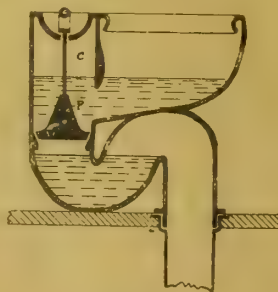


Fig. 53.

pivoted within a large iron container or receiver. On pulling a handle the contents of the pan are discharged into the receiver, a portion of which passes down the dip-pipe into the D-trap below, and from thence into the drain, the remainder being splashed over and adhering to the sides of the receiver and D-trap. This gradually accumulates until both become thickly coated with

decomposing filth. As a consequence, the apparatus becomes permanently insanitary, and each time the pan is emptied quantities of impure air and gases escape from the container into the room. A more insanitary form of closet could scarcely be devised.

A class of closet known as the "plunger" or "plug" closet was at one time extensively used (see Fig. 53). A satisfactory area and depth of water is retained within the basin by means of the plug or plunger P. The basin is capable of being flushed in the usual manner, but the plunger chamber C is not self-cleansing; the sides of the chamber and plunger are liable to become furrowed with faeces, the deleterious gases from which escape into the apartment at the opening for the handle. This class of closet is also sometimes fixed without a siphon trap between the soil-pipe and the basin, and is then known as a "trapless" closet (see Fig. 54). In this case the only safeguard for preventing the entry of impure air from the drains into the house is that afforded by the plunger and the water above it. Should a small piece of paper or other substance prevent the plug from resting tightly upon its seat, the water above gradually escapes into the drain, and impure air is then free to enter the building—it may be, with disastrous results.

The "valve" closet is a very satisfactory form of closet for domestic use, provided that a really good and well-made appliance is obtained. Many of those now being extensively sold will be found, on examination, to be faulty in design or workmanship, though they may have the questionable merit of being cheap in their first cost. A good valve closet is necessarily expensive, owing to its mechanism, and unless it is intended to use only a high-class valve closet, fixed in a complete and proper manner, they are better avoided altogether.

The general construction of a valve closet is shown in Fig. 44, and consists of a glazed

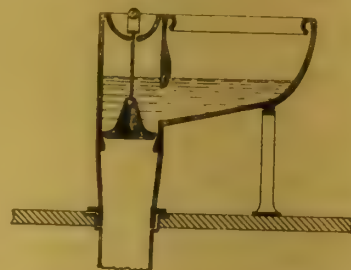


Fig. 54.

earthenware basin, with an iron valve-box under, and directly connected to a lead siphon-trap secured to the soil-pipe. One of the great advantages of this type of closet is that a large volume of water, having ample depth and surface area, is retained within the basin. In fact, the surface area of the water is generally greater than the opening in the seat, so that all faecal deposits fall directly into the water-pool without soiling the sides of the basin, or allowing unpleasant odours to be given off from the exposed faeces. After use, the basin is completely emptied of its contents, and the apparatus, including the trap, is well flushed, whilst a sufficient quantity of clean water is retained within the basin for its satisfactory use on the next occasion. Amongst the details connected with the selection and fixing of an efficient valve closet, the following may be noticed.

1. All valve closets must be provided with a self-cleansing siphon-trap of good construction, immediately under the valve-box.
2. A ventilating pipe (usually known as a puff-pipe) must be provided to the valve-box and carried through an outer wall into the open air.
3. An anti-siphonage pipe should be provided on the soil-pipe side of the closet-trap. For a single closet this may be connected to the soil-pipe, as shown in Fig. 44, but in the case of a vertical series of closets the anti-siphonage branch from each closet is connected to a vertical pipe and afterwards to the soil-pipe above the highest closet, as previously described and shown in Fig. 45.
4. A lead safe should be provided under each closet, having a waste-pipe discharging into the open air, the outer end being provided with a brass or copper hinged flap.
5. The overflow from the closet basin should discharge on to the lead safe beneath, as shown in



Fig. 44. Where this plan is adopted slops should never be emptied into the closet, otherwise there is great danger of organic matters being allowed to overflow and decompose within the lead safe should the closet be carelessly used. Whenever

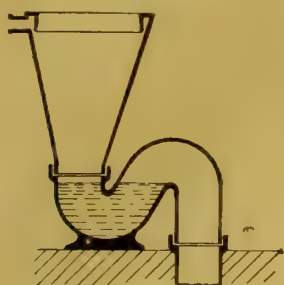


Fig. 55.

there is any risk of the valve-closet being used as a slop-closet or housemaid's sink, the following arrangement should be substituted. The overflow pipe should be trapped and discharge into the ventilating pipe from the valve-box, as shown in Fig. 45. It should never be allowed to discharge directly into the valve-box. The overflow pipe must also be arranged to receive a small quantity of clean water on each occasion that the closet is flushed, so that the water seal of the overflow trap may be kept intact, and the whole of it should be easily accessible for cleansing purposes if required.

6. Where the local circumstances are such that a water waste-preventing cistern must of necessity be used in place of the ordinary supply-valve and bellows regulator usually attached to the closet under the seat, the waste-preventing cistern

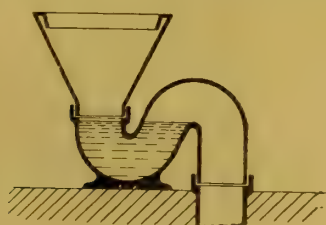


Fig. 56.

should be capable of giving a "flush" and "after-flush," so that the basin may be left with a proper quantity of water within it.

7. The inclosure to the closet should not be "fixed" or screwed down. The seat should be hinged, and the front or riser capable of being readily removed, so that the whole space may be properly cleaned from time to time.

Attention to these and similar details are necessary if an effective and satisfactory valve-closet is desired.

The "hopper" form of closet, in its most primitive form, consists of an earthenware basin with a trap immediately under the outlet. The basin takes the shape of an inverted cone or "hopper"—hence the name. Hopper closets are known as "long" and "short" hoppers, according to the depth of the basin. Figs. 55 and 56

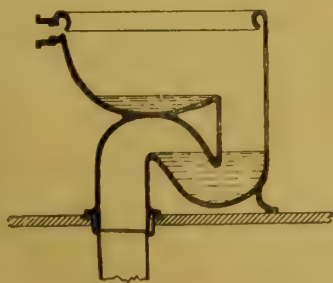


Fig. 57.

are sketches of a "long" and "short" hopper closet respectively. The "short-hopper" closet is frequently used for servants' closets and cottage property. It is cheap and simple in construction, but cannot be considered as complying with modern sanitary requirements. The surfaces of the basin are easily fouled and insufficiently self-

cleansing, even when a flushing rim is provided in lieu of the usual flushing arm. The exposed water surface at the bottom of the basin is quite insufficient; whilst the area of the sides of the basin is so comparatively large that it is almost impossible to use the closet without soiling the sides. The result is that the ordinary two-gallon water flush given to these closets is quite incapable of overcoming the tenacious adherence of the faeces to the sides of the basin, and, under normal conditions, the closet permanently remains in a more or less foul and insanitary state. With regard to the "long-hopper," it will be noticed that the same defects are apparent, but in a much greater degree.

Some few years ago a class of closet known as the "Wash-out" was introduced, and at one time most extensively used (see Fig. 57). The closet is designed to allow of a shallow pool of water always remaining at the bottom of the basin for the reception of faecal deposits. The surface area of the water pool is satisfactory, but the depth quite insufficient to permit the faeces being properly immersed without soiling the bottom

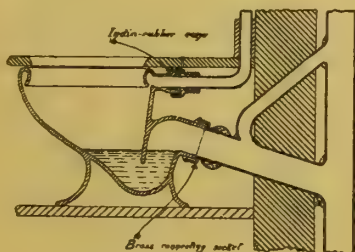


Fig. 58.

and lower portions of the sides of the basin. The ordinary flush of water rarely removes all traces of the faeces which have thus soiled the basin. The force of the flush is also in a great measure expended in surmounting the weir formed in the basin, leaving insufficient energy to properly cleanse the outlet and trap under. As a consequence, instead of the closet-trap being charged with clean water, it frequently retains a proportion of decomposing faecal matters, whilst the sides of the basin outlet becomes gradually furrowed with the passing faeces, so that the whole appliance is rendered most insanitary.

Another form of closet, known as the "wash-down" closet, is shown at Fig. 58. This is essentially a modification of the short hopper and

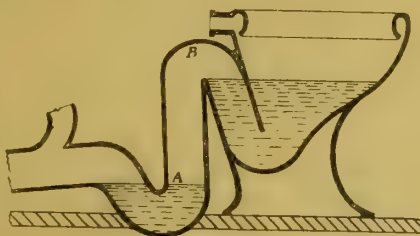


Fig. 59.

trap, and when of good design is a very satisfactory closet for general purposes. A fairly large water surface may be obtained within the basin, together with sufficient depth for the immersion of the faeces, whilst the continuously sloping sides of the basin allow the full force of the flush being brought to bear upon the trap with a thorough scouring and cleansing action.

In many of the wash-down closets now being manufactured, the water surface in the basin is far too small for sanitary efficiency, and they are consequently very little better than the common form of short hopper closet in that respect. A well-designed wash-down closet should provide a water pool of good depth and ample surface, together with a thoroughly self-cleansing trap. The back of the basin should be nearly vertical, whilst the outlet of the trap should be arranged not only to allow the connection with the soil-pipe being properly and easily made, but to admit of it being at all times accessible for examination. It is desirable that wash-down closets may be of the pedestal type, in order to give adequate support to the upper portion of the fitment, and to allow the seat to rest directly upon the closet without the use of seat brackets.

They should be fixed without any inclosure, the whole of the apparatus being exposed to view in order that it may be thoroughly cleansed in every part, no hidden corners being left for the gradual accumulation of dirt.

The description of closet known as the "siphonic-action" closet is of comparatively recent introduction. Fig. 59 shows the general arrangement of this type of closet. The outlet of the basin takes the form of a bent tube or siphon-pipe, the long leg of which is connected to a trap (or, in some instances, a weir) attached to the soil-pipe. On flushing the closet, siphonic action is set up, and the contents of the basin are siphoned or drawn out, instead of being thrust out by the force of the water-flush. Nearly all manufacturers of siphonic-action closets adopt different arrangements by which the air is expelled from the siphon pipe in order to set up siphonic action, this object being oftentimes attained in a highly-ingenuous manner. In one well-known closet of this description, a small puff-pipe is fixed just above the water-seal of the trap (at A, Fig. 59) through which the air is expelled by means of the rapid discharge of water (at B) down the long arm of the siphon-pipe. In some forms of "siphonic-action" closets, waste water or slops must not be discharged into the closet for fear of setting up siphonic action, and so leaving the closet with little or no effective water-seal between the soil-pipe and the fitment.

By the use of a siphonic-action closet, ample depth of water is obtained in the basin together with a large water area, whilst the contents of the basin are thoroughly drawn out. Great care is necessary, not only to select a thoroughly good form of closet embodying this principle, but also to insure that it is properly fixed for use.

## THE TIMBERS OF AUSTRALASIA.—V.

HARDWOODS (continued).—II. QUEENSLAND.

AFTER what has been said of the hardwoods of New South Wales in the preceding articles, there can be no necessity to speak afresh of the same timbers, simply because they are common to others of the Australian colonies, unless where there happens to be some marked difference in quality from what has already been described, or some particular circumstance connected with them which demands notice. Two things, however, are incumbent on me. The first of these is to indicate the general distribution among the six Australian colonies of the hardwoods suitable for export; the second, to enumerate such important timbers of this description as do not belong (or only in a minor degree) to the mother colony. The former of these objects may be best and most simply attained, perhaps, by means of the subjoined table which I have compiled from the most recent information obtainable from various authoritative sources, and some of which has been either published or sent me since these articles were first undertaken. In this table, it will be observed, New Zealand is conspicuous by her absence; but separated as that colony is from the Australian continent by a thousand miles of ocean, and enjoying generally a higher latitude, with (in many parts, especially of the South Island) a much greater elevation above sea-level, her flora is quite distinct from that of Australia (which is generally taken to include the island of Tasmania), and the whole family of Eucalypts are non-indigenous there, though the blue and other gums have been introduced with great advantage and success, flourishing amazingly in the more southern climate, and becoming even harder than under their native conditions.

Passing now to the second task—viz., consideration of those hardwoods in the possession of which the mother colony does not figure prominently (if at all), we have first to take the great north-eastern colony lying immediately adjacent to New South Wales, and occupying almost the same longitude—namely,

### II.—QUEENSLAND.

The knowledge of the timbers of Queensland is probably the most backward, both scientifically and commercially, of any of the Colonies; so much so, that the Colonial Botanist, Mr. F. Manson Bailey, in his last annual report to the secretary for Public Lands and Agriculture, draws public attention to the subject. He says:—"I would again urge upon your notice the necessity of some further effort being made at collecting specimens of the indigenous flora, and



particularly the woods. Up to the present only about 600 are known, and I have no hesitation in saying that 1,000 exist." Mr. Bailey likewise emphasises a matter to which I drew attention in the opening of my second article (page 221 *ante*)—viz., the importance of employing the Latin, or botanical, names of timbers, observing: "I would ask that no public money be spent in collecting wood samples for the European market, except such have attached to each sample the scientific as well as the vernacular names. It must not be thought that, in making this request, I am speaking more as a botanist than as an artisan. All who have had to do with our woods will agree with me in saying that the vernacular name alone is useless, or even worse, for so frequently the same vernacular name is given to very dissimilar woods." The more extended information so properly desired by the Colonial Botanist of Queensland would not, however, in all probability, materially affect the knowledge which already widely exists—viz., that the hardwoods indigenous to his colony are very much the same as those native to the adjoining coastal colony of New South Wales; or, in some cases, to the Northern Territory of centrally-situated South Australia, which occupies the same latitude west of the Gulf of Carpentaria as the northern portion of the Tropical part of Queensland. It is true that some of the experts in the mother colony assert that the Queensland hardwoods are sappier and altogether inferior to their own; but, on the other hand, the Hon. W. Pettigrew, M.L.C., the experienced head of, I suppose, the leading firm of timber merchants, saw-millers, &c., in the colony, wrote to me not long since from Brisbane, that while the Queensland hardwoods were rather higher in price than those of New South Wales, they were certainly more durable, and therefore cheaper in the end. Such a conflict of testimony may probably be reconciled by the assumption that the difference between the value of the timbers of the two colonies depends upon the particular place of their growth, the conditions under which they were felled, and the judgment used in their selection. If this assumption be, as I believe it to be, correct, the fact must form a powerful argument in favour of the course lately urged upon the Board of Export Trade of New South Wales by a deputation representing a conference of the leading saw-millers and timber merchants, that all timbers exported from the colony should be capable of being properly graded by a qualified Government expert prior to shipping, whereby the genuineness and quality of all superior timbers would be guaranteed, and the freight be saved on inferior and consequently rejected woods.

Several timbers, however, are, practically speaking, peculiar to Queensland. One of these is the bloodwood (*E. corymbosa*), so called from the large quantity of a blood-like fluid (gum or "kino") which exudes from the tree, and which, when indurated, produces the concentric gum-veins so common in the poorer qualities of this timber. It is fairly plentiful in New South Wales, in the coastal districts and on the Blue Mountains; but there it is usually so full of these gum-veins, and consequently so liable to "shell," that it is worthless, except for such local purposes as fencing-posts, &c., and I have not, therefore, included it among the exportable timbers of the mother colony. But in Queensland, where its native name is "Boona," it grows in a greater variety of soils and places than almost any other tree. It is found on the richest soils and on the poorest, in swamps, and on the tops of ridges. The timber of the rich soils, however, is as worthless as that of New South Wales, and for the same reason: the good sound trees grow on poor soil. But, when well selected, bloodwood is all but imperishable in or on the ground, and possesses the advantage of not splitting at the ends when exposed to the sun, as many of the hardwoods do. It is consequently suitable in a marked degree for the construction of wharves and culverts, and would probably be equally well adapted for railway sleepers and wood paving. For the story-posts of buildings it is one of the most durable timbers known, as it is not readily attacked by the white ant, and catches fire with difficulty. There was till lately a piece of bloodwood still lying on the ground at the North Pine river which was known to have been cut into by a cross-cut saw and axe in 1825. With reference to this Mr. Pettigrew writes to me:—"I saw the marks referred to in 1877, shortly before writing a paper on 'The Habitat and Peculiarities

DISTRIBUTION THROUGHOUT THE AUSTRALIAN COLONIES OF THE HARD WOODS  
SUITABLE FOR EXPORT.\*

Botanical Name.	Vernacular Name.†	Habitat.‡
<i>Eucalyptus paniculata</i> ...	Ironbark (white or "she")	N.S.W., Q., Vic.
" <i>crebra</i> .....	" (narrow leaved)	N.S.W., Q., Tas.
" <i>siderophloia</i> .....	" (broad leaved)	N.S.W., Q., Vic.
" <i>sideroxylon</i> .....	" (red flowering)	N.S.W., Vic.
" <i>capitata</i> .....	Stringybark (silvery)	N.S.W., Q., Vic., S.A.
" <i>Eugenioides</i> .....	" (white)	N.S.W., Q., Vic.
" <i>Muelleriana</i> .....	" (yellow)	Vic.
" <i>macrorryncha</i> .....	" (red)	N.S.W., Q., Vic., S.A.
" <i>obliqua</i> .....	" messmate	N.S.W., Vic., S.A., Tas.
" <i>rostrata</i> .....	Red gum (River Murray)	N.S.W., Q., Vic., S.A., W.A.
" <i>teretiorinis</i> .....	" (Forest)	N.S.W., Q., Vic.
" <i>calophylla</i> .....	" West Australian	W.A.
" <i>globulus</i> .....	Blue gum (Victorian or Tasmanian)	N.S.W., Vic., Tas.
" <i>saligna</i> .....	" Sydney	N.S.W., Q.
" <i>megacarpa</i> .....	" (West Australian)	W.A.
" <i>leucoxylon</i> .....	White gum (or South Australian blue gum)	Vic., S.A.
" <i>redunda</i> .....	" West Australian	W.A.
" <i>goniocalyx</i> .....	Grey gum (or pseudo blue gum)	N.S.W., Vic., S.A.
" <i>Ravertiana</i> .....	" (Queensland)	Q.
" <i>maculata</i> .....	Spotted gum	N.S.W., Q.
" <i>corynocalyx</i> .....	Sugar gum	S.A.
" <i>viminialis</i> .....	Manna gum	N.S.W., Vic., S.A., Tas.
" <i>loxophleba</i> .....	York gum	W.A.
" <i>hemiphloia</i> .....	Box (white)	N.S.W., Vic., S.A.
" <i>meliodora</i> .....	" (yellow)	N.S.W., Q., Vic., S.A.
" <i>largiflorens</i> .....	" (black)	N.S.W., Vic., S.A.
" <i>microtheca</i> .....	" bastard	N.S.W., Q., S.A., W.A.
" <i>polyanthema</i> .....	" (true red)	N.S.W., Q., Vic.
" <i>botryoides</i> .....	" (red, or Victorian mahogany)	Q., Vic.
" <i>resinifera</i> .....	Mahogany (forest)	N.S.W., Q.
" <i>robusta</i> .....	" (swamp)	N.S.W., Q.
" <i>acmenoides</i> .....	" (white)	N.S.W., Q.
" <i>amygdalina</i> .....	Ash (mountain)	N.S.W., Vic., Tas.
" <i>Sieberiana</i> .....	" ( " or gum top)	N.S.W., Tas.
" <i>stricta</i> .....	" (white)	N.S.W.
" <i>tescellaris</i> .....	" (Moreton Bay)	N.S.W., Q., S.A.
" <i>pilularis</i> .....	Blackbutt	N.S.W., Q., Vic.
" <i>microcorys</i> .....	Tallow-wood	N.S.W., Q.
" <i>Stuartiana</i> .....	Queensland Tea-tree	N.S.W., Q., Vic., Tas.
" <i>marginata</i> .....	Jurrah	W.A.
" <i>diversicolor</i> .....	Tuart	W.A.
" <i>goniophleba</i> .....	Tuart	W.A.
" <i>cornuta</i> .....	Yate-tree	W.A.
" <i>corymbosa</i> .....	Blood-wood	N.S.W., Q., Vic.
" <i>longifolia</i> .....	Woollybutt	N.S.W., Vic.
" <i>longicornis</i> .....	Morell-tree	W.A.
" <i>salubris</i> .....	Gimlet-wood	W.A.
<i>Synceuria laurifolia</i> .....	Turpentine-tree	N.S.W., Q.
<i>Tristania conferta</i> .....	Brush Box	N.S.W., Q.
" <i>suaevoloris</i> .....	Queensland Swamp Mahogany	N.S.W., Q., S.A.
<i>Gmelina Leichhardtii</i> .....	Beech (or Leichhardt-tree)	N.S.W., Q.
<i>Eleocarpus Kirtonii</i> .....	" (white)	N.S.W., Q.
" <i>cyanea</i> .....	Blueberry Ash	N.S.W., Q., Vic., Tas.
" <i>Baneroftii</i> .....	"	Q.
<i>Backhousia Baneroftii</i> .....	Johnstone River hardwood	Q.
<i>Leptospermum lanigerum</i> .....	Tea-tree	N.S.W., Q., Vic., S.A., Tas.
" <i>leucadendron</i> .....	" (swamp)	N.S.W., Q., Vic., Tas.
" <i>leucadendron</i> .....	" (white)	N.S.W., Q., S.A. (N. Territory), W.A.
<i>Myrtus acmenoides</i> .....	White Myrtle	N.S.W., Q.
" <i>gonoclada</i> .....	Ironwood	Q.
<i>Angophora intermedia</i> .....	Narrow-leaved apple-tree	N.S.W., Vic., Tas.
<i>Owenia venosa</i> .....	Sour plum	N.S.W., Q.
<i>Calistemon salignum</i> .....	Bottle-brush (or stonewood)	N.S.W., Q., Vic., Tas.

\* This table is intended to indicate where the various timbers are to be found, not where they flourish the best and attain the soundest condition. For this latter information the letterpress must be consulted, under the headings of the respective colonies.—D. L.

† Out of (in many cases) a multiplicity of vernacular names, I have selected those which seemed the most reasonable (or least unreasonable!), the best established, and the least likely to lead to confusion. But the only possible way of avoiding that is to use the botanical names.—D. L.

‡ "N.S.W." signifies New South Wales; "Q." Queensland; "Vic." Victoria; "S.A.," South Australia; "W.A.," Western Australia; and "Tas.," Tasmania.—D. L.

of Our Timbers" (which he read before the Queensland Philosophical Society). "The last time I saw it was in 1889, and it was still sound. I then noticed that it was a limb, and, looking about, saw the tree and place from which it had been broken off. Since then it has been burned by a bush fire." This is high testimony to the endurance of bloodwood. In colour the timber ranges from a dirty white to yellow. When green it is soft and spongy, but it dries hard.

The Queensland grey gum (*E. Ravertiana*), called also "iron gum" and "Thoset's box," and named after M. Ravet Wattel, the author of "L'Eucalyptus: son Introduction, sa Culture," &c., is regarded by the Rev. J. E. Tenison-Woods, F.G.S., vice-president of the Linnean Society of New South Wales, as "one of the most valuable timber trees of the Tropics," though unfortunately it is not very plentiful. It is a truly noble tree, attaining a height of 300ft. with a diameter of 10ft., and towering over every other gum on the banks, and even in the bed, of the rivers. It is a highly durable timber, dark-coloured, excessively hard—so hard that the platelayers of the Queensland Central Railway complained that it destroyed their tools—and valuable for underground piles, railway sleepers, and many other purposes, as it resists the heaviest blow. The wood is close-grained, and without any interstices filled with gum, but is usually speckled with white, which gives it an agreeable mottled appearance, and as it takes a splendid polish, it is well adapted for the purposes of joinery and cabinet furniture where much hard wear is required, such as the fittings of ships' cabins, railway carriages, &c.

The Moreton Bay Ash (*E. tescellaris*), called by the natives "Corang" and "Corbeen," is frequently a less durable timber than most of the Eucalypts, and the statements as to its value are conflicting. The reasonable deduction, therefore, seems to be that a hot climate is essential to the complete development of this species as a hardwood. Indeed, the wood is generally tough, rather than hard, and of a dark-brown colour, except near the bark. But in the Torrid regions about Townsville, Charter's Towers, and Rockhampton (in some of which places the shade temperature last January reached 135°) the timber is highly esteemed and used for a large variety of purposes, though its most important employment is for flooring, on account of its elasticity. Under any circumstances, however, it is advisable to use the heart-wood only, as there is little doubt that the sap-wood is liable to decay.

The White Tea-tree (*Melaleuca leucadendron*) is met with in various parts of Northern Australia, growing in salt swamps where no other Eucalypt will live; but it attains its best development about the Mitchell River, in North Queensland. It belongs to the same Natural Order as the *Eucalyptus* (*Myrtaceae*), is known by at least half-a-dozen different vernacular and aboriginal names, and, like most of the other species of the same genus, it yields an essential oil closely resembling the medicinal oil of Capeput of India, obtained from the *Melaleuca minor*. Indeed, more than one distinguished botanist has considered it to be the same tree. The timber is hard, heavy, and close-grained, excellent for shipbuilding, and specially capable of resisting the damp of the ground. One of its appellations ("paper-bark



tree") is derived from the papery nature of the cortex, which is not only of greater durability than even the wood itself, but is absolutely impervious to water (as has been shown in cases where the undecorticated timber has been used for dam and drainage purposes), and appears to be equally fire-resistant. When brought to a surface, the wood shows a singularly beautiful combination of light and darker shades, which produce the appearance of a ripple.

Blackbutt (*E. pilularis*) has already been described in connection with the hardwoods of New South Wales. I refer to it, however, again, in consequence of its great abundance in Queensland, where the aborigines call it "Toi." It grows best close to the coast on the sandy ridges, and from the Caboolture River northwards to the Mary River, and including Frazer's Island, it exists in enormous quantities. But it is by no means limited to these localities. It is found in West Moreton, on the Main Range, at Highfields, and in many other places where the ground is well drained and moist sands are plentiful, both these conditions seeming to be requisite for the full development of the tree in Queensland. In that colony blackbutt enjoys the very highest estimation for house-building and many other purposes. It is there considered admirably adapted both for the planking of vessels and for railway sleepers, and has been found to stand perfectly in the wooden rails of the railway at Tin Can Bay. It should, therefore, form one of the safest and best hardwoods for export from the great northern colony—one on which the most complete reliance can be placed by foreign importers—so soon as she devotes a little more attention to her valuable timber resources than she appears to have done up to the present time.

Growing with blackbutt in the Mooloolah country, and to the southward, is a species of turpentine (*E. Stuartiana*), the native name of which is "But-but," while it has some half-a-score vernacular names as well, of which, perhaps, the best to adopt is "Queensland Tea-tree." It is found mostly on sandy or gravelly ridges, and is extremely durable underground. It is not particularly abundant, but it grows very rapidly. It is little in demand for one of the great uses of all timbers in the colonies—viz., for the extensive fencing which takes the place occupied by the hedges and ditches so characteristic of England—as it is very difficult to split. But, as it is no less difficult to burn, it is strongly recommended for railway sleepers, bridge-work, the planking of vessels, and similar purposes. It answers well, also, for the rougher kinds of furniture, as it readily takes a polish. There is likewise a swamp mahogany, called by the natives "Boolerchu," which grows on swampy or poor wet land, and is mentioned by Mr. Pettigrew as an undefined species of *Angophora*. Probably, however, it is what is known in the sister colonies as *Tristania swarolens* (Nat. Or. *Myrtaceæ*). At all events, the Queensland swamp mahogany seems to possess but one single merit, as "it cracks and twists into all manner of shapes when cut into boards or planks." This sole and particular merit, according to Mr. Pettigrew, is that "it resists the colera longer than any other timber, so far as is yet known." That, however, is rather an *ex parte* statement, which, while it doubtless contains a modicum of truth, requires, I think, to be taken with the traditional "grain of salt." But I shall have something further to say about the resistance of various timbers to the colera when I come to the colony of Western Australia and her famous jarrah-wood. One thing is certain: "Boolerchu" is used extensively in Queensland, not only for piles, but for coach-building and other purposes, and is elastic, close-grained, tough, strong, and durable, with a red colour resembling that of Spanish mahogany. The brush box (*Tristania conferta*) is very plentiful on the ridges near Brisbane, and is a persistent grower there, springing up afresh from the roots when cut or burned down. But though fit for heavy constructional work, and a durable timber for railway sleepers, it is not to be relied on for general purposes, like the wood of the same tree when growing in New South Wales. Mr. Pettigrew utters a warning against its inconsiderate use, declaring it to be "of no account for sawing, as it twists and gets uneven."

DE LEEBA.

(To be continued.)

The Calverley U.D. School Board have adopted plans by Messrs. W. and J. R. Bailey, of Bradford and Keighley, for new schools to be built at Farsley.

## "BUILDING NEWS" DESIGNING CLUB.

A VILLAGE PUBLIC-HOUSE.

THIS distinctly picturesque subject has not called forth such designs as we had hoped to have seen, and neither of the competitors comes up to our expectations. "The Owl" is the best, and "Tadpole" takes the second place, while "Clansman" ranks third. The special treatment suggested by a plastered and whitewashed finish for the exterior of this building has not been successfully realised by "The Owl," while "Clansman" has scarcely allowed the material to influence his design at all; indeed, red brick, at any rate up to the eaves line, would seem to be the natural material for his elevations. The conditions really suggested something more original than this, and a less regulation type of work ought to have been adopted. The instructions were as follows:—A village public-house by the highway, on a triangular site, with a small triangular grass plot in front. The front line of building to be set back from apex far enough to give a frontage of 60ft. as the limit for building; the site being bounded on both sides by a road, at an angle of 60° to the frontage. The house to be treated externally in rough-cast plastered work, with pantiled roofs and wide eaves. Walls whitewashed. The accommodation to comprise a small private bar, and also a bar parlour of about 20ft. by 18ft., a smoking-room of similar proportions, a billiard-room for one full-sized table, and on first floor a good room suitable for club and other meetings, measuring about 30ft. long by 18ft. wide. There must be a couple of good bedrooms for visitors off the same main landing, and four or five bedrooms for the household. A large living-room kitchen to be attached, and at the back a wash and bake-house, scullery, larder, and pantry. The stable to afford standing for six horses, and a coach-house in proportion. The approach to the stable-yard is to be made a feature of in the centre of the façade or thereabouts. The sign of the Red Lion is to be suitably introduced. Scale for elevations, 8ft. to the inch; for plans, 1-16in. to the foot. A view necessary. Sufficient other drawings to illustrate the house, and the section may be shown to same scale as plans. Economy to be remembered.

It is not at all clear to us why "The Owl" should have cut up his front by lowering the eaves and altering the height of the roof to the left hand of his façade next the chimney, and why the buttress by the side of the central covered-way is permitted to divide the building into two is also open to doubt. The plan is clever, and in many respects it is convenient. There is a degree of quaintness, too, about his elevations, and the drawings exhibit ingenuity and thought. Whether the scheme is a suitable one, is, however, a matter of opinion upon which we have nothing useful to add. "Tadpole" adapts his plans to the triangular site by a series of set-offs planned at right angles with the façade. He isolates his club-room rather better; but the occupier of the bedroom adjacent to it would probably be as much disturbed by late convivialities as in "The Owl's" plan, where the club-room is reached immediately off the same corridor as the bedroom. The bars, particularly the private bar, are badly planned by "Tadpole," and nothing could be more inconvenient than the narrow space in his plan for the customers in this department. The first floor is, however, much better contrived. "Clansman" treats his gables with half-timber, and cramps all his entrances in a needless way. His elevations are better than his plans, which are crude. The same may be said of "Invicta," who, contrary to the rules, sends three sheets. His elevations, though delineated in a restlessly fanciful and ineffective style, are more in keeping with the spirit of the rough-cast style of building than the majority of schemes submitted in this competition. The homely and cottage-like character has been, perhaps, a little overdone, making the block of building look too much like a public-house with two cottages attached. The plan, on the other hand, suggests a cheap tea-garden tavern, and the stable-yard is very ill considered. "Saxon" is very ordinary, with that negative quality, perhaps, as his leading recommendation. His plan, at any rate, is convenient, with a service stair to the club-room, which is better contrived and more shut off from the rest of the house, which is an advantage. "Potboy" is odd or nothing, and his oddity, as a matter of fact, has little to recommend it. The sloping buttresses are overdone, and so are the round-arched recesses and openings. The

plans, also, are cut up and inconsequential, with a staircase-well opening over the private bar, which would be most inconvenient, and likely to lead to all kinds of mischief and horseplay from the landing leading immediately out of the club-room. The drawings show that "Potboy" ought to do better; but as it is, they, too, are very indifferent. "Thistle" is less ambitious and more careful, with a better idea of public-house requirements. The clubroom is nicely isolated, and has a servery, though that intermingles with the visitors' bedrooms in a questionable manner. The view is inky, and would not reproduce well with so many rotten lines. "Mac" has overdone his perspective, and he makes his bar-parlour a regular saloon, with wall seats on all sides. The plan, generally, is not very convenient, though we note the care displayed by "Mac" in several minor particulars. "Demetrius" exhibits more breadth, and his design would look better in execution than it does in these thin and rough drawings; but his plan is crude, and lacking in thought. "Punt" gives a paltry look by using a red ink as a sort of pun for his "Red Lion Inn." The two entrances flanking the yard-archway are needless and confusing. An old tavern would have had these doorways located in the return walls of the carriage-way, and seeing that there are already two secondary entrances beyond, these two in the façade are quite superfluous. The plan is too disjointed to be good, and the plasterwork proposed is not specially handled. The three plain gables in "Oberon's" design are its best feature; but the whole thing is indifferently shown, the general effect being flimsy and overdone. The breadth and simplicity of "Friar's" contribution are quite a relief; but there is an amateurishness about the contrivance, showing a want of technical knowledge which it is not easy at first sight to understand. The inconvenient porch to the bar parlour, the arrangement of the bar itself, and the cramped larder under the stairs evince an absence of acquaintance with domestic conveniences, as well as little regard for public-house utility. The w.c. opening directly out of the billiard-room, with its door facing the entrance to the apartment shows no sense of delicacy or sanitary fitness. Architecturally, the design may be described as a mild edition of Mr. Ernest George's picturesque style. "Giles" is likewise commendably plain in his exterior façades; but the fenestration adopted gives a doll's house look to the structure, which, in the perspective, seems to be built of cardboard with no reveals whatever to the central archway. Such essays as these display a certain degree of taste and reserve in design; but we must add they also exhibit a lamentable ignorance of the first principles of good building. "Breton," less refined in idea to the last named, has a bad plan, and a pair of big oversailing gables treated with timberwork. "Veller" sends a sort of villa flanked by a triumphal arch, which is sadly out of keeping. The porch is really ugly. "Kaffir" spoils his chances by sending in such trivial perspectives as this trumpy one. The shutters along the front to the ground-floor windows give quaintness, and the uninterrupted and unbroken wall surface is distinctly meritorious; but the circular bay over the yard entry with its dome-shaped roof is childish and poor. "Pantile" will never make a good planner if he does not improve. We find it difficult to discover any good points to enumerate and by naming which some encouragement might be offered to such contributors as those now under consideration, to induce more serious endeavours from them. "Study good men's work" is good advice, and, above all, take note of old examples of village building. Their unambitious plainness is their chief charm, and in this climate a well-contrived skyline must always be a prime consideration. The remaining designs are by "Trush," "Pickwick," "Canary," "Fac et Spera," "La Cigale," "Feasgar," "Moor," and "Venus."

## ALTERATIONS TO OLD BUILDINGS IN LONDON.

ONE section of the London Building Act, 1894, has doubtless become rather a thorn to many builders and owners—we mean that which states that every addition to, or alteration of, a building, and any work done for any purpose into or upon a building (except that of necessary repair not affecting the construction of any external or party-wall) shall be subject to the provisions of the Act and bylaws. The clause



thus briefly stated existed in the old Act, and caused many disputes; whenever, in fact, a builder made any addition or alteration to an old building which involved some tampering with an external or party-wall. It happened, however, that the evasive builder sometimes managed to avoid the consequences of his action by pretending that the work was of the nature of a repair. Following this section is the new one, to the effect that a building erected before the commencement of the new Act, and to which no objection could have been taken under any law then in force, shall, subject to certain provisions as to new buildings or alterations of them, be deemed to be erected in compliance with this Act. This clause exempts obviously many works from the operation of the previous section. The question raised in a recent case is of interest to architects and building owners. The defendants were summoned before Mr. Bros for not serving a notice on the district surveyor of Hackney before erecting a hydraulic lift at the new block of the Hackney Workhouse. In erecting a lift, the defendants had cut into the external walls for the purpose of fixing some girders, and had drilled a  $\frac{1}{4}$  in. hole in the stone staircase for a bolt, in, it is alleged, contravention of Section 209, which we have referred to. The surveyor, in his evidence, stated that any work affecting an external wall necessitated a notice being given. On the defendants' side it was stated that the firm had erected hundreds of similar lifts in all parts of London, and never had any district surveyor insisted on notice. The magistrate said that, in his opinion, there was in the new Act a much more stringent provision than in the old Act; and in view of the provision that in any public building notice must be given when any external or party-wall or staircase was affected, he came to the conclusion that he must find in favour of the district surveyor. As it was a new question, he should only impose a small penalty of 20s. with costs, and he agreed to state a case for the opinion of the High Court.

If this decision is upheld, it will show to what an extent, under the new law, alterations can be made. Various questions are likely to be raised as to the operation of this section, and as far as we can see there will be some difficulty in defining what can be done to an external wall without the interference of the district surveyor. The construction of lifts in buildings often necessitates certain cuttings, chases, and apertures to be made in external walls, which in some cases may weaken them. To all such cuttings there must be a limit, and it is reasonable to insist that notice should be given to the surveyor, as these are works which affect the construction of external or party-walls. Simply driving a nail into the wall, or taking a brick out of an external wall for scaffolding, are operations which, as the district surveyor intimated, would not affect the strength of the structure, and would not be interfered with by him. Any practical man will readily understand that while there are certain operations which might be allowed without weakening a brick wall, there are others that would undoubtedly tend to destroy the bond or to cause vibration. But the builder engaged in making an alteration is the last person who troubles himself about the precise nature of any work of this kind. He finds certain cuttings necessary to insert girders or other fixings; forthwith these are made without any thought of injury, or whether the same is a contravention of the rules. We believe under the old section numerous works of this kind have been done without notice; cuttings have been made through walls for girders and joists or pipes, and excavations have been made perilously near foundations of party-walls.

But, as the magistrate says, the section of the new Act is much more stringent than formerly, and it is therefore to the interest of the profession to see that notices are given. Certain work has, indeed, been held to be exempt from the clause, such as an addition or alteration to a building itself exempt from the operation of the Act, so long as the addition or alteration does not bring it within sect. 206, which states that the building is privileged so long only as it retains the character by reason whereof it is so exempt. Substituting a new door-frame for an old one in an external wall may be done without being subject to the provisions, so long, indeed, as the doorway is not enlarged. We may expect to hear many other rulings as to this and other clauses. Those which appertain to the conversion of buildings (Section 211) will doubtless exercise the

Council and the Courts; among them the conversion of buildings originally exempted from the Acts into uses which would make them amenable to the law. Many old houses and buildings which have evaded all by-laws have been turned into buildings for other uses without authority, and it will still require much vigilance to stop the same class of innovation.

#### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XV.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE finest concert-hall in the centre of London is the Queen's Hall, a plan of which (Fig. 1) I produce here, having taken it from one that was published some few years back. I have had the advantage of going over this hall very many times. Mr. C. J. Phipps, F.S.A., one of the architects engaged on this building, who was responsible for the planning, but not for the architecture, has shown great knowledge of the requirements of the public, and has planned a concert-room of which any city in the world would be proud. It is not my province either to criticise or comment upon the architecture. The concert-hall was designed to accommodate some

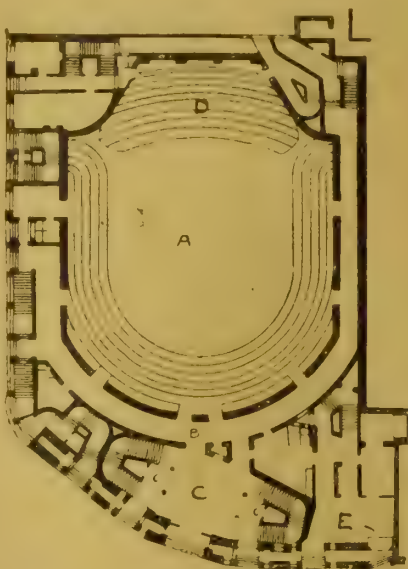


FIG. 1.—A, auditory; B, corridor; C, vestibule; D, orchestra; E, minor hall vestibule.

three thousand persons, the chief division of which (stalls) was placed below the street level on account of questions of light and air. The first balcony is on the street level, approached from a large vestibule. The second balcony is above the street, and, like the first, entirely surrounded by a wide corridor. The exits are very numerous, as the admirable position and site allow of free access into the street by a number of extra staircases up from the area level and down from the gallery, in addition to the grand staircase and vestibule. Special provision is made for the 500 occupants of the orchestra, from which there is an exit on either side below the organ gallery. The minor hall has its separate approaches and exits.

It is claimed that the lines of the internal design were reversed from those usually adopted, and a parallelogram with a curved end substituted for the horseshoe form. The orchestra sides are convex, the idea, it is said, being borrowed from the shape of certain wind instruments. The walls of the convex are lined with wood on battens, with coarse canvas strained over the wooden lining to check vibrations. There are no columns in the hall to obstruct sound-waves or divert them from their true course. What the Queen's Hall is, is so well known that it is not needful to speak further of it.

There is a small concert-hall at St. Leonard's-on-Sea (Fig. 2) which is particularly good, in my opinion, as a provincial hall of entertainment. It is arranged with a stage at one end, and an orchestra at the other. When concerts are given, the audience are seated facing the orchestra, and seats are placed on the stage, which then becomes a kind of gallery of raised seats above the floor level. When stage plays are performed, the

chairs are turned round facing the stage, and the public occupy the raised orchestra, from whence a capital view of the stage is obtained. I have frequently wondered why this form of plan has not been more often copied or adapted for small

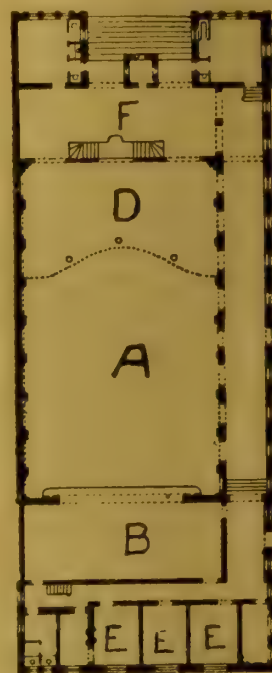


FIG. 2.—A, concert-hall; B, stage; C, corridor; D, orchestra; E, dressing-rooms; F, vestibule.

provincial concert-halls, as it has so many advantages. The constant changing of the "fit-up" of the hall required when the class of entertainment varies from night to night is avoided, and expenses thus saved. Everybody is able by this arrangement to see and hear the performance,

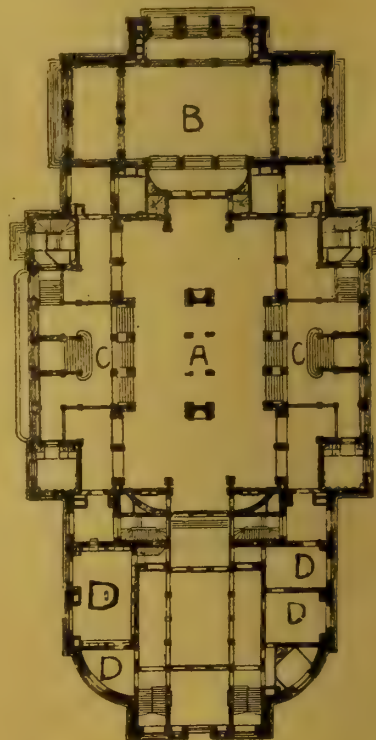


FIG. 3.—A, grand entrance hall and crush-room; B, saloon; C, grand staircases; D, administrative offices.

and the provisions are such as to be suitable to the requirements of all kinds of entertainments.

There are many noted concert-halls abroad, one of the most famous of which is to be found at Leipzig, erected in 1882-1884 from the designs of the architects Gropius and Schmieder, who, in a competition of 25 competitors, were the winners



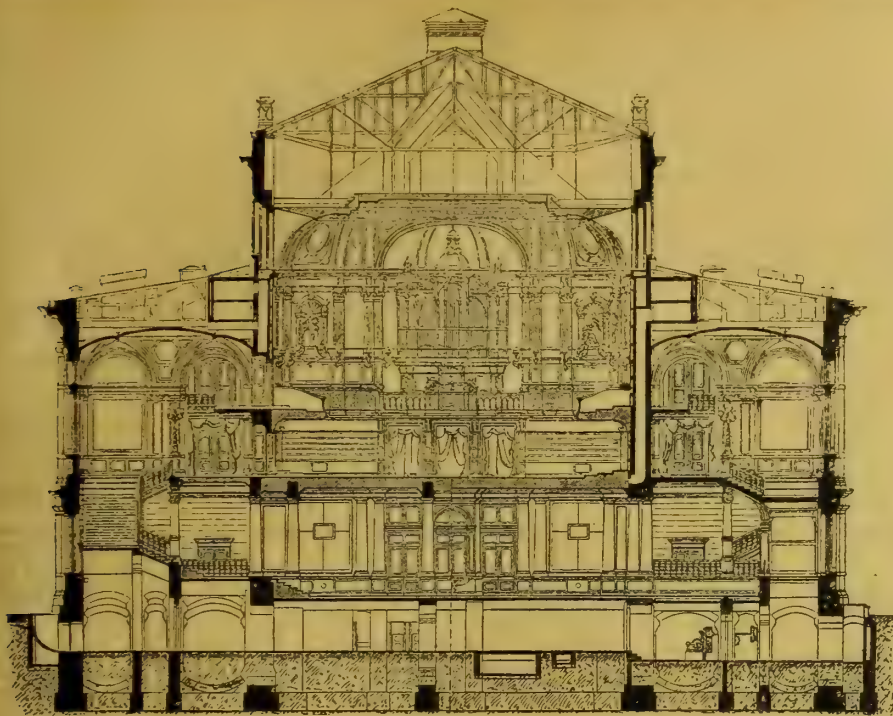


Fig. 5.

of the prize. The conditions published in 1880 stipulated that there should be 1,700 seats in the large concert-hall, and room in the orchestra for 500 performers, musicians, and singers. I give two plans (Figs. 3 and 4) and a section (Fig. 5) of this building. The small concert-room contains 793 seats, of which 487 are on the area level, and 306 in the gallery.

The dimensions of the large concert-hall are 42.5 mètres long by 19 mètres wide, and 14.6 mètres high. There are 1,178 seats on the area

from windows at the sides and at the top. The seating accommodation in the orchestra is for 500, as required by the terms of the competition.

The building is isolated, and has entrances on all sides. The main entrances, which are screened by external lobbies, lead to a vast crush-room extending under the entire space occupied by the concert-hall above on the first floor. In this crush-room are several "hats and coats" counters, and there are exits therefrom and in every direction. Wide staircases, right and left, lead to the area floor of the concert-hall above, while separate staircases ascend to the two tiers of boxes, and other distinct staircases approach to the smaller hall and orchestra. There are reading-room, library, bureau, and housekeeper's rooms on the ground floor.

On the first floor is a large foyer at one end of the great hall, and a small concert-room at the other; retiring-rooms for soloists and musicians' rooms complete the arrangements. The building is heated and ventilated in such a manner that the temperature of the large hall, small hall, and foyer can each be raised or lowered separately to any given degree. The fresh air is forced in, after being warmed, at the rate of 20 cubic mètres per head per hour. An 8 H.P. gas-engine is employed to do this. The foul air is extracted by means of large ducts, and is discharged in huge chimneys in the upper part of the roof.

A diagram is given (Fig. 6) of the old Concert Hall at Leipzig. This was a large wooden box, within a building, erected upon the ceiling of the warehouse below, beneath which again were store-rooms. The main floors were carried by ash-posts, and the construction of the hall was entirely of varnished wood partitions with wooden linings rounded off so as to leave no angles at floor and ceiling. Herr Müller, in describing this hall, speaks of an empty space beneath the concert-room floor, from which it may be assumed that the cloth warehouse was not used, and that a reverberative space was thus left beneath the hall.

In many of the orchestras of theatres recently erected on the Continent, the wooden floor is laid over an empty space formed by an inverted tunnel—for example, this is the case in the Amsterdam New Municipal Theatre; obviously the object of this hollow space is to increase resonance in the same way as was done by accident at the old Gewandhaus.

Herr Müller likens this concert-hall to a violin—the inner roof or ceiling, and partitions, represented, according to him, the strings and bridge; the ceiling of the cloth floor, with its transverse beams, formed the belly; the upright story-posts the sound-posts and bass-bar, and the lower floor the back of the violin. All the parts of the room, therefore, were free to vibrate, no rigid floors or walls being in connection with the actual concert-

room anywhere; it is no doubt true that the sides, roof and floor, of such a room would reinforce the sound of voices or musical instruments in somewhat the same way that the body of a violin reinforces the sound of the strings.

The satisfactory effect of the room acoustically was notorious, and rests on abundant testimony;

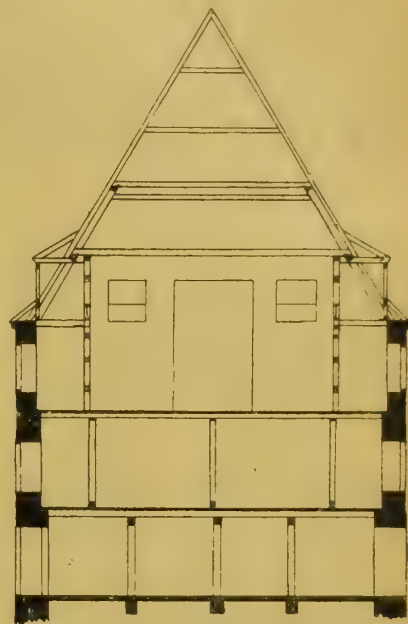


Fig. 6.

its construction and position are probably mainly accountable for this.

However perfect such a structure may be acoustically, its form of construction could not be accepted as satisfactory from the point of view of safety, for the inflammability of such a building would be highly dangerous to the lives of any assembly of people.

#### SLAG-CEMENT MANUFACTURE IN GERMANY.

THE Department of State in Washington, having recently instructed the American Consuls in different towns in Germany to report on the manufacture, cost, and uses of slag cement in that country, has now published reports from Magdeburg, Dusseldorf, Frankfurt, and Stettin dealing with the subject. This cement, it seems, is made by mixing pulverised hydrate of lime with basic blast-furnace scoria, which has been granulated, dried, and reduced to powder by grinding. It is used for certain purposes as a substitute for Portland cement, for it is about 20 per cent. cheaper, and, being of lower specific gravity, "spreads farther," so that, on the whole, the economy in using it is 30 to 40 per cent. It is also alleged that the mortar is more tenacious and elastic, and thus is more suitable for the foundations of bridges and other structures liable to unequal strain or to the shock of passing trams or vehicles. It was originally suggested by the excellent cement obtained from mixtures of hydraulic lime and *puzzolani*, or pulverised lava, which was first produced in Germany in 1863. Blast-furnace owners soon recognised a profitable outlet for the worthless slag they had for years been piling up on land bought for the purpose. But it was found that the slag required careful handling for mixture with the lime, and different methods of granulating and preparing it were patented, and for many years there were repeated failures to produce proper cement from slag. The essential element in basic slag for making cement is silicic acid in proper proportions, and then this must be "live" and in a condition to unite readily and firmly with the lime, while the slag must contain a due proportion of magnesia, and not an excess of some impurity which will resist the combination, and, sooner or later, cause crumbling or disintegration. In Western Germany there is only one small district—in the Saar Valley—where slag of perfect quality is produced, and here the slag-cement manufacture is concentrated in the hands of two firms. This cement seems to be regarded with some suspicion by engineers, who will only use it when they

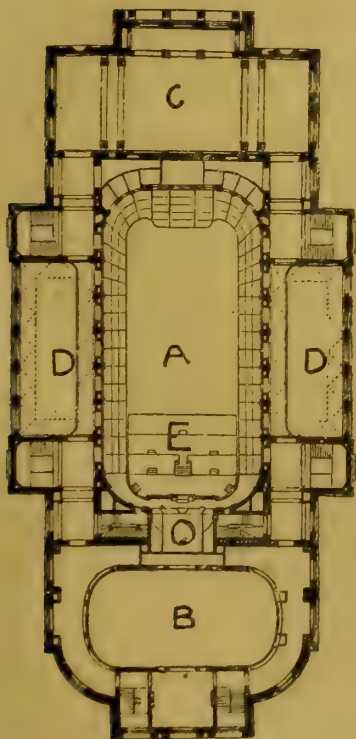


Fig. 4.—A, concert-hall; B, minor hall; C, foyer; D, space over entrances; E, orchestra; O, organ.

floor; 449 persons are accommodated in 37 boxes on the first tier, and 118 on the second tier, making a total of 1,744 seats, each measuring 75 centimètres deep by 75 centimètres wide. As the hall is used for various purposes besides concerts, the seats are not fixed, but can be moved and stored away in a space built specially for the purpose. So that the hall may be used for functions during the daytime, abundant daylight is obtained



know where, by whom, and from what materials it has been manufactured. When of good quality it may be used with advantage where the work will always be moist and protected from the sun. It is also used for paving tiles for courtyards, &c., and for this purpose is mixed with fine Rhine gravel and quartz sand and subjected to pressure. The manufacture offers no serious mechanical difficulties, but requires sound technical knowledge and good workmanship. The Consul at Magdeburg says that the industry is dying out in Germany, owing to the opposition of Portland cement, lack of support from the Government, and stagnation in the building trade; while the Consul at Stettin mentions that a factory opened there some years ago failed, and he cannot find where one exists now. In Germany it is usually called puzzolan cement.

#### CHIPS.

The corner-stone of the Darlington Technical College, which is to be erected at a cost of over £13,000, was laid, on Saturday, by Mr. Arthur Pease, Member for the borough.

The vicar of Acton, near Nantwich, has received from Mr. Sutton Timmis, who was born in the parish, and whose mother lies in the old churchyard, intimation that he will bear the cost of restoring the nave of the church. The estimated cost of the work is £2,000.

The new Midland Company's passenger station at Gloucester was opened for passenger traffic on Sunday. It is built on the main line, thus obviating the backing in of trains, formerly necessary, and is connected with the adjacent Great Western Company's station by a bridge 570ft. in length.

When the great parish church of Doncaster was rebuilt, after the disastrous fire in 1853-62, from plans by the late Sir Gilbert Scott, assisted (or otherwise) by Lord Grimthorpe, an organ was built by the late Herr Edmund Schultze, of Paulinelle, near Erfurt. The instrument has now been reconstructed, and provided with mechanical blowing apparatus. Messrs. Abbott and Smith, of Leeds, have carried out the work.

At the opening of the Cheshire Quarter Sessions, on Thursday in last week, a portrait of Sir Horatio Lloyd, chairman of the sessions, painted by Mr. W. W. Oulless, R.A., was formally unveiled and presented for the permanent decoration of the court by the subscribers. The portrait, a half-length, represents the county-court judge in his robes and as seated, and was hung at the Academy last year.

At a meeting on Friday of the Penrhyn-side Parish Council, held at Llandudno, the tender of Messrs. Sheffield for £2,950 was accepted for the drainage scheme, which is to be carried out from the plans of Mr. T. B. Farrington, C.E., borough surveyor of Conway, Mr. Richard Jones being appointed clerk of the works.

The work of repair to the roof of Winchester Cathedral is to be put in hand at once, and will be undertaken by Mr. John Thompson, of Peterborough. It is stated that his estimate is £6,520, and he is to complete the work in a year. Mr. J. B. Colson, of Winchester, the architect to the Dean and Chapter, will superintend the work.

The city council of Coventry received at their last meeting reports by Mr. Hammond, their consulting electrical engineer, and a committee, on the needed extension of the electric lighting. The capital expenditure up to date amounts to £23,485, or £3,485 more than the amount sanctioned by the Local Government Board. The committee recommended that sanction be obtained for a further loan of £13,000 to cover this excess, and to meet the necessary addition to the generating capacity of the works by the enlargement of the boiler-house, two new Lancashire boilers, and new plant. The recommendation was adopted.

On Wednesday week the parish church of Shepton Moutague, which has been closed for some time undergoing restoration, was reopened by Dr. Kennion, Bishop of Bath and Wells. About £1,000 has been spent on the fabric, £400 of which has been given by the Earl of Ilchester, patron of the living, for restoring the chancel.

Operations have been commenced for an extensive addition to the graving dock of the Grangemouth Dockyard Company. The dock will be enlarged to 265ft. in length, and will then be capable of accommodating the largest class of vessels frequenting the port. Piling machines have been at work, and steam-cranes are being erected for excavating in the river. The entrance to the dock will be effected by a large floating iron gate. The work, it is expected, will not be completed until July.

On Thursday in last week, Lady Belper laid the foundation-stone of the proposed new vicarage for St. Alkmund's parish, Derby, at the corner of Belper-road. The site has cost £1,000, and the house will involve a total outlay of £3,000.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the last meeting of this body, the president, Dr. R. Rowand Anderson, in the chair, a paper entitled "Notes on a Tour to Rome" was read by Mr. James Clark, president of the Master Painters' Association. The lecturer briefly sketched the chief architectural features of places on the route. He described at length the various artistic sights of Rome, and special attention was given to architectural details, to pictures and statues, and especially to mural decorations, of which the lecturer made a special study. A series of lime-light photographic views added to the interest of the lecture.—The members of the association left the Waverley Station by train on Saturday afternoon for Dunfermline, on a visit to the Abbey and Palace, and also Pitreavie House, some miles distant. The nave of the abbey is the largest and most perfect example of the Norman style in Scotland. The original Church of Holy Trinity was founded by Malcolm Canmore and Queen Margaret in 1070. Pitreavie House is an interesting old Scottish mansion, which had additions made to it a few years ago. Mr. David MacGibbon, F.S.A.Scot., acted as leader of the party.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE SCIENTIFIC SOCIETY. The closing lecture of this society for the session was delivered on Saturday evening by Mr. James Lockhead, A.R.I.B.A., assistant lecturer on Architecture in the College, the subject, "Our Modern Architecture," being treated by a division into two heads, historical and practical. After describing generally the development of architecture from the introduction of the Renaissance into England till the present day, in which the effect of literature was pointed out, the essayist led up to a consideration of the difficulties the latter-day architect had to contend with in reconciling modern research, progress and invention in building materials, &c., with modern architecture, and advocated a closer sympathy between architect, client, and artisan or specialist.

PRESTON MASTER BUILDERS' ASSOCIATION.—The twelfth half-yearly meeting of this Association was held at the Castle Hotel, on Wednesday week, when the President, Mr. John Walsley, occupied the chair. The minutes of the last meeting having been confirmed, the secretary, Mr. John Tomlinson, read the report, which stated that the number of members on the books was 65. Notices for alterations in working rules had been received from the carpenters and joiners and bricklayers during the year. In the former case it was desired to prohibit the fixing of framed joinery prepared above five miles from the Town-hall unless made by the contractor; but the employers declined to adopt such a rule, while no arrangement had been arrived at with the bricklayers either as regards the minor alterations desired by them or the proposal of the employers to modify the absurd and vexatious restrictions on country work. Representatives had attended the meeting of the National Association at London, and of the Lancashire Federation at Blackburn, and would report to the meeting. It had been decided to obtain counsel's opinion as to the legality of the manner in which the water committee of the corporation are acting, and to endeavour to put a stop to the unfair competition to which private employers and qualified plumbers are subjected. The committee are unable to see why the corporation should be allowed to trade in competition with ratepayers at all; but when such competition is carried on by unskilled labourers at little more than half the wages the members have to pay to skilled artisans for the same class of work, the injustice is more than glaring. A petition has been presented to the corporation, asking them to let all their building works by public competition, and not to allow large sums of public money to be expended by their officials to the detriment of the interests of the ratepayers. On the motion of Mr. J. Christian, seconded by Mr. J. Cartmell, the report was adopted. The revised rules drafted by a committee were adopted, and a sub-committee appointed to deal with disputes or matters of urgency. Messrs. J. G. Christian and T. H. Kellett were elected to represent the association on the executive committee of the Lancashire Federation, and Messrs. Cartmell, Tullis, Nickson, and Cooke to attend the annual general meeting. The members passed a vote of condolence with the widow and family of the late Mr. T. Strickland.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ninth annual report of the council, presented at the annual meeting held on Tuesday evening, Mr. Charles Hadfield, the President, in the chair, congratulated the members on their continued success, the society having still further increased in the number of its members, while the balance in hand is higher than at any previous period. There are at present 35 Fellows, 35 Associates, 14 Students, 5 Honorary Members, and 14 Lay Members, a total of 103; against 85 at the end of the previous year. Lectures have been given during the session by Mr. Paul Waterhouse, M.A., F.R.I.B.A., on "The Brotherhood of Architects"; Dr. Sorby, F.R.S. (hon. member), "Norman Architecture"; Mr. Percy Fitzgerald, M.A., F.S.A., "The Adam Architecture"; Mr. Thomas Winder, Assoc.M.Inst.C.E. (Fellow), "Local Half-Timbered Buildings"; Mr. Hugh Stannus, F.R.I.B.A., "Axiality." The attendances have been larger than in former years. For the first time the society has had an excursion. This took place on Saturday, June 15th, when a large party visited Hardwick Hall, where descriptions of the buildings, furniture, pictures, and muniments were given by Mr. B. Bagshawe, who for many years has carefully studied the hall and its contents. A visit to the new Sheffield Royal Hospital has been made, on the invitation of the architect, Mr. Hadfield, who explained the arrangements and provisions of the various departments. The first portion of the hospital has been opened by H.R.H. the Duchess of York. The council also forwarded the following resolution in response to an application from the Institute of British Architects to assist a movement respecting some proposed changes:—"That the council of the Sheffield Society of Architects and surveyors would be willing to consider any tangible scheme for rendering the R.I.B.A. more useful to the profession, more influential generally, and more representative of the interests of country architects." The R.I.B.A. having appointed a special committee to consider the present condition of architectural competitions, it was resolved:—"That this council recommends that it should be the duty of an assessor in a competition to put aside such designs as do not fulfil the stated requirements on material points; and that to give prominence to such designs in a way that makes an excuse for their adoption by the promoters of the competition is an injustice to those other competitors who have complied with the instructions, and a violation of the protection which architects ought to obtain by the employment of a professional assessor; and that all requirements which are not distinctly stated to be optional should be treated as imperative." Correspondence has taken place respecting competitions for a school at Whitwell, and for a fire-brigade station in Sheffield. A deputation from the Sheffield Master Painters' Association has waited upon the council to urge the desirability of separate contracts for the various trades, especially in regard to painting, instead of building works being let in whole contracts, as is now general in Sheffield. A movement has been commenced by three members of the society (Messrs. C. M. E. Hadfield, J. B. Mitchell-Withers, and J. R. Wigfull) for the publication of "The Sheffield and District Architectural Sketch Book." An excursion is intended to be made during the summer, probably to Wentworth; and arrangement for the session 1896-7 are in a forward state, several lectures having already been promised. The sketching class, conducted by Mr. J. R. Wigfull, A.R.I.B.A., made six visits during the summer, taking Workshop Priory Church, Dronfield Church, Bolsover Castle, Derwent Hall, and Darnall Hall. On the award of Mr. Austin, of Lancaster, the first prize was awarded to Mr. L. D. Hemsoll, and second prize (augmented to £2 2s., in consideration of the excellent work) to Mr. F. Wilson. The architectural history class is under the guidance of Mr. J. R. Wigfull, A.R.I.B.A.; and the designing class been conducted, as in previous years, by Mr. E. M. Gibbs, F.R.I.B.A. The statement of accounts was read by the treasurer, Mr. F. Fowler, showing a balance in hand of £70 6s. 2d., as against £64 0s. 6d. at the commencement of the year. The reports were adopted, and the following elections were made for the ensuing year—viz.:—President, Mr. C. Hadfield; vice-president, Mr. R. W. Fowler; treasurer, Mr. F. Fowler; hon. sec., Mr. C. J. Innocent; council, Messrs. H. W. Lockwood, J. Smith, T. Winder, W. F. Hemsoll, and W. C. Fenton.



## CONTENTS.

Getting One's Own Way .....	551
Two Aspects .....	552
The Conditions of Building Contracts .....	553
Factory Construction and Factory Acts.—I.....	553
County Lunatic Asylums.—XLIII.....	555
Notes on Domestic Drainage.—XI.....	556
The Timbers of Australasia.—V.....	557
BUILDING NEWS DESIGNING CLUB .....	559
Alterations to Old Buildings in London .....	559
Concert-Halls and Assembly-Rooms.—XV.....	560
Slag-Cement Manufacture in Germany .....	561
Architectural and Archaeological Societies .....	562
THE BUILDING NEWS DIRECTORY .....	563
Our Illustrations .....	563
Building Intelligence .....	582
Obituary .....	583
Engineering Notes .....	583
Competitions .....	584
Correspondence .....	584
Intercommunication .....	584
Legal .....	585
Legal Intelligence .....	585
Water Supply and Sanitary Matters .....	585
Our Office Table .....	586
Meetings for the Ensuing Week .....	587
Trade News .....	587
Tenders .....	588

## ILLUSTRATIONS.

THE PASSMORE EDWARDS NUNHEAD PUBLIC LIBRARY.—  
NEW PREMISES, DUKE STREET, GROSVENOR SQUARE.—  
THE HALL OF THE GROCERS' COMPANY.—OLD HOUSES AT  
SHREWSBURY.—"BUILDING NEWS" CLUB DESIGNS FOR A  
PUBLIC-HOUSE.—BIRMINGHAM A.A. SKETCHES.—PREMISES  
AT SWANSEA.

## Our Illustrations.

THE PASSMORE EDWARDS PUBLIC LIBRARY,  
NUNHEAD GREEN.

THE Nunhead district of the parish of Camberwell, which has hitherto stood greatly in need of a free public library to meet the requirements of its large and mainly working-class population, was brought within measurable distance of the realisation of its desires by the laying of the foundation stone of the new building in Gordon-road on Saturday last. Camberwell has already five such buildings in various localities; but these have been for a long time totally inadequate for the needs of a population numbering 280,000. The building is situated in the Gordon-road, Peckham, and at the south end of it near to the Green. It will, when completed, occupy a frontage towards the road of above 95ft., and is set back from it as far as practicable so as to allow a passageway all round it, so that access may be obtained to any part of it. The plan is as follows:—The public rooms are all on the ground floor, and in each case have top light and ventilation in addition to that at the sides. The news-room is at the south end, 38ft. by 25ft. wide nearly; the library, about 30ft. square, arranged to contain about 10,000 volumes. A small magazine-room, 24ft. by 15ft., and a store-room for librarian's use and for work, together with the usual offices. The building is entered by an archway into an ample porch and vestibule; beneath this is a basement for the heating apparatus and fuel, and above the porch the usual caretaker's apartments are provided. Externally the building will present a design of simple character, built generally in stock bricks and relined with "reds" for dressings, and slate roof. The estimated cost is about £2,500. The architect is Mr. Robt. P. Whellock, A.R.I.B.A., 45, Finsbury-pavement. The contractors are Messrs. F. Gough and Co., Church-end, Hendon.

NEW PREMISES, DUKE STREET, GROSVENOR SQUARE.

THIS block of buildings consists of business premises, shops, and flats. The part nearest Grosvenor-square, of which the view is given, was erected for Mrs. Kerr. It consists of shop and offices upon the ground floor, fitting and workrooms upon the first floor, and lady assistants' quarters in the upper part. The remainder of the building was erected by Messrs. Trollope for themselves, and has a further frontage to Robert-street. The exterior is built in narrow bricks, with a wide joint. Messrs. Geo. Trollope and Son were the builders of the whole. The view, which was made from the building itself, is the work of Mr. T. A. Slater. The architect is Mr. W. D. Caroe, M.A.

THE CITY GUILDS, NO. XVIII.: THE GREAT HALL OF THE GROCERS' COMPANY.

WE have already given an account of this Company's new buildings, of which Mr. H. C. Boyes was the architect. Our previous illustrations appeared, with plans, in the BUILDING NEWS for Jan. 25th, March 22nd, and August 2nd last year, giving views of the grand staircase and drawing-rooms, which are most handsomely furnished with marble chimneypieces the full height of the apartments. The great hall is entirely lined with wainscot oak panelling, and a gallery extends round the four sides. Behind the high table is a buffet for the display of plate. The furniture was made from the architect's designs by Messrs. Gillow, and by Messrs. Hollands, of Mount-street.

OLD HOUSES, SHREWSBURY: ROYAL ACADEMY TRAVELLING STUDENTSHIP DRAWINGS.

THIS sympathetic study, by Mr. James S. Stewart, is chosen from a series made by him as Travelling Student of the Royal Academy of Arts. It shows some picturesque old houses still standing in the Frankwell, Shrewsbury, and as a typical example of Salopian woodwork of its kind is hardly to be surpassed. There are larger and more elaborate specimens, of course, which could be named in the same town, such as "Ireland's Mansion," or "Hill's Mansion," "The Gateway House," or even the shop gable in Pride Hill; but none exceed these little old projecting Frankwell bays for grace and simplicity. They have suffered somewhat, however, from continued "doings-up." Other sketches from Shrewsbury will be found in the BUILDING NEWS for March 7, May 20, and October 17, 1890, and for Feb. 12, 1892.

"BUILDING NEWS" DESIGNING CLUB: A VILLAGE PUBLIC HOUSE.

(See description on page 559.)

BIRMINGHAM A.A. SKETCHES, BY HERBERT NORMAN.

THESE drawings will perhaps prove of interest to our readers as showing the type of work done by the Sketching Class of the Birmingham Architectural Association, which meets once a month during the winter under the supervision of Mr. E. C. Bewlay. A photograph is given to each member, from which, within the space of one hour, a drawing has to be made. Prizes are awarded at the end of the session for the best series of studies thus produced. The class has, we understand, been well attended, and encouragement is given by this indoor work for sketching from nature. The sketch of St. Mary's Hall, Coventry, given herewith, was made on the spot during one of the summer outings of this class. The others were made as above described. We shall give a lithograph of some more of the same author's sketches at an early date. St. Mary's Hall, Coventry, is a capital specimen of Domestic architecture, and stands in close proximity to the well-known church of St. Michael, the tower and spire of which ranks of course among the finest in England. The sketch herewith reproduced was taken from a small garden at the back, only to be entered by passing through the kitchen, which in itself is a most uncommon study. The Market House at Chipping Campden, in Gloucestershire, forms one of those interesting buildings occasionally found in small villages. On a bright day this quaint old structure, with its time-stained tiles, forms a most charming bit of colour. The church seen in the distance is also of considerable interest, one feature being very curious—the label of the tower doorway being carried up the entire height of the tower. The Old House at Evesham is a typical "bit" to be met with in this village, which affords an excellent sketching ground for the artist, especially should he be of a boating turn of mind. The Avon, close at hand, furnishes more delightful "bits" for the colourist, and there are villages enough in the immediate vicinity of the stream to satisfy the most exacting searcher after the picturesque.

SHOP AND OFFICE PREMISES IN WATERLOO STREET, SWANSEA.

THIS building was erected for Mr. Samuel Hughes, ironmonger, of Swansea, by Mr. John Evans, contractor, Brynhyfryd, Swansea, at a cost of £1,860. The whole of the front is carried out in buff terracotta, supplied by Messrs. J. C. Edwards and Co., of Ruabon. The windows are glazed with plate glass in wrought-iron casements, and the roof covered with green slates. The upper part of the building is set back to a corporation improvement line, and the lower part

of the front is so arranged that it can be set back to the same line when the general widening of the street is carried out. The architects are Messrs. Hannaford and Wills, of Swansea.

## CHIPS.

The members of the Hampshire Field Club had an outing on Wednesday week in the neighbourhood of Netley. The parish church of Hound was visited, under the guidance of Mr. T. W. Shore, and at Netley Abbey papers were read by the Rev. G. W. Minns and Mr. Edmund Buckle, architect to the Dean and Chapter of Wells.

Whilst examining the parish church of Austerfield, near Bawtrey, on the borders of Yorkshire and Lincolnshire, with a view to restoration, the architect, Mr. C. Hodgson Fowler, of Durham, has discovered that the whole of the north side consists of a row of Norman arches perfectly preserved, which have been built up into the wall. The church is very small, the chancel being only about 12ft., and the rest of the church about 18ft. wide. It has a Norman western doorway, and an arch of the same period divides the chancel from the body of the church. There is also an ancient font, recently rescued from being a drinking-trough for cattle, and a carved altar-table.

The Queen has contributed £150 to a fund being raised by Dean Farrar to signalise, by some permanent benefit to Canterbury Cathedral, the thirteen-hundredth anniversary, which occurs next year, of the baptism of King Ethelbert. Other donations have been received from well-known Churchmen. It is proposed under the scheme to expend about £20,000 on the restoration of the cloisters, chapter-house, crypt, &c.

Foundation-stones of a new Primitive Methodist chapel at Wentworth-street, Birdwell, near Barnsley, was laid last week. The building will accommodate 250 people, and is built by Mr. F. Ballard, of Birdwell.

The Glasgow Corporation have set an example which might well be followed by other bodies who assist in maintaining schools of art and yet never think of utilising them. In their school of design they have offered a premium for a wrought-iron bracket for continuing the existing gas-lamps, and rendering them suitable for a pendent globe.

The Science Standing Committee of the Royal Institute of British Architects, acting on a suggestion made when the question of sound in its relation to buildings was under discussion last session, are instituting a series of inquiries with a view to collect further information on the subject. The lines on which the inquiries are based are indicated in a schedule of questions which may be obtained at 9, Conduit-street, W.

The death has taken place, at Abercanaid House, Merthyr Tydvil, of Mr. W. P. Lewis, the third brother of Sir J. T. W. Lewis, and an engineer of equal distinction. The deceased was born in 1842, and when only twenty-two years of age became mineral agent to Lord Dynevor's estates, enjoying also a large private practice. His ability as an expert witness in mining cases was unequalled.

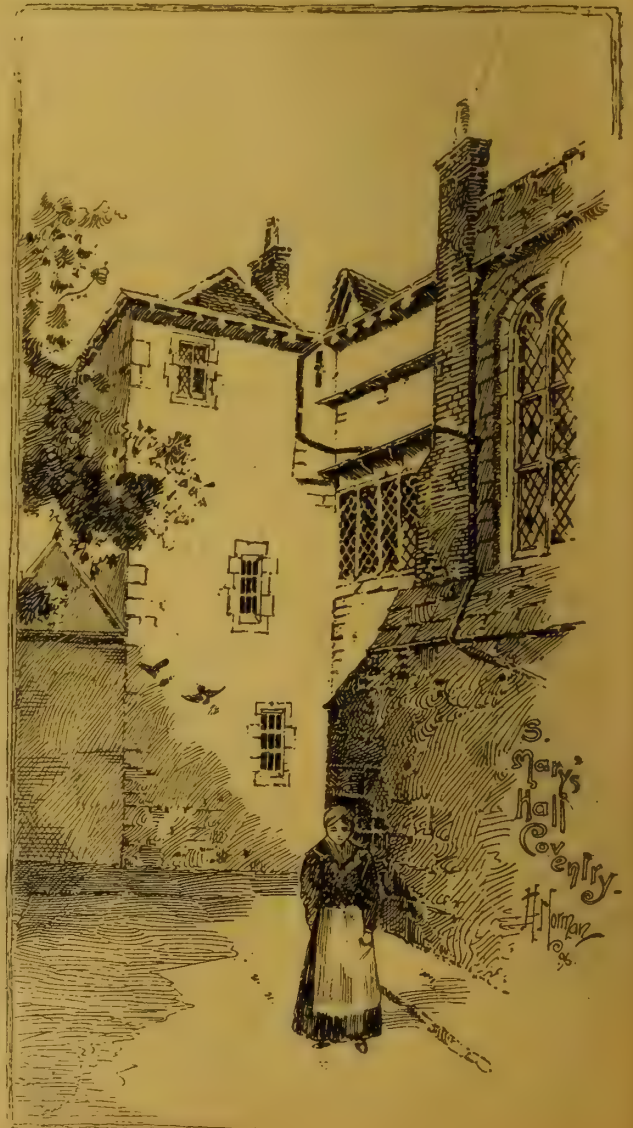
Alderman J. Brewer, the "father" of the Walsall Town Council, and one of the leading timber merchants in that town, died on Monday. He served as mayor of the borough 1865-6-7.

On Saturday an inquiry was held by Mr. Crozier, Local Government Board inspector, at the council chamber, Darlington, into a proposal to borrow £50,000 for the extension of Darlington Gasworks. The borough surveyor (Mr. Smith) gave evidence, from which it appeared that the increase in the consumption of gas had been 11½ per cent. from 1894. The provision for further supply was urgent. The purchase of 3½ acres of land was included in the proposal. Mr. Hawksley, civil engineer, gave evidence and details of the proposed enlargement. If the increase continued at the present rate for ten years, there would be from £50,000 to £60,000 needed to meet the requirements.

Owing to the demolition of property for railway extensions and the clearance of slums, the rents of workmen's houses in Edinburgh have advanced, and an indignation meeting has been held in reference to the matter, at which a deputation was appointed to wait upon the corporation and state the grievances of tenants.

Memorial stones of the W. J. McQuiston Memorial Church have just been laid at the corner of Castle-reagh-road and Leitrim-street, Belfast. The building will consist of a nave and aisles, with galleries above the latter, and at the angle of site will be a tower 80ft. in height, capped by a spire rising another 60ft. The style adopted is Early Gothic, the materials are red bricks and white sandstone dressings, and accommodation will be provided for 1,200 persons. Messrs. Young and Mackenzie, of Belfast, are the architects, and Mr. Robert Corry, of the same city, is the sole contractor.







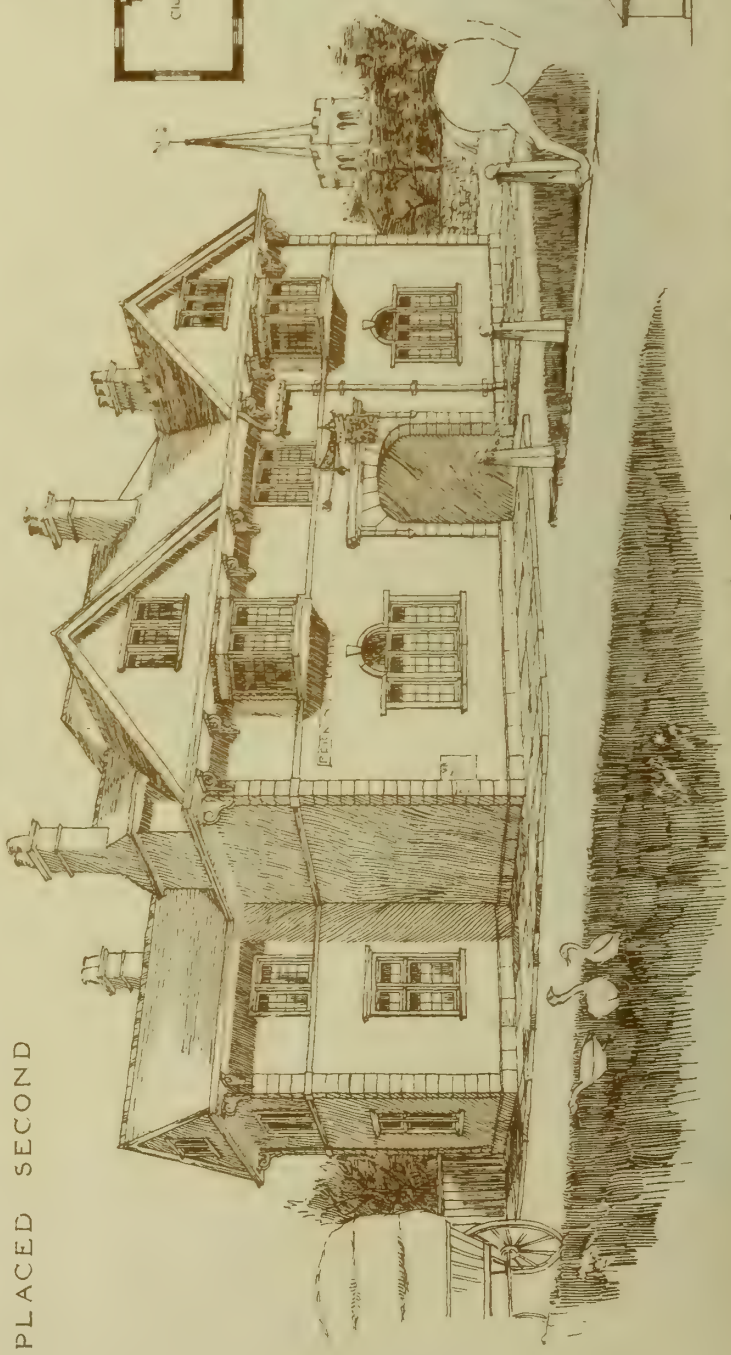






FRONT ELEVATION

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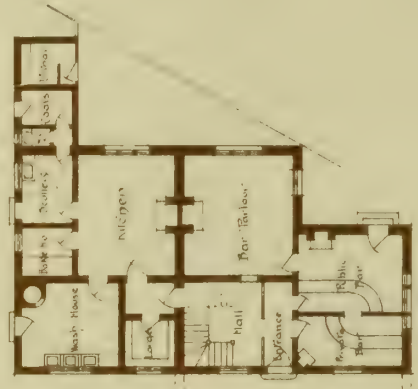


THE B.N.D.C.  
A VILLAGE PUBLIC  
HOUSE BY TAPFOL  
MARCH 1896

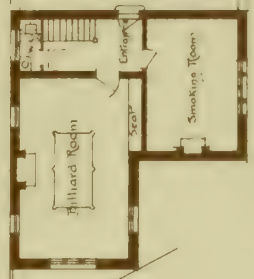


PLAN OF STABLES

YARD



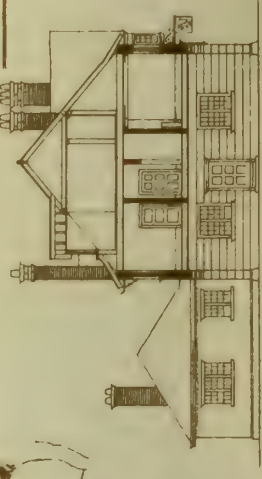
GROUND FLOOR



FIRST FLOOR



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SECTION THRO' GATEWAY



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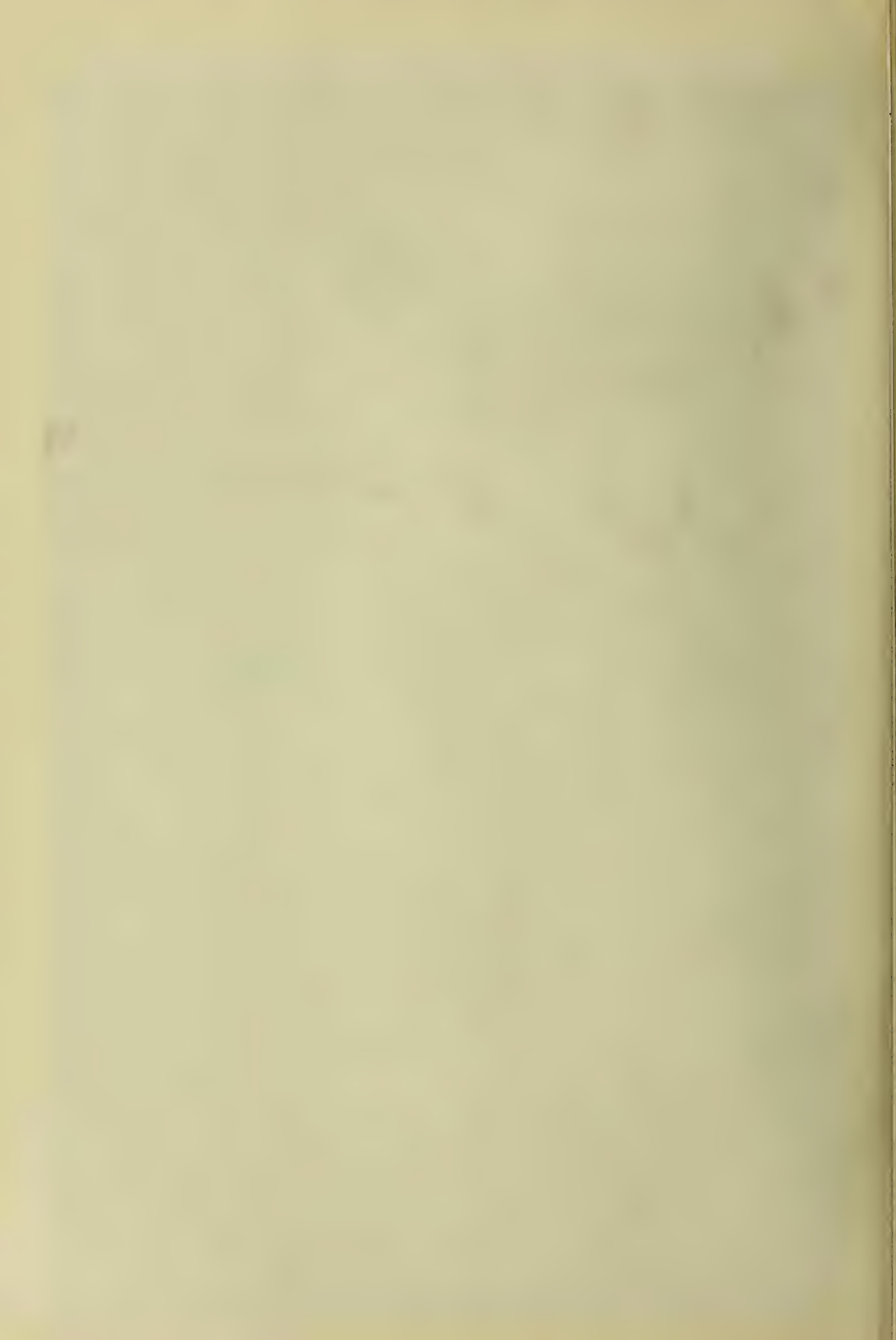
THE GREAT HALL.



MS. APRIL 17, 1896.





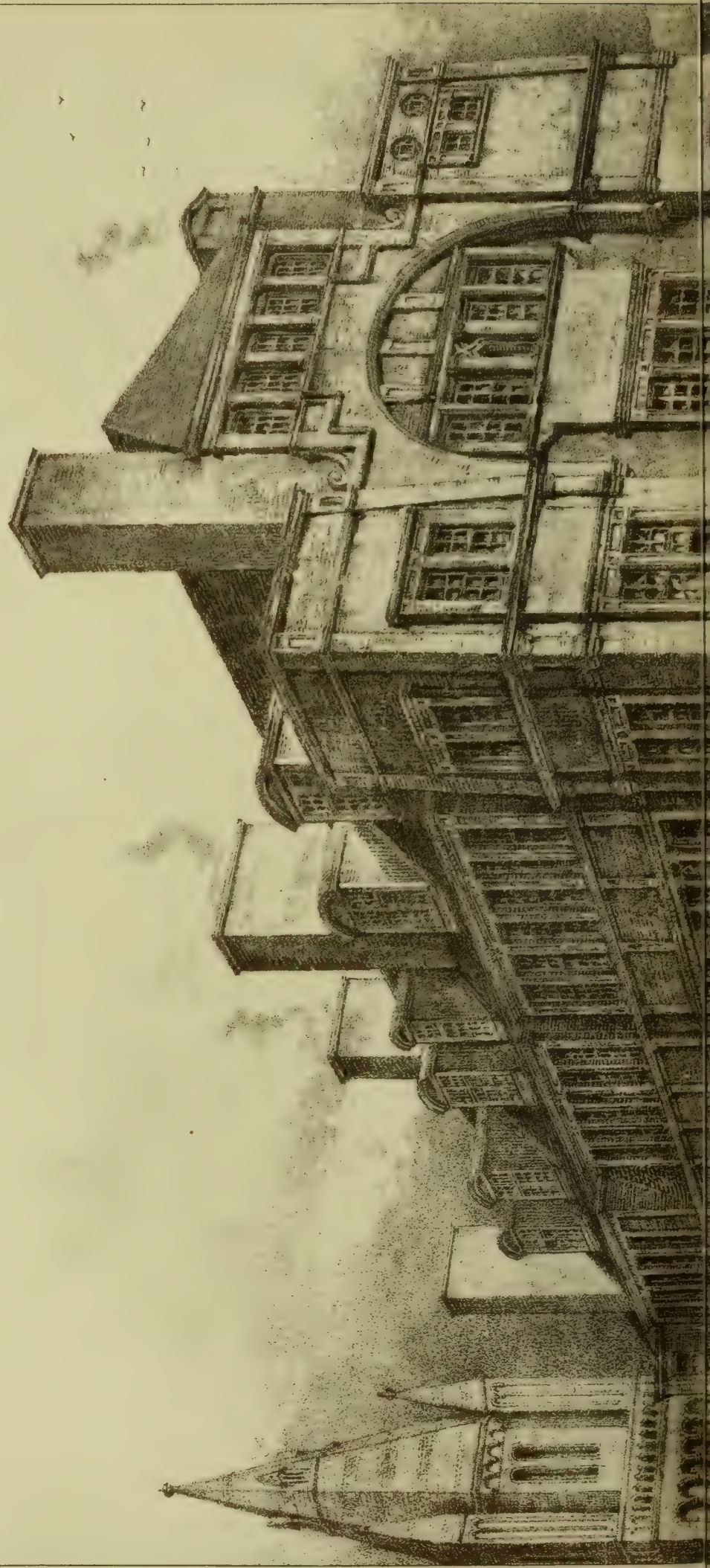








THE BUILDING NEWS, APRIL 17, 1896.





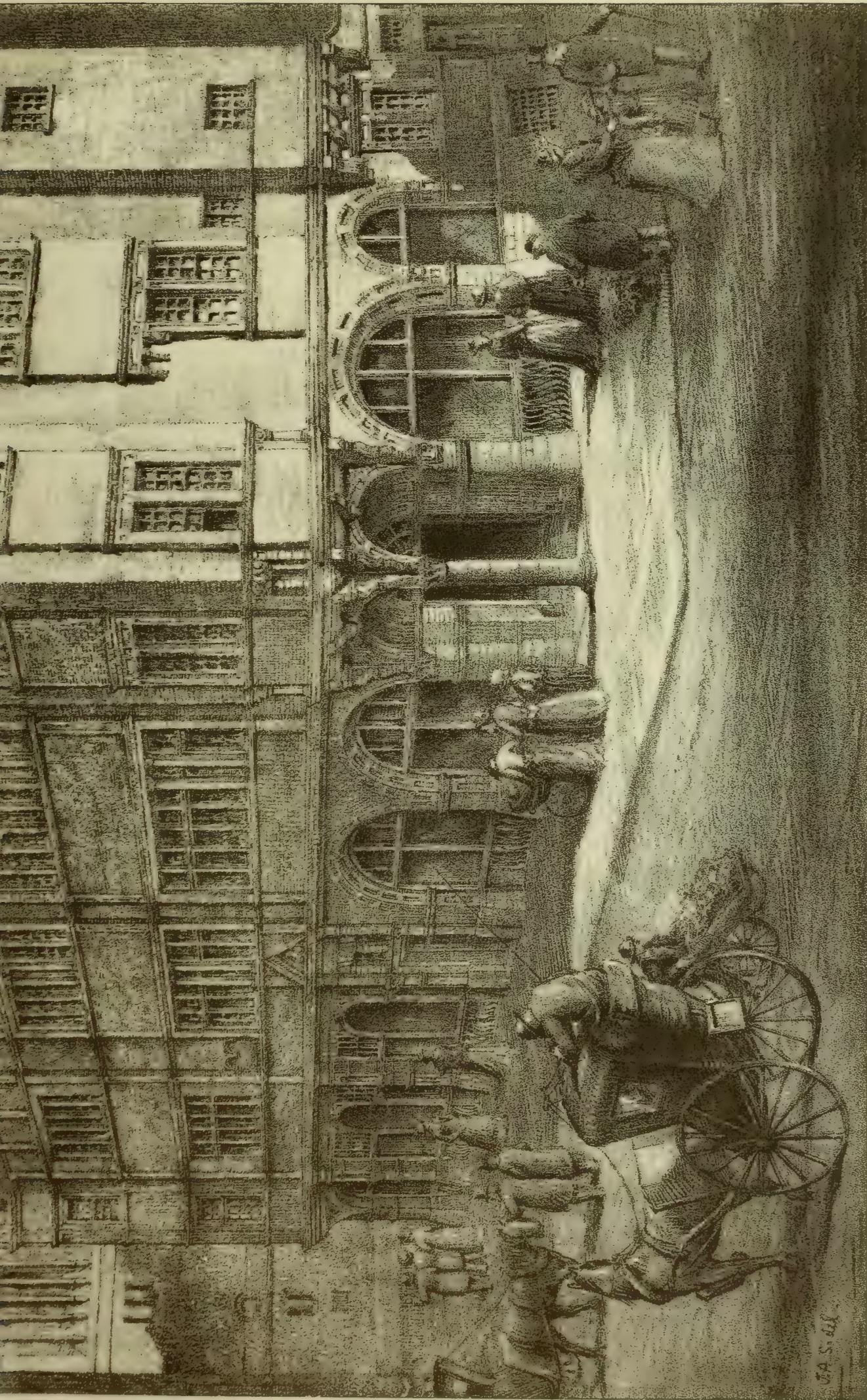
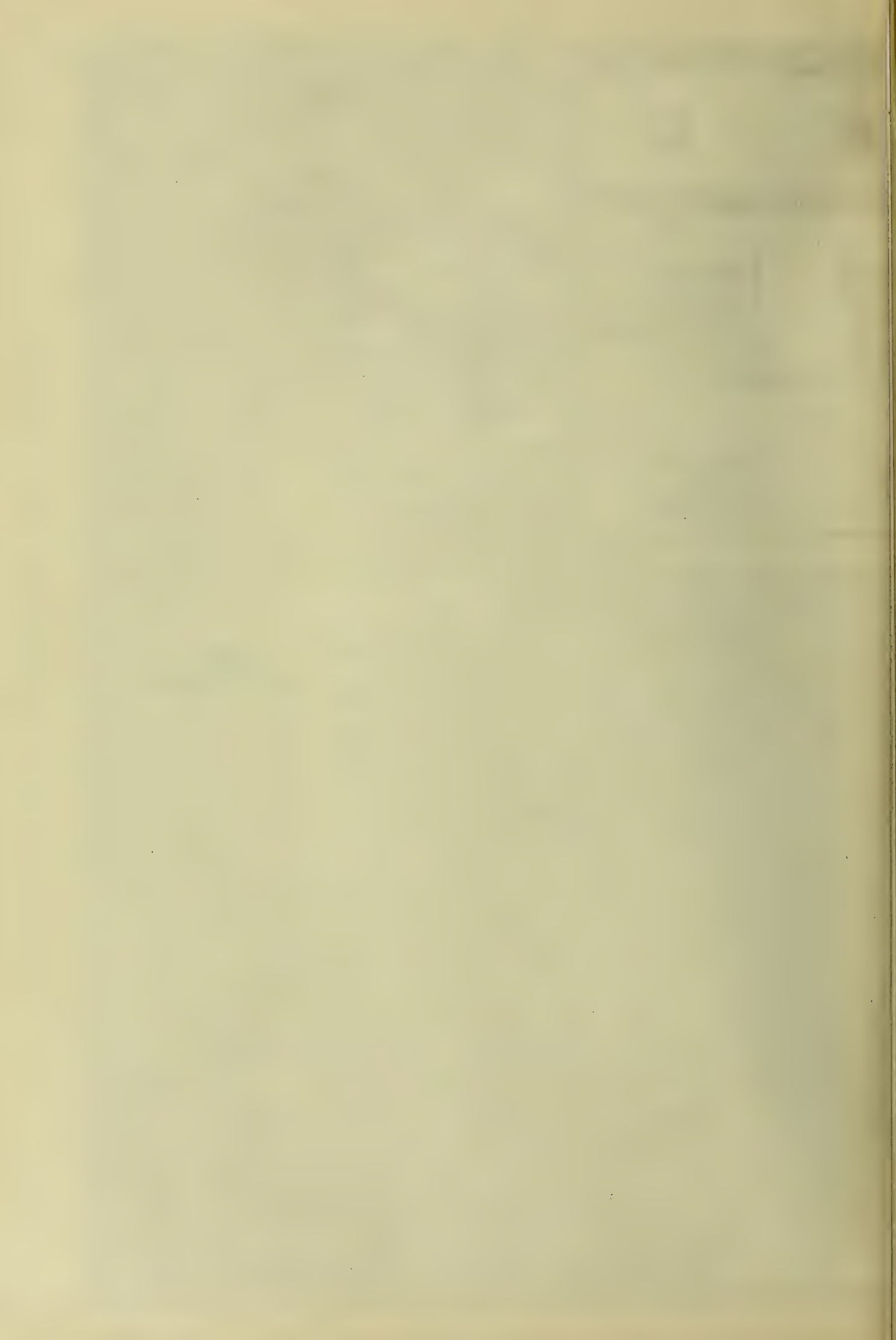


PHOTO-TINT, BY JAMES ASCHMAN, QUEEN-SQUARE, LONDON, W.

NEW PREMISES DUKE ST. GROSVENOR SQ. W. W.D. CAROE MA ARCHT











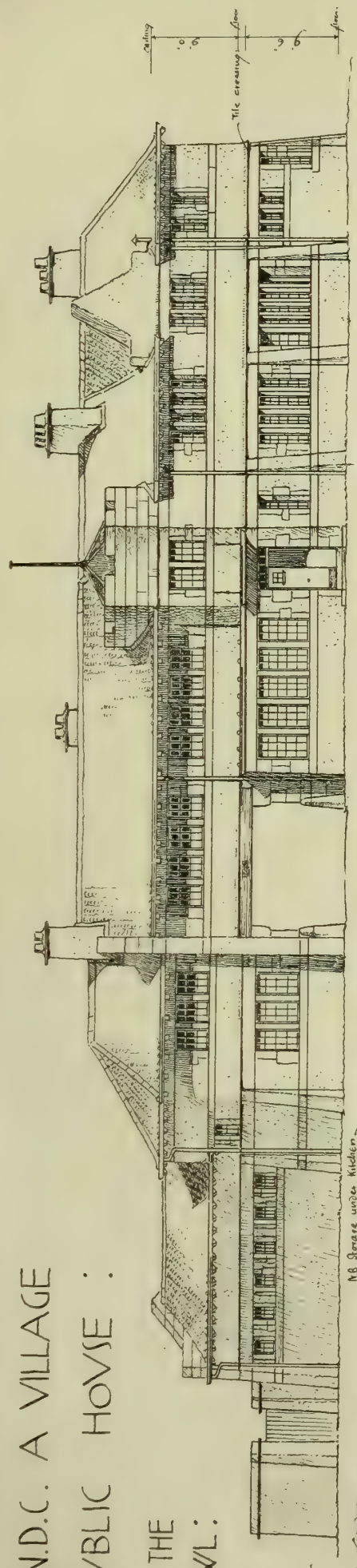
R. A. TRAVELLING STUDENTSHIP DRAWINGS BY JAS S. STEWART.



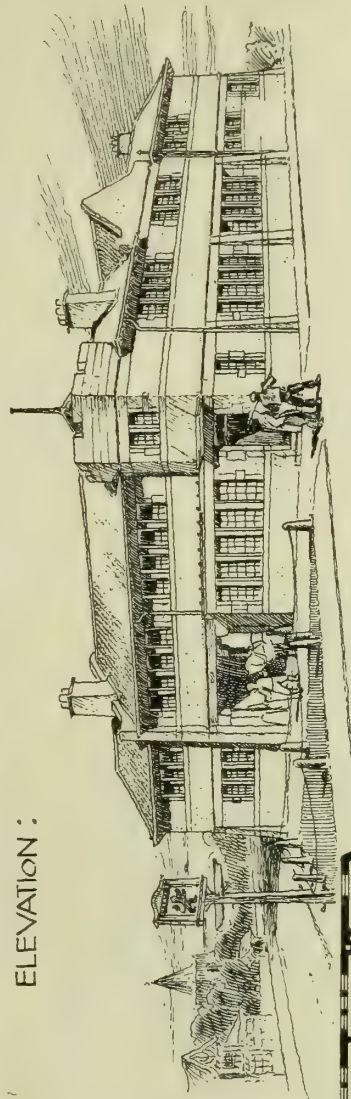
Old Houses  
Shrewsbury.



B.N.D.C. A VILLAGE  
PUBLIC HOUSE :  
BY THE  
OWL :

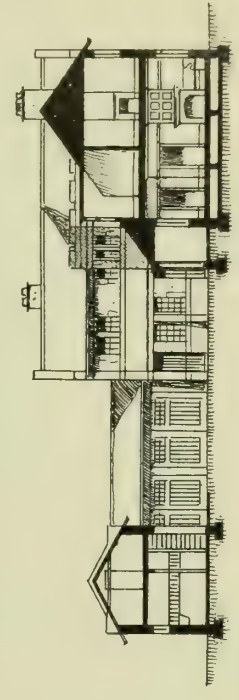


ELEVATION :



VIEW :

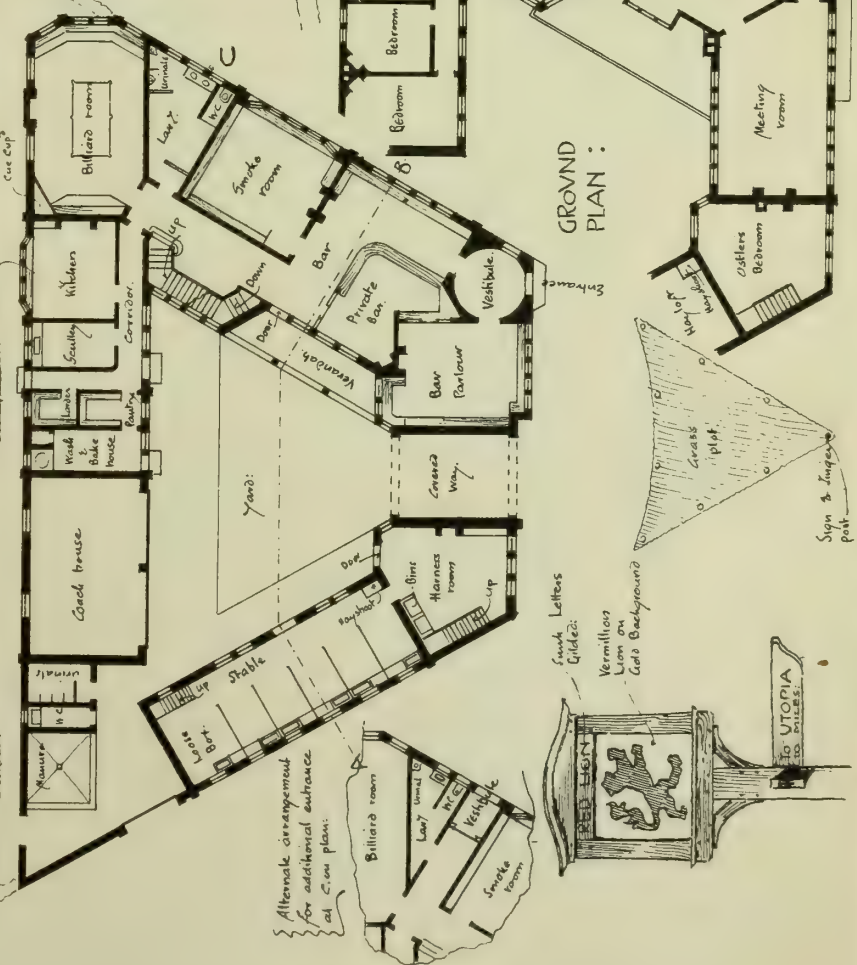
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SECTION A B :

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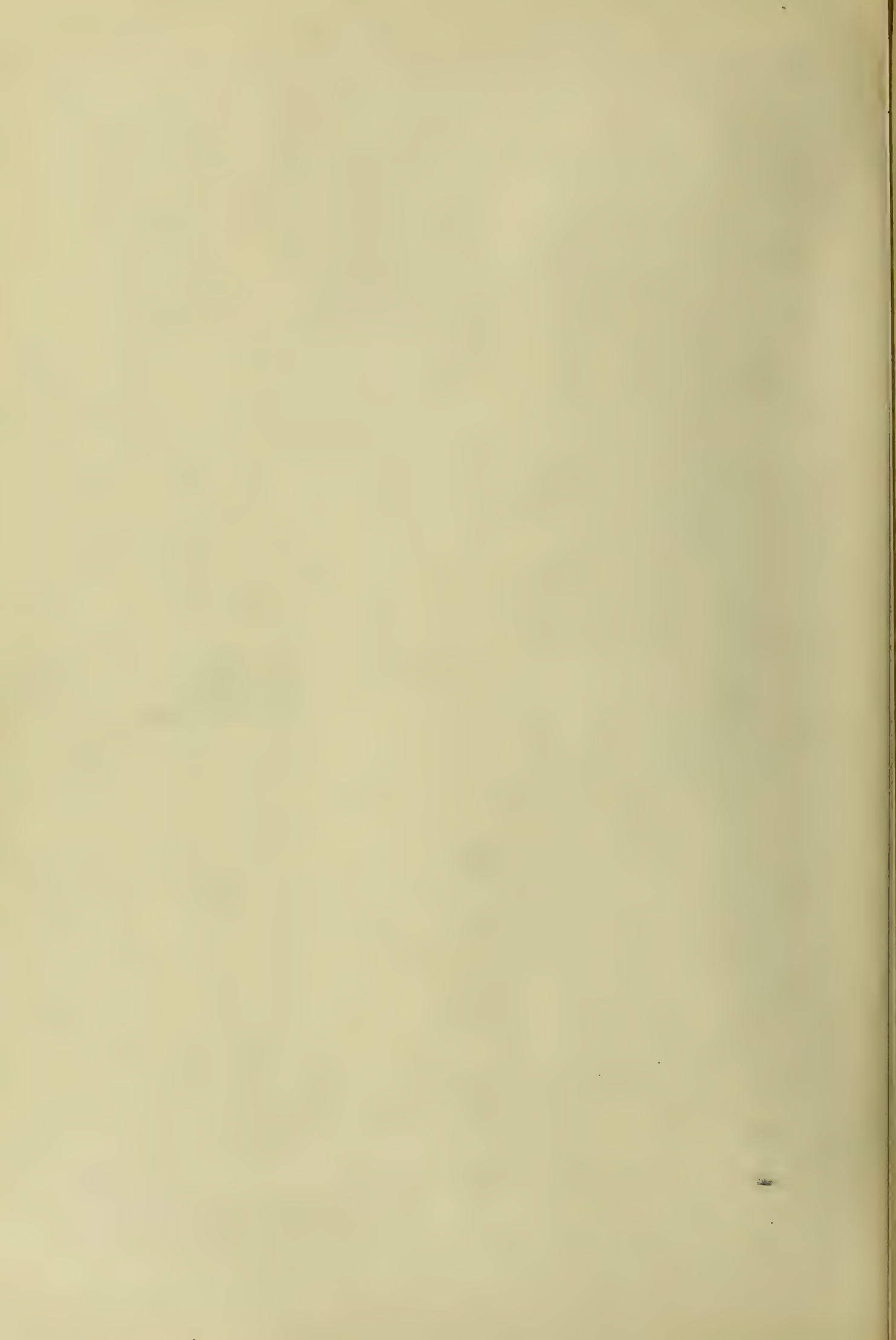
Scale for Plans 10 20 30 40 50 60 70 80 feet



GROUND PLAN :

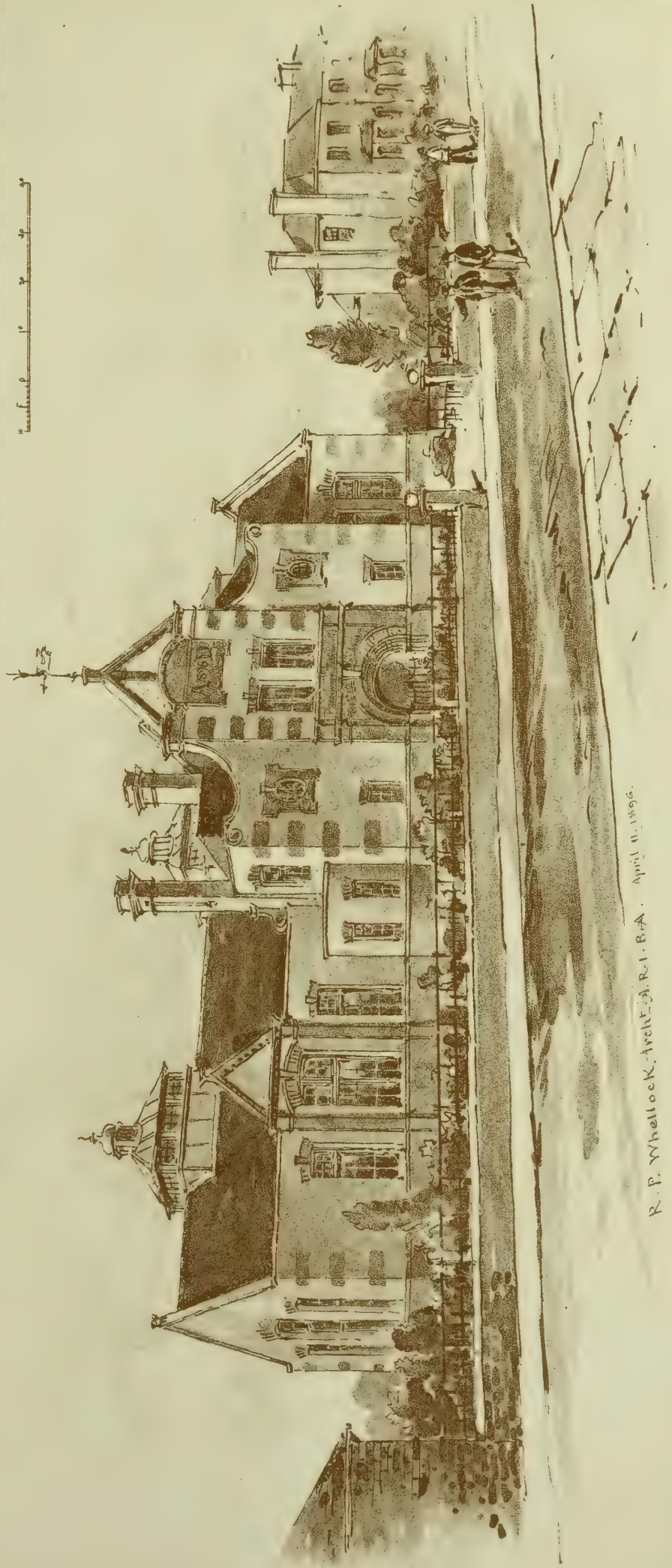
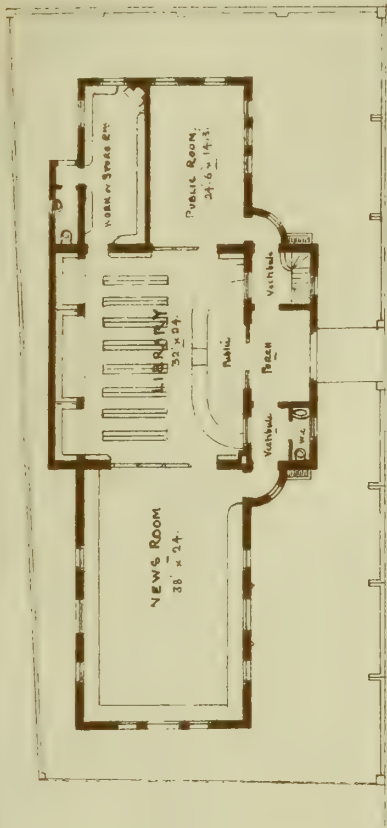
UPPER PLAN :







# PASSMORE EDWARDS PUBLIC LIBRARY NUNHEAD S.E.



R. P. Whellock, Archt. A.R.I.B.A. April 11, 1896.







• SHOP • PREMISES •  
WATERLOO • ST. SWANSEA •

{ C E Hannaford  
Herbert W Willy A.R.B.A.  
ARCHITECTS •





## Building Intelligence.

**ACCRINGTON.**—The St. John's Schools extension scheme has been brought to completion during the past week. It comprises a new infant school for 240 scholars, with cloak-room, lavatory, and teachers' room. A large classroom is separated from the main room by means of a glazed partition. The babies' room is entered directly from the entrance corridor, and provided with exit to play-yard. The building is faced with Halifax stone, has wood-block floors, and low-pressure hot water heating apparatus. The work has been carried out during the past twelve months by local contractors, under the direction of Mr. Henry Ross, A.R.I.B.A., of Accrington.

**BATH.**—The City Science, Art, and Technical Schools were opened on Tuesday. They adjoin the new municipal buildings, and have been built from plans by Mr. J. M. Brydon, F.R.I.B.A., of London. The building comprises four floors. In the basement are workshops for plumbing, painting, and woodwork, and laboratories for electrical and mechanical investigations. The rooms on the ground floor include a lecture-room, with seat accommodation for 240, fitted with appliances for scientific and other illustrated lectures, a smaller lecture-room, a library, the office of the director of studies, and a lecturer's room. The first floor is devoted to the school of art. The second floor contains the rooms of the domestic department. The chemical and physical laboratory is on the same floor.

**BELFAST.**—Some particulars as to the progress of the Belfast Cathedral scheme were made public by Vicar Canon O'Hara and Mr. J. L. Joyne, secretary, at the meeting of the Select Vestry of St. Anne's parish church, Belfast, on Wednesday week. The report read stated that in compliance with a resolution passed by the Select Vestry on May 2nd approving of the scheme brought forward by the vicar for the erection of a cathedral on the site of St. Anne's Church, a public meeting was afterwards held, at which an influential committee was appointed to co-operate with the Select Vestry in obtaining designs for a new and stately church which would serve as a parish church for Belfast and also as a pro-cathedral for the united diocese. After much consideration it was decided to intrust the work to Mr. Thomas Drew, of Dublin, and Mr. W. H. Lynn, of Belfast. These gentlemen, who are acting jointly, hope very soon to be able to present their report and designs. No general appeal has yet been made for funds for building purposes. The sum of £4,091 17s. has, however, been subscribed for this object, as well as £218 7s. in answer to an appeal for preliminary expenses. The vicar stated that about £20,000 or £25,000 would be required to provide a stately central church for the city.

**GRINTON IN SWALEDALE.**—The parish church at Grinton was reopened after restoration on Wednesday week. Of recent years the building had fallen into a very dilapidated condition. Messrs. Hicks and Charlewood, of Newcastle-on-Tyne, have been the architects; Mr. W. R. Simpson, of Darlington, was clerk of the works; and Mr. John Irwin, of Reeth, was the general contractor. The whole of the lead roof was taken off, melted, and relaid, and the old boarding entirely removed and replaced with new double boarding. The old rafters and purlins were cleansed from dry rot, washed with paraffin and retained. The walls outside were pointed, and inside were also pointed after having been cleared from plaster. Twenty new lamps of brass in brass bowls, suspended from the roof by iron chains (from Messrs. Jones and Willis, Birmingham), now light the building. New tapestry of 15th-century style has been placed in the sanctuary. The entire outlay has been £3,000.

**HASTINGS.**—The dedication ceremony of the Church House and Boys' Sunday School, situated in Hughenden-road, in connection with Christ Church, Blacklands, was performed on Tuesday week by the Bishop of Chichester (Dr. Wilberforce). The total cost of the premises will be about £1,780. The building is a three-storied one. On the ground floor there is a school-room, 50ft. by 23ft., with platform, and an ante-room, fitted with copper for tea meetings. The school-room is divided in the centre by revolving shutters, and is fitted with bookcases. The walls are relieved by wooden dado, and the picture-rail ceiling is wood-panelled. A stone staircase, with

iron balusters, leads to the club-rooms on the first floor. The men's reading-room, 16ft. by 12ft., and smoking-room, 16ft. by 12ft., face the Hughenden-road, while the boys' club-room, 23ft. by 12ft., is in rear. There is also a parish-room for sewing classes, &c. On the second floor are one sitting-room, three bedrooms, and kitchen for the caretaker. Mr. W. E. Warman was the builder, and the ironwork was supplied by Mr. Long, of Bank Buildings. The arches and dressings are in Elliott's paving stone, this part of the work being executed by Mr. P. Jenkins. The architects were Messrs. Jeffery and Skiller, of Havelock-road, Hastings.

**LEEDS.**—Additions to the Green-lane Board Schools were opened on Monday. The building, which has been erected from designs prepared by Mr. W. S. Braithwaite, of South-parade, Leeds, is in the Late Tudor-Gothic style, and is built of red brick, relieved with stone dressings. It is intended for the junior boys and girls, and has been erected on a portion of the playground in front of the existing schools, facing to Green-lane. The new school has a frontage of 238ft., and a depth of 37ft. Owing to the limited site, it has been erected on the corridor principle. It provides accommodation for 250 scholars, in four classrooms on the ground floor, which contains in addition a cooking-room, scullery, and a manual instruction room, 56ft. by 33ft., for 80 senior boys. The Green-lane pile of schools with the playground now form a quadrangle 8,000 square yards in extent, and the various departments, which, taken together, provide accommodation for 2,110 children, constitute the largest group of school buildings in the city.—The first of the new buildings erected on the ground occupied by the Central Market, which was destroyed by fire a few years ago, is now completed, and is to be opened for business to-morrow (Saturday). The premises are occupied by provision merchants, and they form the northern portion of the site, having a frontage of 34ft. to New Market-street, one of 84ft. to Central-road, and one of 50ft. to Back Central-road. Advantage has been taken of the opportunity which the demolition of the old market presented to effect a public improvement by widening and rounding off the roadway opposite the Corn Exchange. The elevations are faced with pressed bricks, relieved with cleansed stone dressing. There are three floors above the ground, and the total floor area is 1,550 square yards. The portion of the ground floor nearest New Market-street will be used for the retail business, the wholesale department will occupy the remainder of the ground floor, while the basement and upper floor are occupied for warehousing purposes. Free employment has been made of white glazed bricks and concrete. The building has been erected from design prepared by Messrs. Ambler and Bowman, architects, Park-place, Leeds, and the work has been carried out by Messrs. Wm. Nicholson and Son, Messrs. Dyson, Messrs. Stephen McFarlane, and Messrs. Oldroyd and Co., all of Leeds.

**NEEDHAM MARKET.**—A board school has been opened at Needham Market, East Suffolk. It is situated at the rear of the town-hall and parallel to the main street of the village. It is constructed of red bricks, relieved with Portland stone dressings, and roofed with Broseley tiles. The principal feature is a tower at the north-west corner, with bell turret in the roof, beneath which is a room that will be used as a board meeting room. This is reached by a staircase, and below is the boys' cloak-room. There are separate entrances for girls and infants, with cloak-rooms for each, fitted with Adams's lavatories. The school has accommodation for 375 scholars, the mixed department seating 225 scholars, and the infants' department 150. In the former the main room, which is 75ft. in length, with a width of 22ft. 6in., and height of 18ft., seats 145; whilst there are two classrooms, each seating 80 scholars. The infants' department consists of one principal room, with seating accommodation for 100, and a babies' room, holding 50. The out-buildings consist of earth-closets. The total cost has been £2,900, and the work has been carried out by Messrs. Wm. Theobald and Sons, builders, Needham Market, from designs by Mr. J. Shewell Corder, architect, Ipswich.

**TICKHILL.**—The parish church of Tickhill, near Doncaster, a large structure of the 12th and 14th centuries, was reopened on Friday after restoration. The chancel walls, which were of rubble-stone, in a bad condition, the whole being covered

with plaster, have been re-faced with Roche Abbey ashlar stone, a similar material to that used in the nave. A window over the chancel arch has been filled with stained glass. The subject illustrated is "The Transfiguration." Our Lord being represented in the central light, whilst at the sides are Moses and Elias. In the lower lights are the three Apostles. This work was executed by Messrs. Powell Brothers, of Leeds. The mortuary chapel of the Laughton family has been opened out and set apart for daily service. This part of the building was formerly used as a vestry and organ chamber, and the alterations have necessitated new arrangements. The organ has been moved from its former position in the chancel, and now faces west, on which side a new front of carved oak has been placed. The design was by Mr. J. Oldrid Scott, F.S.A., London, who was the architect in regard to the Laughton Chapel improvements. The chapel itself is separated from the chancel by an ancient rood screen, which has also undergone restoration. The new vestry has been made in the south-west corner of the nave, and is provided with an oak screen, the work of Messrs. Badger and Son, of Sheffield, the designs having been furnished by Mr. J. D. Webster, of Sheffield, who has been the architect for the restoration, with the exception of the Laughton Chapel. The 16 clerestory windows have been filled with cathedral glass. The contractor for the masonry and other work has been Mr. R. H. Rawson, of Tickhill. The total expenditure has amounted to upwards of £1,600.

**WOLVERTON.**—St. George's Church was reopened last week after enlargement carried out at a cost of £3,000, from plans by Mr. J. Oldrid Scott, F.S.A., of London. The work has been executed by Mr. H. Martin, of Northampton. The enlargement consists of new transepts on the north and south side, each 40ft. in length and 18ft. in width. The tower has been thrown into the church, and is connected with the nave and north transept by two pointed arches. The new oak seats, forty-nine in all, have been entirely made by a number of coach-finishers and coach-makers in their leisure time, spread over several months. The carving on the ends of the seats, and the renovation of the old pulpit, gallery, and seats have been carried out by others, employed at the London and North-Western Railway Company's Works in the village.

### CHIPS.

Five new stained-glass windows were unveiled at Easter in the parish church of Norton, East Kent.

A new supply of water has just been provided for South Brent. The water is brought from Gaisford, a distance of ten miles, in a 4in. iron pipe, and is directly connected with the existing mains without passing through the reservoir. The work has been carried out by Messrs. Veale and Son, under the direction of Mr. C. G. S. Adcock, the surveyor to the district council, and has cost about £700.

Mr. Peter Coats has promised a donation of £10,000 towards a new infirmary at Paisley. Mr. Coats previously subscribed £5,000, and is also building a Nurses' Home at a cost of about £10,000.

A large block of business premises, four stories in height, have just been erected at the corner of Westgate and Cross-street, Newcastle-on-Tyne, from designs by Mr. J. W. Taylor, of that city.

After the Easter holidays business was resumed at Tokenhouse-yard on Thursday, when six firms of auctioneers held sales, resulting in an aggregate of £28,375. Competition was brisk throughout the day.

Mr. Digby Collins is about to cut down a large fir plantation, known as Deer Park, near the road to Newquay, in the parish of St. Erme, near Truro. The wood contains over ten thousand fir trees, and also many fine oak and beech trees. The cutting-down and sawing-up of so much timber will necessitate the employment of very many hands. The purchasers are Messrs. Bowermans, of Somerset, railway contractors and timber merchants.

The highway committee of the Southport Town Council recommend the appointment as borough engineer and surveyor, at a commencing salary of £280, of Mr. R. P. Hirst, assistant surveyor, Mr. F. H. Taylor being promoted to the assistant surveyorship, Mr. W. R. Crabtree (son of the late borough surveyor) to be advanced as first assistant, and Mr. A. Harper as second assistant.

At the meeting on Tuesday of the Middlesbrough School Board, Mr. J. M. Bottomley, of Middlesbrough and Leeds, was appointed architect for the new schools to be built in Martin-road, to accommodate 1,000 children at an estimated cost of £7,500.



## OBITUARY.

WE regret to announce the death of Mr. ARTHUR BILLING, F.R.I.B.A., till recently the head of the firm of Arthur and A. E. Billing, of Bath Chambers, Tooley-street, which occurred on Monday last at his residence, 5, Peterborough-villas, Fulham. Mr. Billing, who was in his 73rd year, entered the office of the late Mr. Benjamin Ferrey in 1847, and afterwards became assistant to the late Mr. Philip Hardwick. He subsequently joined Mr. A. S. Newman, of Tooley-street, as junior partner, the firm subsisting until Mr. Newman's death in 1873. He enjoyed an extensive and varied practice, his works including many church restorations and enlargements, and new churches at Meyringen, near Interlaken, Hammerwinch, All Saints', Hatcham; Kidmore End; St. John, Chelsea; St. Peter, Fulham; and St. Augustine, Stepney. He designed many wharves and warehouses below London Bridge, and was for many years surveyor to Guy's Hospital, to which institution he added a new operating-theatre, classrooms, coroner's-court, and houses for the medical staff. From 1873 to 1885 he held the appointment of surveyor to the St. Olave's District Board of Works, Southwark. He had been a Fellow of the R.I.B.A. from 1863 until 1894, when he was placed on the list of Retired Fellows. We gave his portrait in our issue of June 20, 1890.

THE death is announced of Mr. GEORGE A. VICKERY, who has been clerk of works to Earl Portsmouth for nineteen years—sixteen years on the estate at Eggesford in Devonshire, and three years at Hurstbourne Park, near Andover, superintending the erection of a new mansion which is still incomplete. Mr. Vickery had entire charge of the erection of this building, which was estimated to cost £100,000, but which sum will, no doubt be much exceeded. No contractors were employed, the work being done almost entirely by workmen employed by the deceased. Mr. Vickery, previous to going to Eggesford, had been clerk of works for several years to Mr. J. F. Gould, architect, of Barnstable, in which capacity he superintended the restoration of Winkleigh, Down St. Mary, and several other churches. He was 64 years of age, and had been a member of the Clerks of Works' Association for the past six years.

THE death is announced of Gen. Thomas L. CASEY, for many years chief of the engineers in the U.S. army, and who was well known as the "completer" of the Washington Monument, the highest structure in America (555ft.). General Casey was engaged in superintending the construction of the Congressional Library at Washington, when he fell down and suddenly died.

Herr Charles Humann, the German archaeologist, has died at Augsburg, aged 57. Herr Humann was specially known for his excavations at Pergamos from 1878 to 1884, and for the surveys he executed for the Turkish Government in Palestine and in the Balkans.

The City Commissioners of Sewers received a report on Tuesday, stating that the quinquennial valuation of the Metropolis shows the gross value of property in London, including the City, to be £43,131,559, and the rateable value £36,680,648. For the City the gross value is £5,315,905, and the rateable value £4,454,740.

A new reredos and other gifts have been presented to the church of St. Matthew, Naburn, and were dedicated by the Archbishop of York on Monday week. Besides the reredos, the gifts consist of seven antique Venetian brass lamps, which are hung across the chancel arch, and brass altar-rails. The reredos is a memorial, and takes the form of an oil-painting on three panels, set in a gilt tabernacle frame. The subject of the picture is "The Crucifixion," with SS. Mary and John, adoring angels being painted on the side panels. The artist is Signor Bargellini, of Florence.

At St. Mary's Collegiate Church, Port Elizabeth, Cape Colony, a new font has been provided. It was designed by Mr. Sydney Stent, F.R.I.B.A., of Cape Town, and executed by Messrs. Harry Hems and Sons, of Exeter. It is 13th Century in style, and is carried out in Caen stone, with English alabaster shafts, and a Portland stone platform slab.

A service was held in St. Mary's parish church, Rickmansworth, last week for the dedication of the new east window. It has been erected by Messrs. William Morris and Co. from designs by Sir E. Burne-Jones. It represents the Crucifixion of the Saviour, the three Marys, St. John standing near in rapt devotion and grief, whilst above are attendant angels. The window is in memory of the late Lord and Lady Ebury of Moor Park.

## Engineering Notes.

BLACKPOOL.—The Gigantic Wheel, now being erected on the site of the old bowling-green in a corner of the Winter Gardens, Blackpool, was commenced on December 1st, 1895. The work of erecting the supports was not finished until the third week in March, and then the most difficult portion of the work—viz., that of hoisting the axle—was commenced. The axle, a steel forging weighing over 28 tons, and measuring nearly 41ft. long and 26in. in diameter, was forged at the works of Messrs. W. Beardmore and Co., of Glasgow. The axle and bearings being fixed complete, the work of building the rims of the wheel will be pushed forward rapidly, under the direction of Mr. Walter B. Basset, who also built the Earl's Court Wheel. The carriages, thirty in number, and each capable of carrying forty persons, are rapidly approaching completion in the works of Messrs. Brown, Marshall, and Co., of Birmingham. The driving engines and most of the intermediate gearing are already in position in the engine-house. These engines will operate two steel wire ropes, one on either side of the rim of the wheel, and arrangements having been made and provided for in such gearing to enable the wheel to be turned at a quicker speed than that at Earl's Court, the Blackpool Wheel will be able to carry more passengers per hour than its predecessor in London. The particulars of the great wheel are:—Total height above sea-level, 250ft.; total diameter (across centres of pins), 200ft.; total weight, 1,000 tons. The solid axle is of a diameter through the journals of 2ft. 2in., a diameter across the flanges of 5ft. 3in., length over all 41ft., and weight 28 tons.

BREEZE HILL RESERVOIR, BOOTLE.—The members of the Liverpool Engineering Society, on the invitation of Messrs. Holme and King, the contractors for the works at Breeze Hill now being constructed, and approaching completion, for the Liverpool Corporation, visited them on Saturday afternoon last, headed by Mr. A. J. Maginnis, president, and were received by Colonel Arthur Hill Holme, J.P., who took them round and explained in detail the works. This reservoir is being constructed principally to supply the northern parts of Bootle and Walton with water, and will contain a total of a little over 6,000,000 gallons. The water area at the top, including the pillars, is equal to 64,320sq.ft., whilst the total area of the site is 11,250 square yards.

BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—A meeting to establish a British Association of Waterworks Engineers was held on Saturday at the Westminster Palace Hotel, under the presidency of Mr. D. M. F. Gaskin, of Nottingham. Representatives were present from all parts of the country. The chairman submitted a draft copy of the constitution and rules for the management of the association, which had been drawn up by a provisional committee. It was pointed out that the object of the association would be, among other things, to promote and facilitate the interchange of information, ideas, and practice amongst its members on all matters pertaining to waterworks undertakings, to the mutual advantage of water authorities and consumers; to invite from the members and others communications, written or oral, relating to waterworks engineering, management, and finance, and to receive, hear, and discuss such communications at meetings of the association or elsewhere; to invite the exhibition of, and to exhibit at meetings of the association or elsewhere, any new improved machinery, apparatus, plans, drawings, or models calculated to advance the knowledge of waterworks engineering and management; to assist the Legislature, public bodies, and others in ascertaining the views of persons engaged or interested in waterworks undertakings; to originate and promote improvements in the law, and to support or oppose alterations therein in all matters relating to waterworks; to watch over, promote, and protect the mutual interest of its members, and to provide facilities for promoting and maintaining, professionally and socially, a spirit of fraternity amongst its members. One of the objects of the association will be to appoint examiners and to hold examinations. The rules having been agreed to with slight verbal alterations, Mr. Gaskin was elected the first president; Mr. H. A. Hill and Mr. Matthews, Southampton, vice-

presidents; and Mr. W. G. Pierce, of Richmond, Surrey, hon. secretary and treasurer. A council of ten was also elected by ballot. At a subsequent meeting of the council Mr. W. H. Brothers, of Birmingham, was appointed general secretary.

## CHIPS.

The Employers' Associations at Glasgow, Motherwell, Edinburgh, Leith, and Paisley have each conceded to their joiners an advance of one-halfpenny per hour, together with other improvements in the working rules; whilst at Shettleston, in Lanark, an advance of one penny per hour has been obtained.

In memory of the late Sir John Ogilvy, Bart., of Baldovan, Sir Reginald Ogilvy, Bart., has erected a Celtic cross in Strathmartine churchyard, near Dundee. The cross, which is 11ft. in height, has been designed on the model of one of the standing crosses of Iona. It is placed on a base of three steps, and these have been utilised for a commemorative inscription. The family burying-place, where the cross has been erected, is inclosed by a stone parapet wall with a wrought-iron railing of unique design. The school of the adjoining Ogilvy Orphanage has at the same time been converted into a chapel.

The urban district council of Featherstone have adopted plans by Messrs. Hodson for the drainage of Loscoe and North Featherstone at an estimated cost of £9,000.

The bursar of Brazenose College, Oxford, has instructed Mr. J. C. Traylen, of Stamford, to repair the gateway of Brazenose College, Stamford.

A Bible Christian chapel was opened at Mevagissey, Cornwall, on Good Friday. The new premises comprise chapel, school, and vestries, and have been built by Moyle and Mitchell of Chacewater, from plans of Mr. C. F. Joery, of St. Austell, at a cost of about £1,700. The chapel is lighted with electric light. Stone for the building was presented by Mr. Tremayne, of Heligan.

Hastings Harbour will be commenced in May, the capital having been subscribed.

The Bishop Suffragan of Derby, the Rev. E. A. Were, D.D., visited Dore Church on the 8th inst. to consecrate the chancel which has been erected as a memorial to the late vicar, the Rev. J. T. F. Aldred, M.A., who was vicar of the parish for 45 years. The plans were prepared by Mr. J. D. Webster, of Sheffield, and the contract was let to Mr. Joseph Fletcher, of Dore, the masonry being sub-let to Mr. S. Hancock, of Fulwood. The dimensions of the chancel, which replaces an apse, are 19ft. by 27ft., and it has been erected in grey stone to harmonise with the main body of the church. The seatings are of pitch-pine, and the roof is of the same material. The cost has been about £900.

The new schools, Garelochhead, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

New board schools have just been erected in Byars-road, Downhill, Govan. They are Italian Classic in style, are constructed of red stone from Locharbriggs, and accommodate 1,579 scholars. The cost has been £18,000. Messrs. Steel and Balfour, of Glasgow, were the architects; Mr. William Gordon was the contractor for masonry, and Messrs. Guthrie and Co. carried out the wrights' work.

Main sewerage works were inaugurated at Fails-worth, near Manchester, on Thursday in last week. The cost of the outfall works was £8,100, and of the entire undertaking, including land and laying of sewers, £34,800.

The Lord President of the Council has appointed Professor J. Perry, D.Sc., F.R.S., to the vacant chair of Mechanics and Mathematics at the Royal College of Science, London.

The monthly report of the Labour Department, published on Wednesday, states that employment in the building trades continues good, the percentage of unemployed in unions making returns being 2.6, compared with 2.5 in February and 4.9 in March, 1895. The furnishing trades are busy, the percentage of unemployed union members being only 1.0, compared with 2.6 in February and 4.9 per cent. in March, 1895.

The Council of the Society of Arts offer the Fothergill prize of £25 and a silver medal for a paper on "The Best Means of Effectually Preventing the Leakage of Current to Earth in Electrical Installations from Generating Heat and Setting Buildings on Fire." The paper should consist of about eight thousand words, and be written with a view to being read and discussed at an ordinary meeting of the society. Papers submitted for the prize must be sent to the secretary on or before October 1, 1896. Each paper must be typewritten, and bear a motto, the name of the writer being inclosed in a sealed envelope with a similar motto.



## COMPETITIONS.

**CHELTENHAM.**—Only sixteen designs have been received for the intended Kursaal in Imperial-square, Cheltenham, to be erected on a portion of the site marked out for the municipal buildings. The building is to be used in connection with the distribution of the Cheltenham mineral waters, which can be delivered from the wells at an elevation of 25ft. without pumping. The limit of the expenditure is fixed at £8,000. The principal elevation will face the promenade, and the arrangements are to include an organ and band orchestra, with accommodation as a social centre, for the pleasure of the town and its numerous visitors.

**WESTMINSTER.**—The limited competition, of which we gave some particulars a few weeks since, for new premises to be erected by the Surveyors' Institution in Great George-street, has been settled in favour of the design submitted by Mr. Alfred Waterhouse, R.A. The other competitors were Messrs. T. E. Colcutt, Charles Barry, G. T. Hine, and Henry Currey, F.S.I. The selected architect has favoured us with his consent for the illustration of his design, which we hope to publish shortly, with a description of the plans submitted.

## CHIPS.

The scheme for the extension of the west front of Manchester Cathedral has received the approval of the Dean and churchwardens. The estimated cost of the improvement is about £6,000, towards which Sir W. C. Brooks has promised £2,000, Mr. Lees Knowles, M.P., £500, Mr. J. W. Maclure, M.P. (senior churchwarden), £100, and Mr. A. Yerburch, M.P., £100. The work has already been begun.

A Local Government Board inquiry was held at St. Anne's-on-the-Sea, on Tuesday, by Colonel Luard into the urban council's application to borrow £1,413 for sewerage extensions and the provision of a stone-breaker. The sum of £677 was required for the extension of the sewer, so as to deal with the sewage from that part of Fairhaven situated in the St. Anne's district.

New board schools erected at Shirebrook for the Plesley School Board were opened on Tuesday. They accommodate 485 children, and cost £4,000. Mr. Ball, of Nottingham, was the architect, and Messrs. Osroft and Price were the contractors.

The completion of the restoration of the great Perpendicular church of St. Peter Mancroft, Norwich, was celebrated on Sunday by thanksgiving services. The works just finished, for which Mr. A. E. Street was the architect, have been confined to the tower, on which £1,100 has been expended.

It should have been mentioned that the altar-cross presented to Ripon Cathedral in memory of the late Mrs. Bickersteth, referred to in our issue last week (p. 546), was designed by Mr. G. F. Bodley, A.R.A., and executed by Messrs. Barkentin and Krall, of Regent-street, W.

The electric-lighting committee of the Islington Vestry have decided to increase their plant at once, with a view of extending their system of public lighting from the Nag's Head, Holloway-road, to the Archway Tavern at Highgate-hill, and also for the purpose of supplying the light to the Northern Polytechnic in the Holloway-road and the Royal Agricultural Hall.

Alterations are being made to the board-room for the guardians of Belper Union, and special consideration has been given to the ventilation, which will be carried out on the Boyle system, the latest improved form of the patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Mr. James Kenyon, M.P., has offered to give £1,000 as the nucleus of a fund for building an art gallery and free library at Bury, Lancs.

Mr. E. Killingworth Johnson, who has died suddenly in his 71st year, was first known to the public as a draughtsman on wood, and some of his drawings were engraved as far back as nearly half a century ago. For years he continued the practice of drawing on wood for the engravers. In 1866 he became an Associate of the Old Society, now the Royal Society of Painters in Water-Colours, and in 1876 he was elected full member. He was a constant exhibitor. Some of his principal pictures were—"The Midsummer Night's Dream," "The Rival Florists," "The Reader," "The Anxious Mother," "The Golden Swan," and "My Garden."

The town council of Bury, Lancs, have accepted the gift of a portrait of the late Alderman James Maxwell, F.R.I.B.A., J.P., the head of the firm of Maxwell and Tuke, of Manchester and Bury, who died in September, 1893. The portrait will be hung in the Municipal Technical School, Mr. Maxwell having been at the time of his death the chairman of the committee for erecting the building.

## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLIV., XLIX., LI., LIV., LVII., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

SANITAS. (Yes, that is the generally-received theory nowadays.)—C. TUCKER. (Write to B. T. Batford, 94, High Holborn, or call on him. He will recommend a book, and possibly supply at second-hand price.)

RECEIVED.—G. R. and Co.—J. Webber.—Renaissance.—C. W. B.—E. R. (Chester).—F. S. W. Co.

## Correspondence.

## A CORRECTION.

To the Editor of the BUILDING NEWS.

SIR,—I notice that it is stated in the BUILDING NEWS that the tender of Messrs. Moorsom and Co., of Manchester, has been accepted for the construction of the new promenade works here. I beg to state that this is not correct, the tender of Mr. J. Biggs, of Birmingham, having been accepted by the council.—I am, &c.,

WM. JONES.

Council Offices, Colwyn Bay, N. Wales,  
April 14.

The East Stirlingshire County Council, at a meeting held at Falkirk on Friday, discussed a proposal to promote a water scheme for Polmont, Redding, Brightons and district. The sub-water committee recommended that Messrs. Warren and Stewart, C.E., of Glasgow, be asked to revise a former report which they had prepared on a scheme for deriving the supply from the Manuel Burn, the water from which source has been found to be of a satisfactory kind. The committee's recommendation was agreed to. A provisional order will be applied for and the scheme carried out.

The ceremony of laying the memorial-stones of a new Central Higher Grade School, now being erected by the School Board in Great Moor-street, Bolton, took place on Friday. The new building, which will cost £36,000, is designed to take the place of three other schools previously used, but unsuitable to present-day requirements. It occupies an area of 25,587 sq. ft., with a frontage of 208ft. towards Great Moor-street. It will be four stories in height, Renaissance in style, and will provide accommodation for 1,080 scholars. Mr. R. Knill Freeman, of Bolton, is the architect.

## Intercommunication.

## QUESTIONS.

[11486.]—**Bolting to Rock.**—Will someone state from experience the comparative qualities of lead and Portland cement for running in bolts to holes in basalt rock by the seaside, subject to tides?—LEVEN.

[11497.]—**Cubing.**—Which of the two following ways of cubing up a building is the correct one?—viz., to include the external walls when measuring on plan, or to take the inside measurement. Also, give the rule as to height. Should the distance be taken from underneath ground-floor joists to half-way up roof when there are no cellars, and when there are to bottom of footings, or should the distance be taken from bottom of footings in every case?—JAS. PLATT WIDDOWS.

[11498.]—**Italian Scale.**—Will any reader please say what relation the scale in an Italian book ("Fabrice

10	9	8	7	6	5	4	3	2	1	0	10
Pied.											Parigini.

Antiche di Roma, Designate, Restaurate, e Desaitte da F. Turconi," published at Milan) bears to the English measures of feet and inches?—L. S. N.

[11499.]—**Verandah Roof Covering.**—Will any one of your numerous readers kindly inform me of any suitable, light, and durable material for covering a verandah roof other than glass, slates, tiles, lead, or zinc? It is to be fixed on an exposed sea front subject to heavy gales from the north-east.—G. B.

At Airdrie Dean of Guild Court plans were passed, on Friday, for the erection of a new church and hall for the United Presbyterian congregation at Coat-dyke. The church is to seat 600 and the hall 250, and the estimated cost is £3,000.

In the ventilation of the extensions now being made to Ayr Academy (Messrs. J. A. Morris and Hunter, architects), the "Climax" patent continuous-exhaust ventilators have been used and supplied by Cousland and Mackay, ventilating engineers, Glasgow.

Major-General H. D. Crozier, R.E., an inspector for the Local Government Board, held an inquiry at the Town-hall, Derby, on Thursday in last week, as to an application from the corporation for power to borrow £13,185 for purposes of electric lighting, £849 for the purposes of the technical college, £700 for the construction of a swimming-bath in the Markeaton recreation-ground, £600 for a contribution towards defraying the cost of a bridge and siding on the Nottingham-road, £454 for the improvement of Rosehill-street, £130 for making a footpath between Western-road and Gordon-road, £2,000 for an isolation hospital at the borough lunatic asylum, and £374 for street improvements.

At Audley, Staffs, memorial stones have been laid of a new Primitive Methodist chapel. The site is on the east side of Church-street. The chapel will be 66ft. by 57ft. The gallery will be semi-circular, and the choir seats will be behind the rostrum. Accommodation will be provided for about 700 worshippers. The style will be Gothic, and the materials used will be local bricks and stone. The contract for the whole work has been let to Mr. Daniel Maddock, of Audley, for the sum of £2,320, and the architect is Mr. J. D. Mould, of Manchester.

The members of the water committee of Glasgow Corporation made a private inspection on Friday of the new service reservoir at Craigmaddie, an undertaking which was started almost ten years ago. Originally it was expected that the works would be finished within five years; but difficulties were encountered in the formation of the puddle trench for the embankment. The inauguration ceremony will take place in May, when the water will be turned into the reservoir, the capacity of which is 700,000,000 gallons, equal to fourteen days' supply.

The new church at Rufforth was consecrated by the Archbishop of York on Thursday in last week. It is Late Decorated in style, and consists of chancel, nave, and south aisle. It has a square tower, capped by a dwarf spire. The walls are of Killinghall stone, with Whitby stone dressings; and for internal work Tadcaster stone is used. Messrs. Demaine and Brierley, of York, are the architects, and Mr. J. Gould, of Leeds, is the builder. We illustrated this church, which is seated for 180 people, in the BUILDING NEWS for July 27, 1894.

On Saturday night a fire involving great destruction to plant broke out in the timber-yard belonging to Messrs. John Fleming and Co., Limited, Albert Quay, Aberdeen. The flames originated among shavings in the vicinity of the engine-house, situated in the centre of the yard. The plant destroyed included four flooring-machines, the same number of frame-saws, and a couple of overhead cranes. The timber consumed consisted largely of mahogany, teak, Baltic logs, and battens, and some 1,500 loads of timber were burned. The portion of the structural yard consumed is valued at £9,000, and the stock is estimated at £11,000, making a total loss, covered by insurance, of £20,000.



## Legal.

### GAS COMPANIES' LIABILITIES.

WHERE a gas company supplies bad gas—or, in other words, gas which is deficient in lighting power, and very impure—what, if anything, can be done with them by the customer and consumer? In the ordinary way, it would have seemed that an action for damages could be maintained in this, as in other similar cases of a breach of contract to supply a specific article for a known and special purpose. But it seems that, with regard to the gas companies, there is no such remedy for individuals. In the recent case of "Clegg and others v. The Barry Gas Company, Limited" (*Times*, March 3), the plaintiffs had sued the company for £50 damages, on the ground that the gas supplied to them was very bad indeed. The County Court judge, while holding that the plaintiffs had certainly suffered the damage claimed, also decided that they had no ground of action against the defendants upon the claim stated. The plaintiffs appealed to the High Court, and the case came on before Justices Wills and Wright.

It was argued for the plaintiffs that although there was no contract between the parties as to the supply of gas, still the plaintiffs' common law right of action for damages in regard to that supply was not taken away by the statute regulating the Gas Company, and therefore remained, although the company could be proceeded against for the penalty they had incurred. On the other hand, it was urged that as the duty of supplying gas was only a statutory duty, no right of action to an individual affected by breach of that duty could arise. Ultimately, the Judges adopted that view. They held that as the supply of gas was regulated by a public Act of Parliament, there was only a statutory duty imposed upon the company, and as this affected a large number of persons, the proper remedy was by indictment, or by taking such proceedings as the Act itself provided. They ruled that the obligation on the company's part to supply gas did not depend upon contract, but upon statute. Contracts were made by the company, but these only regulated the price and mode of payment. When a rule of law was made by a statute, and that statute provided a specific remedy, that was the only remedy available. They therefore dismissed the appeal, and the Gas Company goes scot-free, until its customers combine to present an indictment, or proceed for penalties. **FRED. WETHERFIELD, Solicitor.**

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

**H. E. A.—ADJOINING OWNER.—RIGHTS.**—I can only suggest that B. should give a written notice, objecting to the trespass upon his land, and, if not remedied, sue in County Court for damages, to raise the question. But he seems to have consented to it for the last nine years!

**C. OF W.—CLERK TO WORKS.—NOTICE.**—You seem to be entitled to a week's notice, at least, and probably a month, but not more. You can only summon the company for damages by an action for wrongful dismissal.

The Board of Trade, in a special report, condemn *in toto* the Chester Corporation Bill, under which it is proposed to authorise the construction of a weir or tidal dam in the river Dee. The Board refrain from suggesting any amendment of the Bill, as it appears to them that no modifications as regards the proposed works could sufficiently protect the public interests under their supervision from the serious injury with which they are threatened.

The personal estate has been valued at £419,249 7s. 9d. of Mr. John Lysaght, of Hengrave Hall, Suffolk, and Springfield, Stoke Bishop, Gloucester, J.P., and of John Lysaght, Limited, St. Vincent Ironworks, Bristol, Swan Garden Ironworks, Wolverhampton, and Osier Bed Ironworks, Wolverhampton, who died on October 1 last, aged 63.

Colonel J. T. Marsh, R.E., held an inquiry at Bangor on Friday, respecting an application to the Local Government Board for powers to borrow money for the purpose of the ferry undertaking and for dredging a portion of the Menai Straits; £1,100 for the purchase of ferry steamers, £500 for hospital purposes, £350 for works of street improvements, £500 for provision of a steam road roller, and £230 for works of sewerage. Mr. Rodway, the deputy town-clerk, and Mr. Gill, the borough engineer, appeared on behalf of the council.

### LEGAL INTELLIGENCE.

**THE LONDON COUNTY COUNCIL SUMMONED UNDER THE BUILDING ACT.**—At the North London Police Court on Friday, the London County Council were summoned before Mr. Paul Taylor at the instance of Mr. Samuel Meeson, one of the Council's district surveyors, for a contravention of the London Building Act of 1894, in erecting a shed on Hackney Marshes without giving the district surveyor notice. Mr. Berry, who appeared for the County Council, called attention to the form of the summons, which, he said, was bad, and he pointed out that in the first part of the form the Act of 1894 was mentioned, and lower down the Act of 1855, while further on it was stated that the offence was "contrary to the said Act." He desired to know under which Act the summons was taken out. Mr. Jutson, for the prosecution, said that the summons was under the Act of 1894. Mr. Berry said if that were so, he had a very simple answer. The building was put up before the Act of 1894 came into operation. Mr. Jutson said that it had only recently been discovered by the district surveyor, and when the Council were written to and asked if they had any explanation to offer, they replied that they did not see the cause for the district surveyor's interference. Mr. Berry read the copy of the letter sent to Mr. Meeson, in which it was stated that the building was a temporary structure for the accommodation of workmen employed on the Hackney Marsh improvements, and if notice was really necessary the department must comply with the Act; but at the same time it was pointed out that Mr. Meeson was rather straining the object of the Act. As this structure was put up before the 1894 Act came into operation, and as no offence was committed under the older Act, Mr. Meeson was clearly out of Court. Mr. Paul Taylor said that Mr. Meeson should have been told that the building was erected before the Act came into operation. As he had not been given this information he would not have to pay costs. The summons was dismissed.

**RE ALFRED REED AND SON.**—A first meeting of creditors was held on Monday. The debtors were builders and contractors, carrying on business at Burford-road, Stratford. The liabilities were returned in the statement of affairs at £7,818, of which £6,009 was expected to rank; and the assets were estimated at about £4,200. The failure was attributed to pressure by creditors and lock-up of funds in a current contract; also to loss on contracts and other causes. The debtors had entered into contracts with the West Ham School Board for the erection of schools. The meeting was adjourned to May 11 to enable the debtors to submit a proposal for a secured composition of 7s. 6d. in the pound, payable by instalments.

### CHIPS.

The Gateshead School Board are inviting competitive designs for new offices.

A clock, with three 6ft. dials, and striking hours on large bell, has been erected in Hugglescote church, Leicestershire, by Messrs. John Smith and Sons, Derby, and was formally started on the 9th inst. by the donor, Mrs. Wills.

The managers of the Metropolitan Asylums Board have received the sanction of the Local Government Board for the erection of additional pavilions and workshops at the South-Eastern Fever Hospital, at a cost not exceeding £21,350.

Mr. J. S. Dunn, of the Poplar Board of Works, has been appointed, under the engineer of the Cape Town Corporation, to assist in supervising the reconstruction of the main drainage system of that city.

Woodford parish church, Northamptonshire, was reopened by the Bishop of Peterborough last week, after being reseated and restored.

The urban district council of Watford have voted their engineer, Mr. D. Waterhouse, 150 guineas, as remuneration for extra work involved by the inception and carrying out of the high-level sewer scheme.

In connection with the lectures arranged by the Sanitary Institute for the benefit of sanitary officers, an inspection and demonstration took place at the East London Waterworks on Wednesday last.

The city council of Sheffield, at their last meeting, decided to raise the salary of Mr. Charles F. Wike, the city surveyor, from £800 to £1,000 a year. The salary had remained at the present figure since Mr. White was appointed eight years ago.

New Wesleyan Sunday-schools, adjoining an existing chapel, were opened at Wedmore, Somerset, on Friday. Mr. Edward Wall was the architect.

The curator of the art-gallery at Sheffield reports that the large increase in total visitors during the year is more than accounted for by the increase in the attendance on Sundays, Sunday visitors being over 9,000 in excess of the same period last year. The average attendance on Sunday is over 2,000.

### WATER SUPPLY AND SANITARY MATTERS.

**THE WATER SUPPLY OF SMALL TOWNS.**—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, Mr. S. Herbert Cox, president, in the chair, a paper was read by Mr. Percy Griffith, A.M.I.C.E., M.I.M.E., on "The Water Supply of Small Towns and Rural Districts." The author referred to the importance and difference between large and small works of water supply. Among these were the greater (proportionate) length of mains and the heavy capital charges entailed by small works, the absence or scarcity of trade supplies, the low rateable value of property, and the consequent necessity for high rates of charge for water, and also the uncertain nature of the demand for water. Attention was drawn to the enlarged powers vested in local authorities by Parliament in recent years with a view to the purchase of existing works or the erection of new ones. On the one hand, the essentially local character of a public authority gave it a decided advantage in the ownership of works, the local authority further had no necessity to earn a dividend, and could obtain loans at specially low rates of interest. On the other hand, local authorities were obliged to provide annually a sinking fund for their loans; also in purchasing a water undertaking, allowance had to be made for compulsory transfer beyond the standing value of the concern itself. The author considered that in matters of management a private company was more favourably situated than a local authority, at any rate, in the case of small towns. With regard to meter supplies as applied to small works, reference was made to Abingdon and Malvern, where that system had been carried out with success; but it was pointed out that in both cases there existed auxiliary supplies from private wells which were relied on for sanitary purposes. Under normal conditions the author considered the meter system very unsuitable to small works. The practice of fixing pumps in boreholes and thus avoiding the necessity for wells, while effecting a striking reduction in first cost, involved several disadvantages in working and effecting repairs, which tended to counteract the initial economy. The author next described some waterworks extensions carried out by his partner, the late Mr. Jabez Church, M.I.C.E., at Halstead, Essex. The cost of the work was just over £8,000, or £1 per head of the population. The author then described the construction of an impounding reservoir erected at Godalming by the late Mr. Church. Descriptions were given of works at Blandford, Dorset (designed by Mr. F. Beesley, M.I.C.E.), and at Fenny-Stratford (designed by Mr. J. Enson, M.I.C.E.), both having oil-engines as motive power. In the former case the cost was £1 17s. 6d. per head of population, and in the latter £1 3s. 4d. Two small works were referred to at Swanland, near Hull, and Sonning-on-Thames, both using oil-engines for pumping purposes. The cost of pumping in the former case was 1-49d. per 1,000 gallons lifted 300ft., not including labour, which represented approximately 1d. in addition, and 1-267d. per 1,000 gallons lifted 100ft., not including labour in the latter.

New Baptist Sunday-schools are about to be built in Mount Stuart-square, Cardiff, from plans by Messrs. J. P. Jones, Richards, and Bugden, of that town.

A new board school at Shieldfield, Newcastle-on-Tyne, was formally opened on Monday. It has been built by Messrs. Middlemiss Brothers, from designs by Messrs. Plummer and Barrett, of Newcastle. The clerk of works was Mr. W. Mather.

An inquiry was held at the corporation offices, Rawtenstall, on Wednesday week, before Col. J. T. Marsh, an inspector from the Local Government Board, to consider an application of the Rawtenstall Town Council for powers to borrow £4,000 for the construction of a fire-station, stables, workshops, and apparatus, and to purchase a steam fire-engine. The borough surveyor, Mr. H. A. Cabler, produced and explained the plans.

The jubilee of the erection of the parish church of Heeley, near Sheffield, is to be marked by the erection of a south aisle to seat 150 persons. In 1889 the church-room was built and furnished, at a cost of £500. In 1890 a new vestry was built, the parish church was lengthened by one bay, and a north aisle built, providing additional accommodation for 300 persons, at a cost £1,750, while three years later Sunday-school buildings were erected in Hartley-street, adjoining the churchyard, at a cost of £700.

The charge against James F. W. Dellow, late chairman of the board of guardians of St. George's-in-the-East, of receiving bribes from contractors for supplying articles to the board, was resumed on Monday at the Thames Police-court. The magistrate said he had resolved to commit the defendant for trial in one case—that of receiving £10 from Mr. William Gibbs, granite merchant. The inquiry into the other charges was adjourned.



## Our Office Table.

THE Dean of St. Paul's, as treasurer of the Cathedral Decoration Fund, appeals for funds for carrying forward the works now in progress in the choir from designs by Professor W. B. Richmond, R.A., and carried out by Messrs. Powell, of Whitefriars. The work has now been completed down to the cornice level, and the money in hand will about suffice to pay for that already executed. The lower portion of the choir now claims attention. Generous friends have undertaken the cost of filling 10 of the 12 spandrels with mosaic. There remain two more, and the decoration of the arches and pilasters in the choir. For this the committee require about £2,000 more than they now have. After this work has been completed there are the four half-domes at the corners of the great dome, with the blank spaces above them at the sides of the quarter galleries, and the drum of the dome, which urgently demand decoration. The cost of this will be considerable. Dr. Gregory adds: "It is very important for this work to be carried on whilst we have the inestimable advantage of an artist who has proved himself so competent to make the necessary designs; but to enable us to do this we must have the requisite funds."

In the Provincial Parliament of Ontario the Architects' Registration Amendment Bill has passed its second reading, and has been referred to a select committee of ten members. About four years ago, on the initiative of the Ontario Association of Architects, a Bill was passed by the Ontario Government for the protection of architects; but every advantage of the Bill, the pith and essence of its usefulness, was annulled, says a Transatlantic exchange, through the insertion by the legislators of the word "registered." The Bill provided that no one should have the right to call himself a "registered architect," unless he were duly qualified according to rules laid down in other clauses; but anyone was at liberty to call himself an "architect" and to practise as such, whether capable or not of carrying out the works committed to him. Still, the very fact that such a person was not a registered practitioner would, in the United Kingdom, at all events, judging by the analogous cases in the medical profession, greatly detract from his status and emoluments. The Ontario Association, however, is dissatisfied, and has, ever since the Act was passed, been organising and agitating to have the obnoxious word "registered" removed. The difficulty lay principally in the misunderstanding of the object of the measure; but it will be seen that the movement has this session considerable probability of success.

On Tuesday evening next, the 21st inst., Mr. Harry Hems, of Exeter, will read a paper, entitled "The Rood and other Church Screens of Devon, Past and Present," before the Society of Architects, St. James's Hall, Piccadilly, W., at 8 p.m. The lecture will be largely illustrated through the medium of the lantern, and by actual examples from Mr. Hems's own private architectural collection. The latter, as a museum of Mediæval oak-work of West Country type, is an exhaustive and carefully-arranged one, and has probably no rival as regards extent and variety amongst private collections.

The Lower Thames Navigation Commission appointed in November, 1894, to investigate and report upon the outer bar of the river Thames, have completed their report, which is in the hand of the Board of Trade and the Thames Conservators. After describing the locality and extent of the Leigh Middle Shoals, which constitute the bar, the commissioners (Mr. J. Wolfe Barry, C.B., chairman, Sir G. Nares, Mr. G. F. Lyster, and Mr. R. W. Peregrine Birch, Secretary) state that vessels drawing 25ft. of water and upwards are liable to have to wait, in order to pass the shoals, for periods varying from 3¼ to 5½ hours. This bar is at Yantlet Creek, 14 miles below Gravesend, and extends a distance of four miles. The commissioners recapitulate the programme of improvements at present contemplated by the Thames Conservancy and the views put before them by the representatives of the leading steamship lines, and express concurrence with the contention that much public advantage would be gained if a navigable depth of about 30ft. was afforded at least up to Gravesend. They recommend that the Yantlet Channel should be at once buoyed and made available for navigation, and that certain small shoal patches in the channel,

limiting its depth to 25ft., should be removed by dredging. They also recommend that a competent marine surveyor should be immediately and constantly employed by the conservators to sound and chart the Thames from the Nore upwards, and that the jurisdiction of the Thames Conservancy should be extended as far seaward as the Nore.

At a recent meeting of the Glasgow Corporation a letter was read from the Building Trades Exchange of that city protesting against the building operations of the Improvement Trust, but the Town Council decided to let the letter lie on the table. Mr. David Cook, secretary of the Building Exchange, has again written to the town clerk, asking when they might hope their letter would receive the consideration of the Corporation, as "in the event of the Corporation deciding to ignore their representations, it will be for the Exchange to consider whether they should take steps to have the legality of the Improvement Trustees' operations tested." The Exchange contend that the class of properties now being erected by the trustees is entirely different from that contemplated by the Improvement Acts.

The municipal council of Cork had, on Friday, under consideration what Mr. Justice O'Brien rightly stigmatised as the "ludicrous verdict" given at the recent assizes by a special jury of the city in the action of the corporation against Messrs. Fitzgerald and M'Mullen, the contractor and architect for the municipal buildings, and reported by us last week, p. 547. The subject was introduced by the law agent, who reported the result of the trial, and asked for instructions as to what further action the city council wished to take. The town clerk mentioned that the costs of the recent trial had been "enormous." The discussion which ensued was, for obvious reasons, conducted in the absence of the Press. Following a protracted and heated discussion, it was decided by a majority of two to one (26 to 13) to ask the Court of Appeal to assess reasonable damages upon the findings of the jury, and in the event of their refusing to do so, to apply for a new trial. Should the case be reheard, it will be desirable to change the venue from Cork to some other assize town.

The current issue of *Indian Engineering* describes and illustrates by diagrams the apparently successful efforts which have been made by Mr. K. C. Banerji, B.A., S.A., C.E., of the Public Works Department, Bengal, to overcome the acoustic defects in the Senate House of Calcutta University by means of a specially-designed paraboloid sound reflector. The hall of the senate house is 133ft. by 58ft., with verandahs on all sides and a flat terraced roof. The dais was originally located in the centre of the hall, when so poor were the acoustic properties of the hall that the speeches delivered were only audible to a few who chanced to sit in front of the speaker, the rest of the audience only hearing a confused sound which was the combined effect of reflections and counter-reflections from the smooth walls all round and the boarded ceiling above. Several attempts had been previously made to minimise the reverberations of sound thus caused by erecting iron wires across the hall, which are still in existence, but with no appreciable effect. A committee consisting of Professors Pedler and Gilliland and Mr. Banerji removed the dais to the west end of hall, and decided to place over it a parabolic reflector, consisting of an iron framing inclosing an air space between two layers of tin sheeting. The surface of the reflector is formed by the revolution of a parabola about its axis. The frame of the reflector consists of vertical L-iron ribs, and an L-iron rib on the plane traversing the axis, and inclined at 5° to the horizon. The lower portion of the paraboloid is strengthened by vertical as well as curved L-iron stays, fixed to the floor. The whole structure is kept in its place by wrought-iron ties, formed of rods, plates, and wire ropes fixed to the several walls. The front concave surface of the reflector is made of thin teakwood planks screwed on to battens which are fixed to the iron frame. The back of the reflector is formed of tin sheets, so as to inclose between them an air space for purposes of vibration. The front surface has been made parabolic and painted over.

A SPECIAL meeting of the Cheshire County Council was held at Chester Castle on Friday for the purpose of considering the report of the special committee on the appointment of a county architect and surveyor, in succession to the late Mr. Stanhope Bull. In their report, the com-

mittee proposed an entire separation between the offices of county surveyor and bridgemaster and county architect. They recommended the appointment of a county surveyor and bridgemaster, to superintend and be responsible for the maintenance, repair, and improvement of the rural main roads; to receive from the several urban authorities in the county the detailed estimates for the works proposed to be carried out by them each year, and to summarise them for the information of the main roads committee, and to advise such committee thereon; and to visit and inspect all the county bridges, bridge approaches, and fences at least once in every year. The salary the committee fixed at £500 per annum with travelling expenses, and £250 for assistance in performing the duties of the office. They also recommended the appointment of a county architect to visit and inspect police stations, magistrates' rooms, county asylums, courts and county buildings, and make periodical reports and prepare plans and specifications when required. The committee recommended a salary to the architect of £200 with travelling expenses, and a commission of 5 per cent. upon the contract price of all new works carried out. Several alterations were made in the report, the chief of which were that, in reference to the surveyor, the council should appoint his assistant, and that with regard to the architect's remuneration, commission should only be paid upon works costing over £500, and then only at the rate of 4 per cent. The allowance for clerical assistance was also cut down from £250 to £200 a year. The report of the committee as amended was then adopted; and it was resolved that the main roads committee be instructed to advertise for a surveyor, and select five names for submission to the council, and similar instructions were given to the special committee as to the appointment of a county architect.

THE annual conference of the Amalgamated Union of Upholsterers was concluded on Friday at the Victoria Hotel, John Bright-street, Birmingham, under the presidency of Mr. A. McKee, of Belfast. The revision of the rules was completed, and then the delegates elected the officers for the ensuing year. Mr. McKee was reappointed president, Mr. A. Muggoch, of Glasgow, was elected treasurer, Messrs. C. Whitehouse, of Birmingham, R. Tisdall, of Dublin, and W. Turner, of Aberdeen, were appointed trustees, and Mr. S. Beckley was elected secretary.

PROF. JOHN MILNE, the well-known seismologist, delivered a lecture in Manchester last week on the "Unfelt Movements of the Earth's Crust," in the course of which he showed that surface movements of an active kind were actually taking place at the moment in the city of Manchester. Those vibrations were reflected in the motion of a spot of light thrown on the wall by the apparatus, which in this form reproduced all the unfelt movements of the earth's crust within a radius of two miles. The lecturer expressed some surprise at the activity of movement betrayed by the instrument, but explained that the minute elastic tremors to which it was due were chiefly produced by artificial causes, such as traffic in the streets and on the railways, the stamping of people in the theatres, or the dancing of performers on the stage, or of couples in the ball-room. Together with those causes, however, natural agencies were also constantly at work and producing a like effect. Mr. Milne went on to describe the circular movements of the earth's crust, and showed how these had resulted in the bulging up of our continents and the formation of mountain chains. As the ground moved upwards from beneath the waters, he said, the waters themselves must have subsided. He suggested, indeed, that at least 25 per cent. of what was usually regarded as elevation above the sea-level was probably due to the falling of the waters. If one looked at a physical map of the world, and observed how much of the land areas did not exceed 300ft. in elevation, he would see for himself that, inasmuch as that extent of surface might have been exposed by recession of the ocean, bradyseismical action had possibly not played such a great part in the evolution of geography as it was usually supposed to have done. Commenting on the rarity of serious earthquakes in this country, Prof. Milne pointed out that the last time Manchester was visited by a disturbance of the kind was on Sept. 14, 1777, when more or less destruction was caused.

On Easter-day last the long desecrated and mutilated font of the parish church of Wirk-



worth, Derbyshire, was used again, probably for the first time for two centuries. The old bowl, which seem to correspond with the date of the earlier portions of the church—viz., early 13th century—has been knocked about very much, and put to a variety of purposes, amongst others for mixing colour-wash when the interior of the building was distempered some years ago. The font was probably removed during the Commonwealth, as the one till recently in use is dated 1662 (see Cox's "Churches of Derbyshire"). The stone is a porous limestone, somewhat like tufa or pumice-stone, and is very light. It has the colour and appearance of grit-stone, and is the stone largely used in the building of the church during the 13th century. Mr. John Simpson, of the Hopton Wood Stone Company, has restored the font, and added a base of four columns grouped round a central shaft, in very suitable character, and resting on a plinth of Hopton Wood stone. The columns are of the same material as the ancient bowl. The work, judging from a fine photograph, has been admirably done, and has received, we understand, the approval of the Derbyshire Archaeological Association. The restoration was carried out as a memorial to the late vicar, and the base bears the following inscription:—"This ancient font was restored Anno Domini 1876 + in memory of the late + Thomas Tunstall Smith +."

### MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (TO-MORROW).—**Royal Institution. "The Paintings of the Sistine Chapel," by Professor W. B. Richmond, R.A. 3 p.m.

Northern Architectural Association. Visit to Trinity House and All Saints' Church. Meet at Quayside 3 p.m.

**MONDAY.**—Royal Institute of British Architects. "The Architect's Use of Colour," by Halsey R. Ricardo and Christopher Whall. 8 p.m.

Society of Arts. "Precious Stones," by Professor Henry A. Miers, M.A. Cantor lecture No. 2. 8 p.m.

**TUESDAY.**—Society of Architects. "Devonshire Rood Screens," by Harry Hems, of Exeter. 8 p.m.

**WEDNESDAY.**—Society of Arts. "The Perfected Photo-chromosome and its Colour Photographs," by F. E. Ives. 8 p.m.

Carpenters' Hall Free Lectures. "Timber Roofs," by Professor Banister Fletcher. 8 p.m.

**THURSDAY.**—Society of Arts. "The Deserted City of Vijayanagar," by Capt. Charles Rolleston. 8.30 p.m.

**FRIDAY.**—Architectural Association. "The Present Position of Architecture at the Royal Academy," by Francis E. Masey. 7.30 p.m.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE SIXTH ORDINARY MEETING of the Society of Architects for the Session 1895-6 will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on TUESDAY, APRIL 21st, 1896, at Eight o'clock p.m., when a paper will be read by Mr. HARRY HEMS, Associate, entitled "DEVONSHIRE ROOD-SCREENS: PAST AND PRESENT," and illustrated by Limelight Views.

ELLIS MARSLAND, Hon. Sec.

For some time past Mr. Melvin, the manager of Glasgow sewage works, has been experimenting with the sludge resulting from the purifying of the city sewage, and he now claims to have found that it contains a valuable proportion of enriching qualities for agricultural purposes. Offers have already been made by leading firms of from 10s. to about 20s. per ton for the sludge at present going to waste, and it is hoped that the sale of the sludge for field manure will yield a good revenue.

The Leeds City Council, on Monday, considered the proposed reconstruction of the Kirkgate markets. A scheme, prepared by Mr. Thomas Hewson, the city engineer, was submitted by the markets committee, necessitating an estimated outlay of £48,477; but some exception was taken to the proposals, and an amendment, referring the whole matter back to the committee, was adopted. Tenders amounting to £28,135 0s. 11d. were accepted for works connected with the erection of a fever hospital at Manston.

The Quinton Cycle Company have on hand building operations which will result in the doubling of the capacity of their works at Coventry. The portion being first undertaken is the extension of the offices, stores, and stock-rooms to the front of the present works, the builder being Mr. T. G. Golby, of Earlsdon. The plans for the enlargement of the workshops are not yet completed, but it is intended to provide accommodation for an additional 200 men, the number at present employed being about 280. A new 20 H.P. gas-engine is also being laid down.

## Trade News.

### WAGES MOVEMENTS.

**ACCRINGTON.**—It has been mutually agreed between the employers and the carpenters and joiners that on and after May 1st next wages shall be advanced from 7½d. to 8d. per hour, and a reduction of one hour per week in the working time, making 53 in the summer and 43 in the winter.

**ARBROATH.**—A conference took place on Monday night between the Arbroath master joiners and representatives of the operatives, who had been on strike since Wednesday in last week. The masters agreed to concede the demands of the men, which were an advance of wages from 7d. to 7½d. per hour, a nine hours day for nine months of the year, and an eight hours day for the remaining three months of the year. All overtime to be paid at the rate of time and a quarter. Work has been resumed.

**BLACKPOOL.**—A new code of rules has been signed, which concedes in the building trades an advance of ½d. per hour, and a reduction of 5½ hours per week during the winter-time, with increased rates for overtime.

**DUNDEE.**—On Saturday afternoon representatives from the Dundee joiners on strike had a conference with several members of the Masters' Association, when the chairman of the Association signed the men's circular on behalf of all the firms connected with the Masters' Association, thereby conceding all the demands made by the men. The strike is, therefore, now practically at an end.

**EDINBURGH AND LEITH.**—A general meeting of Edinburgh and Leith glaziers was held in the Moulders' Hall, Edinburgh, on Saturday afternoon, to consider the attitude of the employers who have not replied to the request for an increase of wages from 7½d. to 8d. per hour. Favourable reports were given by employes present, who stated that since the men ceased work on the 11th inst. the masters (with one exception in Leith) had conceded the advance.

**HUDDERSFIELD.**—The master builders of Huddersfield met representatives of the Labourers' Union on Friday night, and as a result an amicable settlement was arrived at in the dispute which caused the men to come out on strike on the evening of Good Friday. The labourers originally demanded an advance of wages from 5d. to 6d. per hour. The men, over 270 in all, resumed work on Monday. The masters originally offered an immediate advance of ½d., and an extra ½d. in three months. On October 12th the carpenters and joiners of Huddersfield gave a six months' notice that they would leave their work unless the masters agreed to advance the standard rate of wages from 7d. to 8d. per hour for a 49½ hours', instead of a 50 hours' week, and also to alter the rules between master and man, so as to allow the men to give three months' notice in case of a strike. After this the masters gave a counter-notice that the working week should be lowered to 44 hours during the six weeks before and the six weeks after Christmas. Negotiations failed to settle the dispute, and the men came out on strike.

**KILMARNOCK.**—The master joiners of Kilmarnock have intimated to their employes their willingness to concede the demand for an advance of ½d. per hour on the present rate of wages.

**NEWRY.**—The master builders of Newry have granted an increase of wages to the masons and bricklayers to the extent of 1s. 3d. per week, and 2s. extra when they are employed at country work. The men have asked for an increase of 2s. per week.

**NORTH-WEST CHESHIRE.**—At Ashton-under-Lyne, Stalybridge, Hyde, and Denton joiners have secured a reduction in the working time of one hour per week, which will bring them down to 53½, and also an advance of a halfpenny per hour. They have also taken in hand the apprenticeship question, and propose there should be one apprentice to every four journeymen, and that no shop should have no more than three, no matter how many men were employed. The matter has been compromised by an agreement with the employers to allow one apprentice to every three journeymen, and seven apprentices to one shop, providing there are 21 journeymen or more employed.

**NOTTINGHAM.**—Although the point in dispute between the master stonemasons of Nottingham and the operatives appears to be but a simple one, there is little prospect of a speedy termination of the strike. Hitherto the wages have been 9d. per hour, and the workmen demanded 9½d. They also ask that work shall cease on Saturday at 12 noon, instead of 12.30; they ask that in future no employer shall have more than one apprentice with six masons. The men have withdrawn their application for an advance of wages, and the only point now in dispute is that of the limitation of apprentices.

**THE POTTERIES.**—In reply to a request from the joint meeting of North Staffordshire builders, operative bricklayers, and labourers, the Board of

Trade has requested Sir William Markby to act as umpire in their dispute. Sir William, having consented, will probably visit the Potteries on Monday week, the 27th inst., for the purpose of hearing the matter in dispute argued on both sides. The bricklayers request an advance from 8d. to 9d., and the labourers from 5d. to 6d.

**UDDINGSTON.**—The joiners employed in Uddingston struck work on Monday for an advance of ½d. per hour. The present rate in Uddingston is 8d., and in Glasgow 9d. per hour.

### CHIPS.

The ancient and picturesque parish church of Caerwys, Flintshire, was on Wednesday week reopened, after undergoing what has practically amounted to rebuilding.

The town council of Ayr unanimously adopted on Monday a report by a committee recommending that the corporation should construct a line of tramways from Burns' Monument to Prestwick through Ayr, a distance of six miles, and that the motive power should be electricity, generated at the Electric Lighting Works.

At the meeting of the Liverpool Architectural Society, held on Monday night at the Law Library in that city, Mr. Thomas L. Miller, A.M.Inst.C.E., read a paper on "The Application of Electricity to Lighting and Power Purposes."

The South-Eastern Railway Company's works at Folkestone Harbour are to be pushed ahead as fast as possible. Mr. Francis Brady, who has so long been the chief engineer of the South-Eastern, retires from active service with the rank of consulting engineer, and is succeeded by Mr. Tempest. The harbour works are to be executed by a large firm of contractors.

At the quarterly meeting of Perth District Committee of the Perthshire County Council on Monday, it was agreed to form a water supply district for the village of Errol (the scheme to cost £4,020), and a drainage district for Stanley.

We understand that Mr. C. J. Phipps, F.S.A., has taken into partnership Mr. Arthur Blomfield Jackson, A.R.I.B.A., one of the surveyors of the diocese of St. Alban's.

The new board schools in Green-lane, Leeds, were opened on Monday. The structure, which has been built from designs prepared by Mr. W. S. Braithwaite, architect, of South-parade, Leeds, is in the Late Tudor-Gothic style, built of red brick relieved with stone dressings. It is intended for junior boys and girls. Its frontage is 238ft., and it extends back 37ft. Erected on the corridor principle, it will accommodate 630 children, exclusive of 80 senior boys, for whom a large manual instruction-room has been provided. The Green-lane School buildings, with the playground attached, now form a quadrangle 8,000 square yards in extent, and the various departments provide accommodation for 2,110 children.

The reconstruction of the Worcester Cathedral organ is now making rapid progress. Upwards of £1,900 has already been contributed, but £400 are still needed to finish the work. The opening has been fixed for Tuesday, July 28.

The town council of Harrogate elected on Tuesday, as manager of the baths and wells, Mr. Bennett, who has been the clerk of works during the erection of the baths. There were 135 candidates, and Mr. Bennett was chosen by 14 votes to 3.

Extensive additions are being made to the North Riding Infirmary at Middlesbrough, from the designs and under the superintendence of Mr. R. Loft-house, diocesan surveyor, and Mr. T. A. Lofthouse, A.R.I.B.A., of that town.

The new school buildings which have been erected by the Brewers' Company under Lady Owen's Trust were opened at Owen-street, Islington, on Tuesday. The schools, which were erected in 1840, were enlarged in 1881 for 300 boys, and will now accommodate 400 day boys. The present outlay has been £30,000. In addition to new classrooms and masters' rooms, there are physical and chemical laboratories for the teaching of practical science, and a lecture-room which will accommodate about 150 boys. A girls' school is also connected with the foundation.

A gale on Sunday blew down some 12ft. of the fine spire of the parish church at Lydney, Gloucestershire. The debris fell on the roof of the church, smashing one-third of it in, as well as the beams and wheels in the ringing chamber. A stained-glass window and a memorial tablet were destroyed. The damage is estimated at £600. The parishioners have lost no time in repairing the mischief, for, at a meeting held this week, it was agreed to accept the tender of Mr. James Rees, of Birmingham, for taking down the portions of the spire which are dangerous, and rebuilding the whole, while he is to send in further estimates for repairing the roof of nave



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**TENDERS.**

\* \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**ANGLESEY.**—For extending the jetty on the county Anglesey landing-stage of the ferry, for the Bangor City Council:—

Thorne (accepted) ... £240 0 0

**AVE.**—For carrying out contract No. 1 of works of sewerage, for the town council, from plans by the burgh surveyor:—

Crawford, T., and Son, Wishaw ... £3,348 5 8

(Accepted.)

**BANGOR.**—For building on the pier now in course of erection four kiosks, two circular wind screens, and two 20ft. straight wind screens, for the Bangor City Council. Mr. J. J. Webster, C.E., engineer:—

Thorne (accepted) ... £973 5 0

**BURTON-ON-TRENT.**—For alterations to premises, for the town council:—

Varlow (accepted) ... £8,439 0 0

(Lowest of eleven tenders received.)

**CAPEL, KENT.**—For alterations to the Capel Isolation Hospital, for the Tonbridge Rural District Council:—

Fenn, G. and F., Pembury (accepted) £196 17 0

**EASTHAMPTON.**—For new infirmary and other works, for the Easthamptead District Council. Messrs. Charles Smith and Son, Reading, architects. Quantities by Messrs. Henry Cooper and Sons, Reading:—

	A.	B.	C.	D.	E.
Walden and Cox ...	£6,850 4 10	£82 17 2	£168 3 1	£301 9 3	£7,402 14 2
Pilgrim, T. ...	5,950 0 0	83 0 0	400 0 0	375 0 0	6,808 0 0
Clements, C. ...	5,199 0 0	60 0 0	140 0 0	279 0 0	6,678 0 0
Stokes ...	5,884 0 0	63 0 0	387 10 0	320 0 0	6,654 10 0
Norris and Son ...	5,790 0 0	59 0 0	142 0 0	284 0 0	6,275 0 0
Kinglerie, T. H. ...	5,790 0 0	56 0 0	148 0 0	260 0 0	6,254 0 0
Watson ...	5,690 0 0	66 0 0	125 0 0	263 0 0	6,144 0 0
Margetts, J. H. ...	5,498 0 0	57 0 0	141 0 0	248 0 0	5,944 0 0
Simonds, G. ...	5,400 0 0	74 0 0	160 0 0	270 0 0	5,904 0 0
Higgs and Sons ...	5,390 0 0	79 0 0	161 0 0	279 0 0	5,899 0 0
Tucker ...	5,351 0 0	54 0 0	149 0 0	262 0 0	5,816 0 0
Hawkins, W. ...	5,305 0 0	52 0 0	180 0 0	279 0 0	5,766 0 0
Wernham, G. ...	5,210 0 0	89 0 0	182 0 0	265 0 0	5,736 0 0
Lewis Bros. ...	5,250 0 0	56 0 0	138 0 0	250 0 0	5,694 0 0
Collier and Catley ...	5,190 0 0	49 0 0	129 0 0	257 0 0	5,625 0 0
Bottrell and Son ...	5,198 0 0	60 0 0	126 0 0	235 0 0	5,618 0 0
Fitt, M. C. ...	5,195 0 0	58 0 0	126 0 0	233 0 0	5,612 0 0
Hughes ...	5,177 18 9	52 4 4	118 12 8	221 11 6	5,570 7 3
May, W. J. ...	5,116 0 0	56 0 0	125 0 0	237 0 0	5,534 0 0
Taylor, D. ...	5,000 10 0	69 0 0	162 6 0	265 0 0	5,496 16 0

A.—Infirmary.

B.—Extra if Balconies.

C.—Extra for additional nurses' rooms.

D.—Additions to porter's Lodge. E.—Total.

**COLERAINE.**—For extending sewerage mains in Upper Captain-street, for the town commissioners:—

Williamson, J. A., Coleraine (accepted).

**COVENTRY.**—For the construction of a new street from Queen's-road to Starley-road, for the city council:—

Executors of Boon, W. ... £146 17 0

Burnham, H. ... 110 0 0

Hall, W. T. (accepted) ... 135 0 0

(City surveyor's estimate, £147 10s. 6d.)

**CROYDON.**—For the erection of a residence, Heathfield-road. Mr. Richard Peters, 73, Wool Exchange, Coleman-street, E.C., architect:—

Richardson Bros. ... £778 0 0

Winburn ... 750 0 0

Bullock (accepted) ... 680 0 0

**DYFFRYN.**—For Baptist chapel, Dyffryn, Merionethshire. Messrs. Owen Morris Roberts and Son, Portmadoc, Carnarvonshire, architects:—

Thomas, Parry, and Co., Llanbedr (accepted) £400

(Lowest of five tenders.)

**EAST COWES.**—For the erection of a town hall, East Cowes, Isle of Wight. Mr. Jas. Newman, Sandown, architect:—

Brading, W. H., and Son (accepted) £1,900 0 0

**EDINBURGH.**—For cabling the tramway lines, for the corporation:—

Dick, Kerr, and Co. (accepted) ... £189,720 18 7

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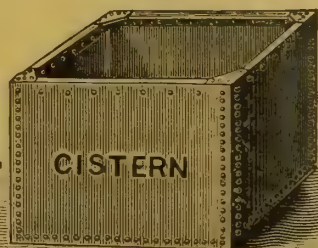
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## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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## QUANTITIES AND CONTRACTS.

THE conditions of contract that will please everybody—contractors, employers, architects, surveyors, arbitrators, lawyers, and experts—still remain to be written. It is not for want of trying if they have not already been prepared. But unfortunately the very suggestions which seem most admirable to some of these classes are just those which other classes find most objectionable. Employers and architects, for instance, would infinitely prefer conditions which would prevent disputes. Contractors probably would be of the same mind if contracts always yielded a fair profit; but with competition at its present pitch, it is notorious that they often end in a loss, and then a dispute offers the best chance of turning the loss into a profit. Surveyors perhaps have no strong interest either way. Still, disputed accounts do involve measuring and valuing, and so bring in work, if not work of the most agreeable kind. Lawyers, according to the old adage, live by quarrels; arbitrators are not needed while perfect peace prevails, and experts would find little to do if all contracts were wound up quietly. These last classes, therefore, as good citizens, may desire to behold that perfect set of "conditions" which will usher in the millennium of the building trades; but as private individuals it can hardly distress them much if they die without the sight.

It might seem that little remained to be said on this subject, that all the classes concerned had stated their views, and that it was not want of discussion, but difference of interest, which prevented a general agreement. But two or three points—not new perhaps, yet comparatively neglected—turned up in the discussion the other night at the Surveyors' Institution. Should the bills of quantities form part of the contract? Should the quantity surveyor ascertain the amount of work done from time to time, and give all the certificates but the final one? Should the architect be the arbitrator under the contract? These are very important questions, and they deserve more consideration than they have generally received. To-day we can only deal with the first of them.

To the mere theorist, with no knowledge of the way in which the system actually works, it is likely to seem right and proper that a contract should always be based on the quantities. The builder, he would say, trusts to them and tenders on them. He rarely reads the specification before his estimate goes in, and very often he does not even look at the drawings. If he did look at them, he could not tell, without days or weeks of very careful work, what it would cost him in materials and labour to carry them out, so that he must either accept the quantities, or tender by guess after merely cubing up the contents. As a matter of fact, the theorist might add, the contract is based on the quantities, and seeing that it is so in reality, why should it not be so avowedly? Here we must go a step further back, and ask how the quantities originated. There are three ways in which bills of quantities are accustomed to originate. In London they are commonly prepared by a quantity surveyor, appointed by the employer or his agent. In the country they are commonly prepared by the architect. But it sometimes happens that the employer, being penny-wise and pound-foolish, thinks he will save by supplying no quantities at all. Then the contractors who are invited, if they have

their wits about them, and if the building is of sufficient importance, meet and appoint a quantity surveyor of their own. In this last case, which is an exceptional one, perhaps the theorist himself would hardly consider that the contract ought to be based on the bills. In the other two cases he would have little doubt about it. But experience shows that there is a great difference between these two. In one of them the system works well, and prevents disputes; in the other, it may lead to enormous claims, and to a general fight all round.

When the London architect does not take out quantities, it generally happens that he does not know how. Of course, he may know how, and yet may have so much purely architectural work in hand that he has no time for it. In that case, he will naturally follow the higher and pleasanter occupation, and be an architect rather than a surveyor. But if he has the time, and has had the training to be both, it is difficult to see why he should let that training be wasted. Most decidedly we advise no architect to set up as a quantity surveyor unless he has had a quantity surveyor's education. There are many architects, however, brought up for the most part in country offices, who have had it, and who add to ability for design and knowledge of construction an acquaintance with the comparatively easy art of measuring up the things constructed. Kind friends—not wholly disinterested—counsel them to forget it. Gentlemen who know nothing of art, and care nothing for it, warn those who do know and care, that to "take out" the brickwork in a cottage, or to ascertain how much stone and labour there are in a turret, will ruin their artistic faculties for ever. We wonder if any of them believe it. At any rate, in the North of England, members of our profession who do far better work than is common in the Metropolis, take out their own quantities, and neither feel ashamed of it, nor find their artistic faculties enfeebled by it. No other architect understands all the ins and outs of the building he has just designed half so thoroughly as the one who has also measured it up himself. No other architect knows half as clearly when he is in danger of exceeding the contract as the work goes on, and of giving unintentional orders for extras. No other architect is so certain to detect and rectify before the contract is signed every error or omission in his drawings and specification. No other architect can decide with half the certainty, when the work is completed, which of the builder's claims are justifiable and which are not. He alone has all the facts within his personal knowledge, and does not need to ask another man, "What did you take here?" and "What did you allow for there?" He alone, too, has looked at the work in its minutest detail, from the builder's point of view as well as the employer's. He has realised how much labour there is in items which other architects would dismiss as trifling; and if he is an honourable man, and wishes, as most architects wish, to deal fairly with all parties, he has exceptional opportunities of knowing what fairness is.

It matters little, in such a case, whether the quantities are or are not the basis of the contract. But as matters remain as yet, anybody, honourable or not, may call himself an architect. A dishonourable pretender to the name, therefore, might, by purposely supplying "short" quantities, do damage to a contractor. This is the only risk, and there is a complete safeguard against it—namely, to make the architect's quantities the basis of the contract. Then any deficiencies in them can be claimed for as extras, and the builder cannot lose by them. There is no likelihood that the architect's quantities will be largely in excess, to the employer's detriment, though if they were, he would have the same power of rectifying matters in this sense as the contractor has in the opposite one. But the

architect, on the one hand, is nearly always anxious that tenders shall not be excessively high, lest his own estimate be exceeded; and, on the other hand, he is equally desirous of avoiding claims on account of his omissions in the measurements, so that he is as favourably placed as anyone can be for doing perfect justice, and aiming at strict accuracy.

The outside quantity surveyor is, no doubt, just as fair and honest in attention, but he is differently placed. He has never made himself responsible to the employer for getting the building done at a specified price. It matters nothing to him, therefore, that the lowest tender is £100 or £1,000 more than the architect predicted it would be. However high it is, nobody will blame the surveyor, and with a quiet conscience he will pocket his commission on the excess. Now, if his quantities are "short," the builder will soon inform him; but if by any chance they err in the opposite direction, he will never know of it, unless he finds it out himself, for his architect is, of course, one of those to whom quantities are a mystery, and who, therefore, has no means of knowing whether they are short or full. The surveyor will not consciously depart from the path of accuracy. But when a man is being persistently pulled in one direction, and when there is nothing but his own desire for uprightness to keep him from going over, he must be exceptionally rigid if he does not ultimately lean that way. He will not be aware, perhaps, that he leans at all; but contractors, who have the best means of judging, evidently believe that he does, for their partiality to surveyors' quantities is no secret. One fact like this is worth volumes of argument.

So far, we have been considering the way in which the architect's and the surveyor's quantities, respectively, may affect the original tenders. But it is even more important to observe how they are likely to affect the final accounts. The building has been completed, and it only remains to agree about the extras and omissions. It is the architect's business to say what these are. If he took out his own quantities, he knows them intimately, and as these quantities form the basis of the contract, the question can be settled at once. He has a thorough grasp of the facts. The contractor claims, say, at one point, for 1ft. 11in. wall instead of a 1ft. 6in. wall. Further on, he asks to be paid for a four-light window instead of a two-light one; while inside he makes a demand because the quarry owner charged him for 200 cube feet of stone in columns, beyond that which the mason's bill provided. The architect meets him, and produces his original measurements. "You are right as to the 1ft. 11in. wall. The additional thickness is an extra; but the wall was taken 20ft. high, and is only built 19ft., so that some alteration is required there in your amount. Your claim for the four-light window is correct. But as to the 200 cube feet of stone, none has been used beyond what the quantities describe. Here are my original dimensions, and here are the working drawings. Compare them for yourself, and see if you can point out an error." The builder examines them carefully, and gives it up; and at last, perhaps, it comes into his memory, or into that of someone who was on the works, that several large blocks were split up by frost, and that some other masonry was injured in carriage by railway. So matters settle themselves, and the whole affair ends quietly and peaceably.

The architect who has based a contract on the surveyor's quantities is in a much more helpless case. He receives the builder's claim, and sends for the surveyor. That gentleman, perhaps, is none too ready to produce his detailed dimensions. He stands on his dignity: he ought not to be asked for them—if he allows the architect to see them, it will only be as a personal favour, and no copy of them must be taken. The only



proper way of dealing with the builder's claim, he thinks, will be to measure up the whole building as it stands, and to allow as extra whatever excess it shows over the quantities on which the builder tendered. The builder, of course, has no objection. The measuring goes on. Everyone who understands these things knows how natural it is to measure items more in detail when they have actually been executed, than when they were only drawn or specified. There may not have been the smallest deviation from the drawings, or the slightest addition in labour or materials; but somehow or other the surveyor, when the thing is actually before his eyes, puts down a great many "small labours" which did not appear in his lithographed bills. Here and there, perhaps, the builder, to please himself, worked in some materials of a better kind than the contract required. He had some spare stone on the site, and to save taking it away, he put it in instead of brick; or he had some pitch-pine joists in stock, and inserted them instead of deal. Nobody ordered these things, or wanted them; but the surveyor measures them, and allows for their supposed value. So he does with the mistakes that were made as the work went on. The foreman, not being quite clear as to the distance of the ground floor above the ground, and being too careless to send a telegram, a letter, or even a post-card about it to the architect, settled the matter to his own satisfaction by keeping it a foot higher up than it ought to have been. This, with all that results from it—extra walling, extra facing, extra steps at every doorway—is another thing that the surveyor awards to the contractor, as he likewise does the results of every other blunder that happened from first to last.

The final effect is that, though the building was carried out with hardly an authorised departure from the contract, an enormous bill comes in. If the architect declines to pass it, the cry is, "Your own surveyor has prepared it. You appointed him yourself, and now you have got his award, it will not do for you to dispute it." If he still holds out, he has to fight the builder and the surveyor both. So has the employer, if it goes to arbitration, and his temper is not sweetened by receiving from the surveyor, who has put him in that position, a statement as to his commission for measuring extras and variations. As for the architect, he is simply ruined, so far as the prospect of further work from that quarter is concerned. His misdeeds are supposed to have produced the whole calamity, though all the wrong he really did was to allow the contract to be based on a surveyor's quantities.

This is no fancy picture. It is a record of never-to-be-forgotten facts, and we are glad, in consequence, to find that the prevalent feeling in the late discussion at the Surveyors' Institution was opposed to the making of surveyors' quantities the foundation of the contract. Their profession does a large amount of useful work, and as matters stand, is an indispensable one, especially in London and some other large towns. It is only natural that the surveyor should be as ready to do unlimited surveying, as the lawyer is to conduct unlimited lawsuits, or the architect to make unlimited sets of designs. But whatever brings about the wholesale remeasurement of buildings which have practically been carried out almost according to contract, is found, at least in England, to be an unmitigated evil, and this, or something much like it, is a common result of basing the agreement on a surveyor's quantities. At Glasgow, apparently, the system succeeds. There is a great deal in habit and custom; and there, perhaps, it is not the custom to take an unfair advantage of it. In the South there is no such unwritten law, no such honourable under-

standing; and until there is, the less we have to do with the system, the better both for architects and employers.

#### OVERLAPPING.

PROFESSIONAL men, as well as those who have acquired particular trades, resent anything like interference by others of different vocations. Notwithstanding the large amateur element—people who will persist in making their own designs—the architect's vocation is sufficiently distinct and circumscribed to be intolerant of builders, house agents, or even surveyors undertaking any part in it. That architectural work is often intrusted to these persons is probably no fault of the architect—others have to bear the consequences; but interference is looked upon with some degree of irritation, if not jealousy, as an encroachment or trespass on the domain of the rightful occupant. Frequently a builder undertakes to make plans as well as to contract for the work. He does not think he is doing anything wrong; he is a practical builder, and he has the idea, at least, that he is competent to draw out the requirements of the employer, overlooking the fact that making a design is a special vocation which is now practised by the architect. Such an encroachment on the ground of another is certainly "overlapping" of an objectionable sort. Or take the surveyor: he often prepares designs or makes plans, sections, and elevations for buildings, in addition to his other and legitimate business of making valuations, of arbitrating, estimating work and repairs, and taking out quantities. This intrusion becomes less objectionable when the building is of a kind in which no architectural or artistic skill is required; but the architect regards it as a trespass. No doubt, on the other side, it is considered overreaching for an architect to take out quantities for works other than his own—for him to make valuations of properties for mortgages and other purposes—to assess dilapidations and fixtures—transactions which are certainly not architectural. No doubt it would be impossible to lay down strict limitations where two professional duties so often overlap as those of architect and surveyor. In the course of his professional duties, the architect is called upon to transact business which is strictly not within his domain; to negotiate for terms and leases, make preliminary surveys, report on easements of light and support, obtain estimates and write agreements, draw up contracts, give advice on legal points, and transact other business which rightly belong to the estate agent, surveyor, or lawyer. And in these matters it would entail expense and cause delay to consult other professional men; he knows exactly what he wants, and goes a quicker way about it than if he were to refer to other individuals. On the other hand, he may make mistakes; his legal knowledge may fail him, and he may serve his client worse than if outsiders were consulted. The danger and disadvantage of this sort of professional overlapping may be stated as not merely doing work which others can do better, but in lowering the standard of work.

To the building trades we must turn mainly to discover the evil effects of the system of "overlapping," which is so extensively practised. There is scarcely a trade that has not suffered by the practice, and a strong feeling against it is felt among workmen, especially in trades like those of the bricklayer, plasterer, tiler, and slater. Complaints are becoming more frequent of trades losing their distinctive lines of demarcation. Some of the trades are, owing to the pernicious effects of competition, becoming associated with other callings, as in the cases of the plumber, the painter, and gasfitter. We can explain how this gradual absorption has taken place. A contract is undertaken

by Mr. Grabber for all the work at a very low price; he cannot afford to employ skilled tradesmen in every branch of the work. The bricklayer is willing to do the plastering and the indoor tilework and to tile the roof; the plumber undertakes to do all the sanitary work, the gasfitting, and glazing; the decorators do both painting and decorating, and by such an amalgamation of the trades the work is done at a much less cost than it otherwise would be. The demand for these combinations of trades is greater than ever, and to the "jerry"-builder we must attribute the breaking down of those barriers of separation which were religiously observed in the last generation. But barrier-removal is one of the distinguishing characteristics of our time. Even the draper and the tailor and the grocer have entered into new compacts, under the euphemistic title of "emporiums" and Civil Service stores, and therefore we must not be surprised if the building trades follow the example. The results will be disastrous for arts and craftsmanship of all kinds. Already the evil is beginning to be felt by the public and the trades themselves. It will be difficult, for instance, for a man to know whether he can get a better coat at the wholesale store or at his tailor's, or whether a lady can get a more stylish dress made at the great West-end establishment or at the costumier's, so much is now a matter of capital and management. The great furniture mart, again, seriously interferes with the makers of high-class goods, whether in the purchase of ordinary drawing-room suites or in carpets and hangings. Wholesale overlapping goes on unchecked in the production of these goods, for the public are not critical enough to discern the difference between the work of specially-trained artists and the makers of "slop" wares. Take, for instance, furniture or brasswork. The designs we see in the market are devoid of those qualities which distinguish the real craftsman from the wholesale manufacturer who takes on copyists of old work, and men who have never learned the trade.

The question is beginning to arouse opposition in some quarters. At a recent meeting of the Belfast United Trades Council, the question was discussed of which trade was entitled to do pile-driving. The shipwrights complain that carpenters and joiners are employed to do this class of work; whereas they claim that the right of making piles and carrying out such work belongs to the shipwrights. But the United Trades Council are divided in opinion about the question, and decline to say whether piling is the special work of shipwrights or joiners or labourers. Some contend that the work belongs to the latter more than to the ship-carpenter. We have also heard of complaints from bricklayers that roof-tiling is now done by slaters. Whether or not the bricklayer or the slater is the right person to cover roofs is a point that we need not discuss. There are some reasons for thinking the slater has a better notion of the requirements of a watertight roof as regards laying, "lap," and "gauge," and other points than the bricklayer; but at the same time tiling is generally considered to be a branch of the bricklayer's trade—he is by training the right person to undertake it. The fact of the work being often done by slaters is to lower the standard of the tiling in not a few instances. The two materials demand different treatment, and it by no means follows that the skilled slater is the best tiler. Again, indoor tiling is sometimes done by the plasterer, sometimes by the mason, though it is clearly a bricklayer's business. Each of these trades, it is stated, now claims the work as his own. We can hardly understand how the plasterer or the mason can claim the fixing of tiles to walls or floors; wall-tiling certainly requires the manipulation of someone who knows the



coursing and construction of brick walls and the properties of clayware. Taking masons' work, we find the same overlapping going on. The really skilled craftsman in this trade is an exception; journeymen largely recruit the ranks, those used to hard stone often doing soft-stone work; even adult labourers who are accustomed to the rougher work of "rubbing" and mason's yard labour are often engaged on the work of the mason. In this and other branches sub-letting has the advantage of employing men who do only one kind of work and have all the plant ready for it. Thus a contractor often sub-lets the stonework of a building to the quarry-owner, who does the cutting in the country; but as this is done, not at the quarry, but in local masons' yards near a railway-station, the worked stone supplied is better than much executed by the general contractor. Sometimes, indeed, the labour and material are sub-let to a sub-contractor who has made stonework a speciality and has all the plant at his command for moving and working the stone, and is, therefore, able to do the work much cheaper and better than the chief contractor can. And this is true of other trades as well; men who have facilities for employing skilled craftsmen and plant, and undertake contracts. They may be called special contractors, who employ trained hands in certain associated trades. The plasterer, for instance, may undertake to do the modelled work for ceilings and walls, and certain decorative features, slab and fibrous plasterwork, enrichments, &c. Overlapping takes place when the plasterer is employed to do work which properly belongs to the bricklayer, as in tile-fixing, metal-lathing—usually a smith's work. The plumber, too, undertakes a number of trades which properly belong to the painter, bricklayer, and smith and zinc-worker. We hear of complaints from gasfitters, hot-water fitters, who, with some justice, object to encroachments on their trades. What relation there exists between plumbing and gas or hot-water fitting we hardly know, except that pipe-laying and jointing is common to both. The plumber too frequently does the zinc-work on flats and gutters—a trade for which he may claim a certain aptitude; but in each of these trades a particular material is used, which is the chief distinction. When the plumber turns to iron or zinc, he is using a material which, to a certain extent, is unfamiliar to him, for which he requires a special knowledge. In the smaller shops, all those separate trades are undertaken. The evidence given before the Plumbers' Registration Committee affords proof of the fact that apprentices are now required to learn different trades; plumbing is being merged in other trades; there are "three and five-branch hands"—men who do drain-work, ironmongery, gas, and hot and cold water fitting. The master ironmonger also includes very often the above trades, besides ventilating and electrical fitting; the engineer who carries out the construction often manages to secure the ornamental ironwork, screens for lifts, and coil cases; and the modern "decorator" is still more omnivorous in his appetite, and contracts for all the trades, from the sanitary engineer to the paperhanger.

These encroachments have by no means been favourable to the crafts. The merging of one into other crafts has tended to a lowering of the quality or standard of workmanship, and the loss of that independence which formerly gave each craft a position of its own. And the same tendency has found its way into other branches of architecture. It is encouraging a specious kind of specialism which looks like a counter movement. If every man mastered his own trade there would be no excuse for a class of individuals who are at present springing up to do work of a particular kind better than the ordinary craftsman can do it

—individuals who are splitting up the professions and trades into mere fragments. And what are the advantages of overlapping in the building trades? A certain amount of smoothness in execution, the saving of supervision on the part of contractor or foreman, the making good to trades as the work proceeds, and so avoiding friction and delay. But are these to be weighed against the obvious drawbacks of the movement which has been fairly described as down-grade in its action?

#### WATER-COLOUR DRAWINGS AT THE GUILDHALL.

AT the art gallery of the Guildhall a unique collection of pictures representing the British School of water-colour painting, is now on view. The corporation have wisely followed exhibitions of the Dutch, Flemish, and Italian schools, with one illustrating works of our own national school of water colours. These yearly exhibitions are undertaken at great expense for the sake of instruction and profit. Here we have brought together a few of the choicer works from the commencement of the present century to the present time. We have not the works of Cozens and Girtton and their contemporaries, of what has been called the "stained drawing" period, as the earlier water-colour era was distinguished, but we have some typical examples of Turner, George Barret, Prout, David Cox, De Wint, Copley Fielding, and William Hunt, by whom the art assumed quite a new development, fostered by the Royal Water Colour Society, under Sir John Gilbert, R.A., whose work may be seen in two noble examples.

We have also here inimitable specimens of Rossetti, Ford Maddox Brown, Holman Hunt, Sir E. Burne-Jones, and other exponents of the pre-Raphaelite school, of whose earnest and deeper yearnings after nature and human emotions we can never grow tired. The series of vignettes by Turner, illustrating Campbell's poems published in 1837, are very interesting for their imagination, charm of colour, and detail, and have never before been exhibited. They are lent by Sir Donald Currie, K.C.M.G. But his more important works include his notable "Chryseis Worshipping the Sun" (8), in which are found passages of great beauty. The influence of Claude in landscape is perceived in this picture of 1811; the atmosphere and sunlight which suffuse every part of the scene, the waves of the sea breaking on the shore, and the priest of Apollo, praying in solitude to the sun, make a splendid composition. His "Wanderer" (7), and especially his "Worcester" (10), painted in 1804, with its dark rain-clouds and foliage contrasting with the lighted towers, are remarkable works which show his early manner. "Tivoli" (20), "Vevey, Lake of Geneva," and the view of "Chatham" are later, though marvellous, examples of colour and detail. Near these is an example of John Varley's broad touch and solid foliage in a landscape dated 1830; and a brilliant drawing by De Wint (14), "Harvesting," a sparkling and truthful rendering of golden fields. His other subjects, "Haymaking" (35), and "On the River Dart" (39), a fine example of his powers, are to be noticed. William Hunt's "Spring Flowers and Birds' Nests" is a charming study of primroses, violets, and nests, full of delicious detail, while other admirable examples are "Too Hot" and "The Restless Sitter," natural and wonderfully-drawn studies of chubby youth. G. Barret's "Sunrise" and "The Embarkation" (21) remind one of the Claude manner, the fine, serene skies, and gradation of colour and distance. Copley Fielding's work is represented in his delightful "Bow Hill Downs," a bit of the Sussex Downs, and the "blue Sussex Champagne," so called by Ruskin. "A Grand Scottish Landscape" is a fine picture with warm foreground, while in the distance rises a noble mountain range, steeped in blue mist at its base, almost Turneresque in conception and colour.

Of David Cox we see two or three splendid examples, all of great merit and interest. His "Sherwood Forest" is a grand piece of forest-painting, with its sturdy giant-like trees, and his singularly free touch of foliage. "A Hayfield," "Powis Castle" (26), and "Carting Home the Plough" (31), are especially broad, free, and representative examples; the latter, drawn on rough straw paper, is full of breeziness, the sky still retains its brilliance of blue and tumult

clouds; but his "Waterfall, Bettws-y-Coed" (24), is perhaps even more powerful, as exhibiting the qualities of the author at his best. It is an open-air sketch, on pieces of coarse grocer's paper pieced together. The work has a poetic grandeur, and a vigour and movement in the tumbling waters. Samuel Prout is represented by two works. His "Nuremberg" (36) is typical. "The Arch of the Rialto, Venice" (49), by James Holland, is admirable in its colour. The Oriental scene by J. F. Lewis, R.A., "The Harem of a Bey," is a large luminous interior of much detail, and there are works also by Carl Haag. We notice also a very fine landscape by R. Thorne Waite, "Changing Pastures" (57), and examples of A. W. Hunt (75), Albert Goodwin. Miss Ellen Gilbert lends a clever drawing of the "Pulpit of St. Alphege Church, Greenwich" (60), a fine oak carved 16th-century example. Birket Foster is represented by his fine view of "Ben Nevis" (62), and we see one or two very beautiful examples of that talented and subtle landscapist, J. W. North, A.R.A., as in the very delicate picture "Charles's Wain—Girl's Returning from a Christmas Dance at a Farm" (72), his "Wild Clematis" (71), and a "Somersetshire Trout Stream" (149), a delightful study of foliage and stream, exhibiting all the delicacy and subtle power of the master's pencil. Frederick Walker, A.R.A., may be seen at his best in "The First Swallow" and "Study of Mushroom and Fungi," both exquisite in fidelity and finish. The hawthorn blossom and subtle handling of both are exquisite in tenderness and fidelity.

Several important pre-Raphaelite pictures are hung. The "Supper at Emmaus," by Ford Maddox Brown, is too grotesque in its drawing, despite its sincerity of purpose. "The Younger Foscari" is a finer work, manifesting poetic power and feeling of much intensity. We here see Foscari embraced by his young wife before he returns to exile—a subject full of dramatic power and pathos. D. G. Rossetti's "Paolo and Francesca" is a marvellous piece of colour. The doomed lovers have met together in the second circle of Hell; in true pathos the painter depicts the passion expressed in the kiss which unites the two together, and sustains them in their endless torments. It is a noble impersonation of the story told in Dante's "Divina Commedia." "The Lady Lilith" (144), a reduced copy of a larger oil work, "The Magic Mirror" (146), are others. We have also two fine works by Sir E. Burne-Jones, "Love Disguised as Reason" (136) and "Green Summer." G. J. Pinwell's very beautiful composition of graceful figures, "Gilbert à Becket's Troth" (153), is charming in its sincerity, drawing, and colour. Works by Sir John Gilbert, R.A., Sir J. D. Linton's "Off Guard" (125), and by E. J. Gregory, A.R.A. (114) (113), Sir J. Millais, and other artists of repute may be mentioned, all characteristic subjects, and though some of them have been seen before, they still possess undiminished charms.

#### THE SOCIETY OF ARCHITECTS.

THE sixth ordinary meeting of the Society of Architects for the present session was held at St. James's Hall, Piccadilly, S.W., on Tuesday evening, the President, Mr. E. J. Hamilton, of Brighton and London, in the chair. Five nominations for membership having been read, the following eight gentlemen were elected by ballot as members:—James Alfred Cope Christie, 2, Bay View-terrace, Cape Town, South Africa; Archie Collett, "Ferndale," Cottage-grove, Southsea; Arthur Edward Fewster, 52, Victor-road, Holloway, N.; Horatio Holmes, 9, Hazelville-road, Hornsey Rise, N.; David Peacock, 1, Woodsome-terrace, York Rise, N.W.; William Perkins, Bishop Auckland, Durham; Herbert Sykes, Whitehall Buildings, Ann-street, Belfast; and William Henry Watling, Council Chambers, Newport, Mon.

#### DEVONSHIRE CHURCH SCREENS.

A paper on "The Rood and other Church Screens of Devon: Past and Present," was read by Mr. HARRY HERMS, of Exeter, Associate. The lecture was illustrated by numerous examples from the author's private architectural museum, and by seven drawings of screens and two-and-thirty lantern views. Having referred to the fact that it was nearly eleven years since he last read a paper before the Society, his topic then being "The Ancient Woodwork of Exeter," Mr.



Hems referred to the interesting character of the subject now to be considered, mentioning that the first church screen he restored was when, as an apprentice lad in 1860, he worked at the one in the fine church of St. Mary, Ecclesfield, Yorks, under the late Mr. Hadfield, of Sheffield. Devonshire screens have, the lecturer continued, a distinct family likeness. They are altogether more elaborate than anything of the sort Cornwall ever produced, and in some respects are different from those of Somersetshire. They are, in the main, built of English-grown oak. No chestnut was ever used; indeed, the only instance of this material I ever met with in screens is in the rood screen at Rodmersham Church, in Kent. In Devon we have rood and parclose screens galore; but I know of no tower screens. Here and again parcloes have been moved to the tower arch during recent years; but in no case have I found one that was originally placed there. The sills upon which the rood screens stood were usually always massive, and often very effectively moulded. As a rule, these sills run right through from end to end, under doors and under panelling alike. Thus they must have been constant stumbling-blocks to successive generations when entering or leaving the chancel. As a rule, in Devon we have no chancel arches. The arcades, taking a *motif* from the roof of our cathedral, run from east to west continuously, without a break. Hence the greater necessity for some distinct line of demarcation between nave and chancel. Stone screens are few and far between, and save the splendidly-contrived and superbly-wrought one at Totnes, few perhaps have such distinct merit as to call for more than passing mention. A number of churches lost their screens during comparatively recent times. First, we will speak of oak ones, and those of stone afterwards. Ashprington (St. David).—Nothing is left save some small fragments of the rood screen. In 1846 an architectural writer refers to a good screen and parcloes in fair condition. Ashburton (St. Andrew) formerly had a superb rood screen. The parish records say it was erected in 1525, at a cost of £20 1s. 6d., a large sum in those days. It was removed in 1718; where it went is not known. The pulpit and oak eagle lectern (same date) were sold to the parish of Bigbury, 1777, for £11 11s.; two parclose screens also disappeared. The lower panels of the rood screens had figures carved upon them in high relief; they were also painted. Painted figure panels are common in rood screens in the west as elsewhere, but they are rarely carved as well. The effect must have been most ornate. Ashcombe (St. Nectan).—The fine old screen was sold by the rector in 1820. Axminster (St. Mary).—This screen was removed in 1660. A parclose was there until recent times. Bradstone (St. Norma).—I possess a drawing showing this screen in 1840—four bays one of which is a double door. All has gone; but the rood staircase remains. Buckland Monachorum (St. Andrew).—Screen no longer exists. Broadhembury (St. Andrew).—Rood screen removed about 1851. Bratton Fleming (St. Peter).—All gone. Bulkworthy (St. Michael).—Nothing left. In 1847 the lower part existed, cut down to the height of the adjacent "pews." In 1873 the church was restored, and the very existence of the screen obliterated. Beaworthy (St. Alban).—All screen work gone. Bratton Clovelly (St. Mary the Virgin).—The screen was taken away in 1820. Bundleigh (St. James).—Screen disappeared in 1839. Brixham (St. Mary).—The fine screen disappeared prior to 1861. No one knows its present whereabouts. Bridestowe (St. Bridget).—The doors to the old rood stairs exist. It is said that carved oak benches, as well as much screen-work of about 1706, were destroyed here in 1869 during a "restoration." Cookbury (St. John Baptist and the Seven Maccabees).—All screen work gone. Cornwood (St. Michael).—The same mournful record. Challacombe (Holy Trinity).—All swept away, and as is far too usual, not the slightest traces left. Churchstanton (St. Paul).—The remains of a good rood screen are known to have existed early in the century. Taken down and sold about 1830. Cheriton Fitzpaine (St. Mary).—Screen destroyed in 1793. Culm Davey. In 1846 a record states that prior to that date the screen was destroyed by fire. Dean Prior (St. George).—The ancient screen was removed prior to 1875. Dunsford (St. Mary).—Screen removed 1813. Doddiscombsleigh (St. Michael).—In 1849 the lower parts of the rood screen and parcloes were intact. All has gone

since. Dawlish (St. Michael).—Early this century it is recorded that parts of the rood loft and screen were in position. All gone now. Exeter (St. Kerrian).—The destroyed church had an oak screen in it early in this century. Nothing is known of it now. Exeter (St. Sidwell's).—Lysons in 1822 tells us "an elegant screen with rich mouldings of vine leaves was taken down a few years before." When the edifice was rebuilt, save the tower and arcades, it was not re-erected. The architect for the rebuilding, who perpetrated this vandalism, was Mr. A. Burgess. He was the cathedral architect, too! Exeter (St. Petrock).—No screen exists here, but frequent references are made to several in the old parish accounts. Exbourne (St. Mary).—This screen was destroyed in 1831. Fremington (St. Peter).—There is a record in 1845 that the fine screen was taken down at the time of the alterations, which the writer defined as "wretched." No traces left. Gittisham. Screen gone; rood-loft stairs remain. The screen was in place so late as the "forties." Honiton Clyst (St. Michael).—All gone. Halwell (SS. Peter and Paul).—Screen carted away 1810. Hatherleigh (St. John).—The lower part of this once exceptionally fine rood screen removed 1867, and converted into a reading-desk. The upper part had been previously taken down (1820). About twelve years later portions were incorporated with the Jacobean pulpit (the latter has the date 1624 upon it). High Bickington (St. Mary).—Traces of stairs exist; screen and parclose removed previous to 1875. Hittisleigh (St. Andrew).—All screen work gone. Ide (St. Ida).—This church was rebuilt in 1834. The 15th-century rood screen was, like that of St. Sidwell's, removed at the time of taking down the fabric, and never replaced. No traces left. Ideford (St. Mary the Virgin).—Screen removed about 1840. The existing sanctuary chairs are said to be made of some of its wood. Ilfracombe (Holy Trinity).—Some remains of rood staircase in south wall. In 1858 fragments of the old screen were found. Kennerleigh (St. John the Baptist).—All screen work gone; few fragments in vestry. Kingskerswell (St. Mary).—All traces of screen gone. In 1847 some of the remains were utilised in the chancel as seats. Nothing is known of these fragments now. Kentisbury. In 1847 this screen was in good condition, and painted white. A few fragments alone remain. They are in the vestry. Kingsteignton (St. Michael).—In 1848 the portions of the screen remaining in the church were finely painted and gilt. What is left of them now is preserved in the vicarage. Some 'prentice hand has murdered the painting in the meanwhile. Littleham (St. Swithin), near Bideford.—Nothing of the old rood screen save its staircase remains. Lew Trenchard (St. Peter).—There was a good rood screen here once. My old friend, the Rev. S. Baring Gould, the rector, and well-known author, whose ancestors have held the living for generations, writes me:—"Alas! our rood screen was removed and destroyed by my grandfather in 1833. I have only a very few scraps of it. These I saved as a boy (about 1842) from the wood heap." Loxbear. The rood screen was destroyed in 1832. Meavy (St. Peter).—No traces of the screen left. Rood staircase *in situ*. In the "forties" the following report was made:—"Screen very good, but the groining missing. Its former existence only kept in remembrance by some mutilated fragments of soffit panels and enrichments, nailed to the naked spandrels. All painted white." Moreton Hampstead (St. Andrew).—The rood screen was *in situ* until 1857. The church was resetted then, and the screen taken down. Part of it was appropriated by a late Earl of Devon. The present Earl tells me he has no idea where the portion that came to Powderham is. Musbury (St. Michael).—Rood spiral stairs. N. and S. are all that are left of this screen. Mary Tavy (St. Mary).—Old staircase alone remains. A new screen and the rood figures have recently been erected. Monkhampton (All Saints).—All remains of screen cleared out, and church rebuilt (save tower) about 1856. Milton Damerel (Holy Trinity).—The spiral staircase exists, and some fragments of the rood screen are incorporated into the altar table. Newton St. Petrock (St. Petrock).—All gone, save parts of the rood screen preserved in the pew ends and pulpit. Rood staircase remains. Newton Abbot (St. Leonard).—This church, save the western tower, taken down in 1836, "for the benefit of the town." The fate of the fittings may be gleaned from the following advertisement in a local paper appearing

some years afterwards. The extract is from a notice of auction:—"The remainder of the collection (principally from the demolished church of St. Leonard, Newton Abbot) consists of a beautifully-carved pulpit, carved screens and benches," &c. Plymouth (St. Andrew).—The rood-screen was taken down in 1826, under the direction of a Mr. Foulton, architect. In April of that year the rood and parclose screens, with other internal oak fittings, were sold by his orders by auction for £134 15s., which sum was duly entered as received by the churchwardens. Poughill (St. Mary), near Crediton.—All gone. In 1844 the rood screen was in a fairly good state. Pancraswyke (St. Pancras).—Report says the handsome screen, certainly once here, was removed to a neighbouring church, but no one knows definitely where. Rockbeare (St. Mary the Virgin).—The rood screen was cut down to a level of the piers in 1793. The lower parts, quite undefiled by paint, were in place until 1887, when at the restoration they were removed to Rockbeare Court, where they now are. In design the Rockbeare screen appears to have been identical with that at Pinhoe. Romansleigh (St. Rumon).—Lysons speaks of the remains of a screen here in 1822. Nothing remains now, however. The church was entirely rebuilt a few years ago, and the place that once knew the screen will know it no more for ever. Plympton (St. Mary).—Two doorways that led up to the rood are now the only remains of the fine screens once in this church. Seaton (St. Gregory).—Some evidences of the rood-loft stairs remain—nothing more. Sampford Courtenay (St. Andrew).—In the year 1831 the rector of this parish, who was also rural dean, directed the rood screen should be removed or placed further west. Doubtless it was "removed" altogether, as no remains exist now. Spreyton (St. Michael).—The screen was cleared out by misguided hands in 1758. Tradition says it was a remarkably fine one. Shobrooke (St. Swithin).—The rood screen was removed 1577. South Tawton (St. Andrew).—The screen appears to have been finally cleared out about 70 years ago. The staircase entrance to rood exists. Sherwell (St. Peter).—The screen has gone. In 1847 it was referred to as a fine one. Sampford Peverel (St. John the Baptist).—The rich and curious old rood screen described by Lysons (1822) has since been cleared out. Rood staircase remains. It—the screen—went about 70 years ago. Some aged people in the village remember it, and refer to its great beauty. Stoke Rivers (St. Bartholomew).—The beautiful carved oak work, the screen bench ends, &c., were cleared out of the church in the "Churchwardens' period." Most of it was bought by Lord Fortescue, and is now in his old family residence at Wear Gifford. A little is in the church there. Portions of the screen are preserved in private houses in South Molton. Shaugh Prior (St. Edward, King and Martyr).—The rood screen still exists—nothing more. The architectural curio of this Dartmoor border church is its stationary font cover. I practically saved it (1878) from a neighbouring barn, into which it had been turned at a restoration. It is of Early 16th-century work, probably spiral, and stands stationary on the font. The lower parts open when required to be used, like a triptych. A somewhat similar one (portions) exists at Cockington. There are other examples in the eastern counties—viz., East Malling, near Maidstone, Ticehurst, Walpole St. Peter's, Trovington, West Walton, Bramford, Fingringhoe, near Colchester, &c. Tetcott (Holy Cross).—A rood screen was here in 1858. Nothing left. The present churchwarden, who has held office for a quarter of a century, says he never saw it. Thrushelton (St. George).—Rood staircase only left. Tiverton (St. Peter).—The rood screen in this, one of the finest of Devonshire churches, went at the restoration in 1854. So did the parclose. The former was groined and painted, the prevailing colours blue, red, and gold. The rector moved it, or some of it, to Holcombe Rogus Church, where it still seems to be doing duty. The reason it was turned out at Tiverton was because it was deemed by the architect past repair. It still does good service at Holcombe Rogus, and why 42 years ago it was not good enough for Tiverton, is a question the late Lord Dunsford would have said, "No fellow can understand." East Teignmouth (St. Michael).—There was a screen at this church in Lysons' time (1822), but nothing is known of it now. Tormohun, Torquay (St. Saviour's).—A screen, with joists of rood loft over the Ridgway chapel, was in place in



1822. Nothing whatever is left of it now. Thurlstone.—The screen has gone. Incisions in the columns show where it stood. Some fragments of the destroyed screen are at present "made up" in the altar table. Venn Ottery (St. George).—The rood stairs only remain. In the rural dean's book for 12th April, 1844, permission is given the wardens to cut up the beam of the rood screen, and use the oak in the needful repair of the fabric. Wembury (St. Werburga).—In 1852 the screen in this church is referred regretfully to as "taken down and destroyed by an ignorant churchwarden a few years ago." Whimble (St. Mary).—"Magna Britannica" (1822) refers to part of the original screen existing. Nothing known of it now. West Oghwell.—The screen existing early this century entirely gone. West Buckland (St. Peter).—Early this century the screen is described as ornate and most interesting. The church was rebuilt 30 years or so ago. The old screen was taken down then, and never re-erected. But when the famous screen at Swymbridge was restored by Mr. Pearson in 1880, all the fragments that still remained of the West Buckland screen were incorporated into the latter. Yarncombe (St. Andrew).—There are now no traces of the rood screen. The staircase and turret by which it was approached are in goodly repair. This concludes, I am afraid, a very incomplete list of no less than 80 Devonshire churches that apathy, greed, ignorance, fanaticism, or rightdown wilful wickedness, respectively or combined, have deprived of their chief glory and pride—their carved oak 15th-century screens. Stone screens missing:—Churchstanton (St. Paul).—The remains of a stone parclose screen are referred to as existing in this church early in the present century; all traces gone. Luppitt (St. Mary).—There were two stone screens here—a chancel screen, and one making the north transept into a chantry. Both have been cleared out, and fragments of them may be found built into mantelpieces in houses hard by. Marldon (St. John the Baptist).—There was a chancel screen destroyed early this century. Some of it is said to be built up in the walls of the church, but some fragments remain intact in the parvise. Tiverton (St. Peter).—In 1835 the exquisite stone screen between Greenway's Chapel and the body of the church was taken down because, forsooth, it was said to impede the sight and hearing of the occupants of the chapel. A late Lord Devon, seeing this lovely carved work lying in a heap, uncared for and forgotten, in the graveyard, begged them, and removed the precious fragments to Powderham Castle. At the general restoration in 1855, Lord Devon offered to return them to the church if the churchwardens would re-erect it; but they declined the offer on the score of expense. The present Earl of Devon told me the other day he had no idea where the remains are now, and no one else in the neighbourhood seemed to either. There are missing, therefore, four in all, being one-third the number of the churches that, so far as we are aware, ever possessed stone screens. Now let us turn to existing stone screens. As in the wooden ones, only one material was used, Beer stone, quarried continuously for nearly a thousand years upon the south-eastern coast of the county. The finest of all by a long way—indeed, probably the handsomest example of a stone screen in any of our parish churches—is at Totnes (St. Mary). It was made by order of the Totnes Corporation in 1460. The orders were to make it like unto the screen west of the Lady-chapel in Exeter Cathedral; but whilst very like the latter, it far exceeds it in beauty and elaborate detail. It is 60ft. long, and is full of light tracery, rich with niches and tabernacle work. It has parclose screens of rather unusual design. The rood screen is groined on the west side only. All the tracery in the fan groining is pierced through. All along the western façade are canopied corbels for statues. The whole has been well restored by the late Sir G. G. Scott, R.A., and his sons. Old Mother Peters, the butter-woman of 30 years since, always told visitors "the screen was brought over by the Spanish Armada." Awliscombe (St. Michael).—Chancel screen, not groined, but substantially traceried with angels at the springing of arches, central doorway, Bideford (St. Mary).—Screen on south side. Colyton (St. Andrew).—Two screens. Culmstock (All Saints).—Rood screen now doing duty as a reredos, and Mr. R. D. Blackmore, the author of "Lorna Doone," introduces it into one of his latest novels, "Perlycross." It had been taken down and stowed away at the west end during the last century. The talented author's father, I believe,

was at the expense of placing it where it now is early in the present century. Hemrock (St. Mary the Virgin).—Screen between chancel and north aisle. Ottery (St. Mary).—Two remarkable screens, one at the entrance to the Lady-chapel. Paignton (St. John Baptist).—Elaborate canopied screen of monumental character. Thus there are eight churches with stone screens in them. In the following churches a few remains of oak screens exist:—Bere Ferrers (St. Andrew's); Chorston Ferrers, screen and parclose were taken down in 1866, remains stored away, but have been fixed recently in the tower arch; Christow (St. James), Clawton, Cockington (SS. George and Mary), Cheriton Bishop (St. Mary), Down Exminster (St. Martin), East Down (St. John Baptist), Gidleigh (Holy Trinity), Heavitree (St. Michael), Ideford (St. Mary the Virgin), Hatherleigh (St. John Baptist), North Lew (St. Thomas à Becket), St. Mary Church (St. Mary), Mamhead (St. Thomas), Marystowe (St. Mary), Morchard Bishop (St. Mary), Peter Tavy (St. Peter), Silverton (St. Mary), Stoke Gabriel (St. Gabriel), Sheepstor, North Petherwin (St. Paternus), Powderham (St. Clement), Sheldon (St. James), Sherford (St. Martin), Sutcombe (St. Andrew); Stockleigh Pomeroy (St. Mary the Virgin), portion of the rood screen, which has been removed to the west end; Trusham (St. Michael). Widdecombe-in-the-Moor (St. Pancras).—Very good what is left of it; painted figure panels. Warleigh (St. John).—For some years prior to 1850 fragments of the taken-down screen were lying about in many pieces neglected and uncared for. In that year they were put together and incorporated into a new tower screen now in the church. It will thus be seen that fragments exist in 31 churches in all. Good screens exist in the following churches:—Abbots Kerswell (St. Mary).—Good screens and parclose; the supposed works of the monks of Sherbourne. Buckland-in-the-Moor (St. Peter).—Rood screen stairs, elaborately carved and illuminated. The parclose screens were removed in the 17th century. Bampton (St. Michael).—Fair screen, groined both sides. Staircase to rood. Date 1450. Bow (St. Bartholomew).—Chancel screen and N. parclose. Screen panels (rare). Bovey Tracey (St. Thomas à Becket).—Groining new, rest old. Lower panels are painted representing the memorable quarrel between Henry II. and Thomas à Becket. Bridford (St. Thomas à Becket).—Fine screen, something like Dartmoor; good condition and elaborately coloured. Rood staircase intact. Burslemombe (St. Mary).—Fairly good screen. Broadhemstone.—A good screen the width of the church; rather late work. In this parish a stream called the Hems flows into the Dart. Blackawton (St. Michael).—Fine screen; rood stairs, curiously painted with lovely shades of vermilion and blue. Burrington (Holy Trinity).—Good screen, Henry VII. date. Broadwoodwider (St. Nicholas).—Fine screen. East Budleigh (All Saints).—Fair screen; arcade of five bays. Baughford (St. Mary).—Very perfect screen. Cornworthy (St. Peter).—Fairly good screen. Chudleigh (St. Martin).—Chancel screen, carved one side only. Cruwys Morchard (Holy Cross).—A well-carved screen, in excellent condition. Calveleigh (St. Mary).—Two good screens, of different designs—one now placed across the tower arch. Rood loft fell to pieces in 1887. One screen seems to have come from another church. Chumleigh (St. Mary Magdalene).—Fairly good screen. Coleridge (St. George).—Fair screen, with three doors complete. Combe Martin (St. Peter).—Good rood screen and a parclose rood staircase exist. Chawleigh (St. James).—Very fine screen, exquisitely groined, unusually high and effective, cresting rood staircase. Chivelstone (St. Sylvester).—Good screen and rood stairs. Dittisham (St. George).—Fair screen across church, moved, at some time or other, more eastward than it originally was; same colour. Dodbrooke (St. Thomas à Becket).—Good screen, minus groining, parclose in north aisle. Dartington (St. Mary).—The old screen from a former church now stands in the new one built by Mr. Pearson, R.A., in 1880. Denbury (St. Mary).—Fair screen, rood stairs. Exeter (St. Mary Steps).—Fair screen, removed from the destroyed church of St. Mary Major, called variously St. Mary More and St. Mary Michel—Michel from the Anglo-Saxon word micel—i.e., much, whence the Scotch word mickle. This church, with its Norman western tower and Early English chancel arch, standing near the west front of the cathedral, was pulled

down, alas! by the late Mr. E. Ashworth, architect, in 1866. Ermington (St. Peter).—Chancel screen (Jacobean). Feniton (St. Andrew).—Very handsome screen and parclose. Holberton (All Saints).—Good screen, rood staircase, but no rood screen. Holcombe Rogus (All Saints).—Curious screen, Early 16th-century Italian work. Remains of Tiverton church screen already referred to are here. Heanton Punchardon (St. Augustine).—Good screen. Holne (Virgin Mary).—Fine screen in fair preservation, rood stairs, painted figures on 40 lower panels, very interesting. Kingsley, the Devonshire author, was born here. Hartland.—Rood screen very fine, and in excellent condition; parclose good. Applepen.—Good chancel screen and parclose, rood stair-groining destroyed by the Puritans. Ilslington.—A fine rood screen, groining gone. In this church are some poppyheads. Atherington and Buckland Monachorum are the only other churches in the county I have seen old examples of poppyheads in. Kentisbeare (St. Mary).—Fine screen, doors lacking; rood stairs; traces of colour and the Arms of the Whiting; made time Henry VII.—it is suggested by artificers from Tavistock Abbey. Kingsnympton (St. James).—Interesting screen. Kingsbridge (St. Edmund, King and Martyr).—Parclose screens, much like those at Aveton Gifford a few miles away. Rood screen gone; some of its panels incorporated in the pulpit. Little Hempstone (St. John the Baptist).—Rood screen and parclose in good condition. Lustleigh (St. John the Baptist).—Good parclose. Rood screen rather late. Lapford (St. Thomas à Becket).—A very fine screen, indeed, but rather late work. Littleham, near Exmouth (SS. Margaret and Andrew).—Fine screen and north parclose. Marwood (St. Michael).—A good screen across north aisle. Rood screen stairs exist; screen itself removed and destroyed within living memory. On the existing screen "Sir John Brapal, p'son of Merrwood" is carved on the door panels; he was rector in 1520. Monkleigh (St. George).—Fine screen, richly carved. Manaton (St. Winford the Abbess).—Good rood and parclose screens. North Petherwin (St. Paternus).—One third of lower part of this screen exists, and two parclose. Date about 1530. The screens were never painted. North Bovey (St. John the Baptist).—Fairly good. North Molton (All Saints).—Good screen right across the church 11ft. high; rood stairs exist. Ottery (St. Mary).—Two fair parclose. Payhembury (St. Mary).—Good rood and north aisle screen, rood stairs. Date 1450. Parracombe (St. Helen).—The existing screen has not been touched since 1780. About that date part of rood beam was cut up for pew ends. Pilton (St. Margaret).—Very good screens; linen panels. The 15th-century font-covers are the best examples in Devon. Plymtree (St. John the Baptist).—Good screen, not unlike Talaton's in some respects. Rattery (Blessed Virgin).—Good screen and two parclose. Southpool (St. Nicholas).—Good screens. Stoke-in-Teignhead.—Fine rood screen; Richard II.'s time. Slapton (St. James the Greater).—Rood and two parclose screen. South Milton (All Saints).—Fairly perfect screen. Stokenham (St. Michael and All Angels).—Good screen. Tor Brian (Holy Trinity).—Excellent screen. Tawstock (St. Peter).—Two screens, very good. This church contains a curious recumbent figure of wood, representing Thomasin Hankford, heiress of the illustrious family of Fitzwarren. Talaton (St. James).—Good rood screen. Ugborough.—Fairly good rood and parclose. The former was cut down to the level of the seats by order of the vicar, in order that the congregation might see him better! Thirty-two painted panels. Warleigh (St. John).—Screen removed to tower arch at some time. Willand (St. Mary).—Good screen; some traces of colour—red, white, and gold. Wolborough (St. Mary).—Good screen. Welcombe (St. Metan).—Screen nearly intact. Washfield (St. Mary the Virgin).—Curious Jacobean screen, made in 1624 by Henry Sebright. So there are sixty-eight churches boasting of good old screens. Devon's best screens are probably (from my own observation) Alphington (St. Michael), Atherington (St. Mary), Berry Pomeroy (St. Mary), Bradninch (St. Dronysius), Colebrooke (St. Mary), Cullump-ton (St. Andrew), Dartmouth (St. Saviour's), Harberton (St. Andrew), Honiton (St. Michael), Kenn (St. Andrew), and Kenton (All Saints), all of oak; Totnes (St. Mary), stone; Staverton (St. Paul), Swimbridge (St. James), and Uffculme (St. Mary the Virgin), all of oak. The latter church has



the longest screen (67ft.) in the county. Atherington's screen is small, but unique. It alone has preserved its gallery, the only old existing one in Devonshire. Colebrooke boasts of a screen totally unlike any other. It is in the Coplestone aisle; the lower part has linen panels, but all the portion above the transom is particularly curious. The screen at Bradninch is 51ft. wide at base and 53ft. at the top of the groining, the cornice above which stretches out into the soffit of the N. and S. windows. On its lower 52 panels are painted saints—one for every week in the year! A capital N. parclose was moved some twelve years ago and placed under the tower arch. It is well painted. These screens date from 1450. The Berry Pomeroy screen is groined on both sides and 46ft. long (ten bays and three doorways—doors missing). Remains of original paint (gold, vermilion green, and white) on the two parclooses. Harberton's screen is 41ft. long. It has 11 bays, inclusive of doors, and there are two light parclooses. The peculiar feature at Harberton is the panelling around the N. and S. piers through which the screen cuts. At Kanton there are a number of odds and ends, formerly belonging to what must once have been a particularly fine gallery, and Swynbridge's screen (restored by Mr. Pearson) is a typical West-country one of the best class. The ornate screens at St. Saviour's, Dartmouth, are so well known that they require little mention from me. The screens at Honiton, under the direction of the late Mr. Ashworth, architect, I restored in 1880. Kenn's screen is very handsome. I restored it some few years ago under Mr. R. Medley Fulford, architect. It was the first screen in Devonshire to have the rood and accompanying figures erected. I placed them there in 1885. Of all screens, restored or otherwise, in the Western land—if we except Culmington's—that at Staverton takes the precedence, as the finest and most interesting. It has 17 bays, and is 50ft. long and 15in. high. It was restored by my sons and self in 1890-1 under Mr. Bond, the architect. I bow my head to Culmington's three screens as the most superb, by a very long way, in the West of England. The rood screen is 54ft. long, and has the three doors intact. There are two parclooses. The north one has a series of continuous shields on its north and south sides above the main cornice, forming a bold super-cornice. They are emblazoned with arms. High above the lovely rood screen itself is an ornamental rood beam supported by angels. On the east side of this the iron stay is still remaining that helped to steady and hold the neat crucifix beneath. This latter in its turn rested upon the rood loft. The Golgotha is now in the western tower. I know of no other example in England. It has evidently been carved out of the butts of two oak-trees, measuring 9ft. 6in. by 1ft. 6in. by 1ft. 9in. high and 6ft. by 1ft. 6in. by 1ft. 9in. respectively. The wood is hewn and carved to represent rocks with skulls, cross thigh-bones, and shoulder-blades upon them. The mortise-hole cut to take the central cross is 7in. by 4½in. on plan. The screens at Aveton Gifford, Buckerrill, Combe-in-Teignhead, Feniton, Littleham, Pinhoe, Plymouth, Poltimore, Sutcombe, and South Pool are amongst some of the Devon screens my sons and I have restored from time to time, and other interesting screens have also been well cared for by others, of which, however, I have no data. Among some new screens in old churches are the following:—Ashburton (St. Andrew).—Rood and two parclooses; the late Geo. E. Street, R.A., architect. Butterleigh (St. Matthew).—Rood; the late E. Ashworth, architect. Clyst St. George. —Two parclooses; Mr. R. Medley-Fulford, architect. Newton Ferrers (Holy Cross).—Two parclooses; Mr. George H. Fellowes-Pryne, architect. Monkleigh (St. George).—Parclose; Mr. H. R. Medley-Fulford, architect. Plymouth (St. Andrew).—Two parclooses; the late Sir G. G. Scott, R.A., architect. Wembury (St. Werburga).—Three parclooses; Messrs. Hine and Odgers, architects. The screens at Ashburton were made and put there in 1883. The rood and screen has a carved cornice. This is not a local feature, but the late Mr. Street was not so conservative in the matter of local tradition as was the late Sir Gilbert G. Scott. Twenty-eight years ago, at the latter's suggestion, I hired a donkey-cart in North Devon, and lading it with a couple of sacks of plaster of Paris, some modelling clay, and squeezing-wax, with a small boy as my sole companion, for more than a week travelled from one old church to another taking casts, in one and all of them, of the best tit-bits of

15th-century ornament I could find. The products of that little journey adorn the walls of my studios to this day. Plymouth's parish church is one of Devon's best Ecclesiastical buildings. The edifice was restored by Sir Gilbert Scott some 25 years since. Before closing, I venture to call attention to the colossal rood I made some few years ago, as a votive offering to my own parish church, St. Sidwell's, Exeter. An aggrieved parishioner arose at the wrong moment, however, and prevented its erection. Since then it has found honour of men, and has been awarded International Exhibition medals (gold, silver, and bronze). And now let me say "Au revoir, but not good-bye," for if I have succeeded in interesting you this evening, I will ask permission to come again at no distant date to read you then yet a third paper, entitled "The Screens of Exeter Cathedral." I meant to have included them in the present one; but the extent of ground travelled over has rendered this impossible. Besides the photos and drawings, 168 distinct examples of old Devonshire carvings are exhibited. Two hundred and twenty-three churches are referred to in this paper—viz., those which have lost their screens (oak), 80, ditto (stone), 4; those with existing stone screens, 8; those where a few remains of oak screens exist, 31; those with good (oak) screens, 68; the best screens (oak), 14; churches in which are restored screens, not included in the above (13 screens), 10; fourteen new screens we have put into old churches, 8—total, 223.

Mr. H. A. SAUNDERS, M.A., in proposing a vote of thanks to the lecturer, referred in eulogistic terms to the works of restoration carried out by Mr. Hems, whose knowledge of ancient West-country woodwork was, as could be gathered from the paper just read, extensive and, indeed, unique. Such a lecture, giving in tabulated form all the existing examples of screens and other carved work in Devonshire churches at the present day, would be of permanent value. All the work illustrated by lantern views and by actual specimens was of Late Perpendicular period. Was there no Decorated woodwork? He should like to know if there were any remains of Mediaeval rood-lofts.

Mr. HENRY LOVEGROVE seconded the vote of thanks, which was supported by Mr. G. H. GUILLAUME, and, on being put by the President, was heartily accorded.

Mr. HEMS, in replying, said he wished to be allowed to include in the motion of thanks the name of Mr. G. A. T. Middleton, who had kindly shown the lantern illustrations. He feared that the extent of his subject had reduced his address from a handbook to the Devonshire screens to an index. Very little of the woodwork in Devonshire was earlier than the middle of the 15th century, and some of it was very late. Most of the work was in one style, and was originally decorated in colour and gilding; but the effect was not always good, and in many cases it had been obliterated by whitewash, or even by repainting and graining. He must admit that the colour decoration was not so good as that to be seen in Norfolk and Suffolk, but there was a really fine 16th-century example in the north aisle of Atherington Church, which seemed to have been made for another place. There were no ancient roods in Devon, and the only place where the hole could still be seen in the beam for the insertion of the cross was at Culmington.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening, Mr. Aston Webb, vice-president, in the chair. The deaths were announced of the Chevallier J. da Silva, of Lisbon, architect to the King of Portugal, who had been an honorary corresponding member since 1864, and of Arthur Billing, late of Tooley-street, S.E., retired Fellow.

#### THE ARCHITECT'S USE OF COLOUR.

Papers on this subject were read by Mr. HALSEY R. RICARDO, architect, and Mr. CHRISTOPHER W. WHALL, painter, and were illustrated by examples of various coloured building materials lent by Messrs. Joseph Cliff and Co., of Wortley (glazed bricks and tiles), Messrs. Simpson and Co., St. Martin's-lane, and Messrs. Powell Brothers, of Whitefriars. In his introductory remarks, Mr. RICARDO said he should purposely be trenchant, as

he wished his remarks to be provocative of discussion. He pointed out what a powerful resource to the architect was colour. As he passed through our streets, colour, in the contents of shops, in tiled window-boxes, in the scarlet splendour of a chimneypot backed by the immeasurable blue of a London sky, was the chief thing that attracted the architect's attention during his walk, and afterwards dwelt in his memory. And colour was, indeed, almost the only resource left to him. In our modern streets, except in the rare cases where monumental architecture was possible and permitted, the regulation type of architecture seemed strangely superfluous. Who wanted to see the pomp of cornice and pilaster, of architrave and string? Certainly not the passer-by, for without them the street would be wider and clearer; and as truly not the owner, for he obscured the features he went to the expense of putting up with great gilded letters setting forth his name and trade. They could only be erected to please the architect, and he must have been in dreamland when he devised them. The cornice, for example, which should be brilliant with graduated light, was black with the smears of sooty water; the soffits, which should be dark, remained of the comparatively light natural colour of the stone, and were being shredded by the corrosive action of damp; the shape and solidity of the columns were hidden by a black lichenous growth, and the sparrows built in the capitals, or those features were hidden in wire cages to keep the birds out. And all this mass of apparent solidity frequently rested on a sheet of plate glass set on edge. The remedy for all these evils was colour. With the use of colour mouldings and projections could be foregone; the effect could be produced by other means; the lights and shadows might be placed where the designer pleased. Indeed, he believed that they might if they chose build their street fronts without cornices, strings, or window-sills, and yet gain the thanks of all who used the thoroughfare. With what should they build? The facing materials must not be affected by the town's atmosphere. This excluded the use of terracotta, marble, brick, and stone, but left them polished granite, glazed bricks, and tiles. It was true that the softening influence of time would thus be unavailable, and then buildings would never look any better than on the day the scaffolding was struck; but since the broderie fashioned by age was made of soot, while the materials weathered and decayed at differing rates, he did not think any great sacrifice was thereby involved. He would urge the architect to adopt a large and broad treatment in his employment of colour. Out-of-doors effect, not detail, was demanded; they needed bands and diapers among which the windows could locate themselves without regard to pattern or symmetry. The value of the pattern was as a convenient system of gradation; but he did not regard this as the final ideal of outside colouring. They might in time reach the modelled figures of Susa, and might impress in their service the romance and portraiture of their age. He should be glad to think that the plentiful use of cut brick in their streets might be taken as the sign of a craving for colour, for it possessed no other justification, and it was as costly as it was short-lived. He urged the value of glazed tiles for surface decoration: they proved a permanent piece of colour, rainproof and smoke-proof, and gave variety and distinction to a building. It might be said that the sheen of glazed surfaces would be trying, but their pristine brilliancy would soon be lost. Passing on to consider the internal use of colour, Mr. Ricardo remarked that our rooms were more distinguished from those of other people by their colour than by their furniture or pictures, and not so much by their absolute tone as by their harmonies. Where colour was freely employed, mouldings could to a large extent be dispensed with in furniture. In conclusion, the lecturer urged the value of the employment of colour in large masses, and referred in terms of high approval to Mr. William Butterfield's works, especially at St. Mary Church, near Torquay, and at Keble College, Oxford.

In a second paper, Mr. CHRISTOPHER WHALL remarked that painters watched architecture a great deal more than was imagined by architects, and not being able to enter into all the subtleties of construction, and therefore unable to appreciate fully all the harmonies of form and proportion springing from this constructive basis, their attention was chiefly arrested by that quality in which they themselves were specialists. Too often artists were daunted and baffled by meeting



at the outset flagrant, frequent, and needless sins against the harmony of colour, and much unnecessary neglect of its resources. When they saw eminent architects, to whom they looked for light and leading, facing their buildings with harsh, flat, shiny, ochreous, drab terracotta, or when they saw fearful discords in purple slate or green slate, used in conjunction with red sandstone or red brick, artists turned at once from buildings which might possess great beauties of other kinds because presented in these colours. He felt sure that as to colour architects were at a disadvantage, from the practice of solving all their problems on paper. A great danger was threatening the revival of the association of painting with architecture—he referred to the lamentable and growing practice of painting mural decoration in studios and then having it fixed up. This need never take place. If the work could not be done on a plaster surface, the canvas could be put up plain and afterwards painted *in situ*. This was the method he recently adopted in executing a mural painting for a London church. Painters thought that architects ought to get more out of their offices: it would be turning the tables upon his profession if they brought their studios into the buildings. He recently called on an architect friend who was examining a number of 18in. square samples of fabrics on his office floor. He welcomed the lecturer with the remark that he "was so glad to see him, as perhaps he could help him to choose a dossal." "Oh," he replied, "surely that hangs at the back of an altar; but you appear to be selecting a carpet—why not hang it on the wall?" His friend took his suggestion; but he found it difficult to estimate the effect, and so made a further suggestion. "Why don't you take your patterns down to the church, as you will then be able to judge of the amount and quality of light in the chancel, and how it is affected by windows? &c." The architect replied that he had wanted to recommend some one fabric to the parson as the best, having selected it beforehand; but he adopted the suggestion, with the result, as the lecturer had anticipated, that when he hung the patterns in the chancel, not one of them proved satisfactory. Turning to the use of colour in buildings, Mr. Whall showed a gigantic palette, on which he had placed samples of building materials. Beginning with a dab of whitewash next the thumb, the gradations passed on through marble, Portland, Bath, and sand stones, bricks, granites, slates, to tar at the other end of the scale. When he was a student, it was impressed upon him that when he made a sketch of a landscape he ought to introduce then and there a figure to give colour and scale. He suggested that if the architect took his sample of material to the spot, and put it up at such a distance from the eye as to cover about the area the material was to fill, while it would not tell him everything, it would give him some information. It would take him out of his office and away from his theories, and put him in touch with the locality and conditions. He believed it was possible, with a very small bit of material, to judge approximately of a large area of the same. The talk about the effect of aerial perspective was only a bugbear, which, for practical purposes, might be disregarded. There was one resource of which architects failed to take full advantage—viz., the varieties of colour which existed in any one material. In roofing materials, for example, architects asserted that it was very difficult to induce the proprietors of quarries to let them have slates that were not assorted into batches of matched colour. Nature mixed her stone, and that was equivalent to observing that stone was more beautiful when mixed; but merchants delighted in sending out their building materials "well matched to sample." Yet, if architects would only combine, they could soon change all that, for builders' merchants were very sensitive to the fact that the demand will create the supply. He often wondered at the comparative rarity with which he saw in the architects' offices he visited samples of materials, sketches of scenery, or even cases of butterflies to brighten the general dinginess. Indeed, it seemed as if an architect's practice consisted in staring at a sheet of white Whatman's paper from ten till two, and then, with a short colour interval for lunch, in staring at another sheet of white paper from three till five. He would recommend architects to adopt more experience in proportion to the paper-work, and the treatment of the latter merely as the sketch for the finished picture represented by the actual building. Colour schemes should be

founded upon nature, and conditions should be frankly accepted. The architect should further strive to work more on the spot to be occupied by the building, and less in a central office; should use, as far as practicable, local materials in all country buildings; should give more attention to tint, texture, and quality in the treatment of surfaces, and should endeavour to use a more varied range of materials, and seek to create in ordinary trade a supply of material less rigidly assorted, both as to size and tint. Probably this would demand a radical change in the outside conditions imposed on architects, including more elastic forms of contract, and more human relations with client and contractor, more dependence on craftsmen, and a more dependable race of craftsmen to depend upon, and, lastly, a new race of clients, less disposed to regard the building of their houses as a strictly business arrangement.

Professor GEORGE AITCHISON, A.R.A., proposed a vote of thanks to Messrs. Ricardo and Whall, and remarked that the men who made the fine stained glass of former days must have possessed almost divine attributes. No one could look at the windows of Chartres, and other French cathedrals, the aisles of Canterbury, the old work in Cologne, Strasburg, and Florence, and in many of the mosques at Cairo, without being charmed by the brilliancy, harmony, and variety of colour therein displayed. More than a quarter of a century ago the speaker pointed out that the use of glazed-brick surfaces would be not only more pleasant than ordinary brick or cement in manufacturing towns and in London, but even more economical, as they could be washed instead of needing periodical painting. He quoted Viollet le Duc's vision of what a well-ordered Paris might be. Most of Mr. Whall's suggestions were excellent, but the difficulty would be to put them into practice. He thought they would all be glad to have the new class of contractor, craftsman, and client, and would even welcome the new sort of architect sketched by Mr. Whall in such alluring colours. It would be difficult to find the client who would allow experiments to be made with a building as it went up, and very few that would allow a wall to be built and taken down for experimental purposes to try the effect. There were great and obvious difficulties in the way of trying schemes of colour on the spot.

Mr. H. H. STATHAM, in seconding the vote of thanks, questioned the length to which Mr. Ricardo had carried his advocacy for colour; he surely could not have seriously intended to assert that nothing else was worth attention in street architecture. As a rule, both in construction and in furniture, in all countries, when the mouldings and other details were flat and meagre the colour was more vivid, and *vice versa*. In fact, shadow and colour fought with each other; where the mouldings were refined colour was almost disregarded. He regarded the decorations now in progress at St. Paul's Cathedral as most successful, except that some of the details were too small; but it was a grave question whether the work was not too good for a building of such detail and materials; the rich woolly effect belonged rather to a Byzantine than to a Renaissance edifice. French architects were using coloured tiles, but they used them in panels and little bits, instead of the massed polychromy which he regarded as preferable. He could not agree with Mr. Ricardo in his admiration for Keble College, nor should he advise young architects to study it. Mr. Whall's paper was of great interest and originality. The pernicious practice of executing mural decorations in the studio, which Mr. Whall rightly denounced, had come from France, where many works of this kind were painted, not for the buildings they were ultimately to adorn, but primarily for exhibition at the Salon; the method was fatal to decorative painting. He doubted if the experiment recommended by Mr. Whall of holding a brick 6ft. high could represent the effect of a wall 100ft. away, for apart from the loss of aerial perspective, there was the texture to contend with. He did not think Mr. Whall had been quite fair to architects in saying that they only looked at white paper. In most architects' offices many samples of coloured materials and examples of work in colour were to be seen.

Mr. JOHN BRETT, A.R.A., thought a broad distinction should be drawn between the classes of colour as used in architecture—naturally coloured materials used in construction, and specially applied colour added to the exterior or interior of the building. The reasons why London houses

were not more beautifully decorated were, first, the short tenure on which they were held by the occupiers, and secondly, the soot-laden atmosphere and the filthy London clay on which the Metropolis stood. The finest example of the application of colour to house architecture in London was, in his opinion, the late Lord Leighton's house, designed by Mr. Aitchison, where choice figured marbles, beautiful Oriental tiles, and an admirable mosaic frieze combined to produce a permanently beautiful effect. A good example of the improvement wrought by the softening hand of time on applied colour was formerly afforded at the Loggia in the Vatican; when he first saw this apartment the colours had faded in a harmonious whole, but in an evil hour a painter was set to work to "restore" the work, with the result that the unpleasing Arabesque patterns were brought out so vividly in crude colour as to produce a harsh and restless effect. Uniformity of colour and crudeness were two evils to be avoided in applied decoration; but if the colours were varied, the expense was greatly increased, for, as Charles Keene put it in the workmen's imaginary criticism of a painting, "It's not the expense of the paint, but the man's time in a-putting of it on."

The CHAIRMAN, in putting the vote of thanks, said he feared Mr. Whall had not been into the right class of architects' offices when he complained of the want of colour and absence of sketches and specimens of building materials. Mr. Ricardo had the courage of his opinions, and had applied glazed-tile surfaces in broad masses with most successful results. The difficulty with the architect's work was that he was not allowed to try experiments in construction. His early works with all their failures remained in evidence against him as long as the buildings existed, and he had not the opportunity of correcting in after life the mistakes he recognised in his first essays.

Mr. WHALL replied to the vote of thanks, which was carried by acclamation.

#### THE PRESIDENTSHIP OF THE R.I.B.A.

MR. GEORGE AITCHISON, A.R.A., District Surveyor for East Wandsworth and Tooting, has been nominated by the Council of the Royal Institute of British Architects for the Presidency of that body. Without disparaging for a moment the personal characteristics for kindness and culture, to say nothing of the gentlemanly qualifications of the worthy Professor of Architecture at the Royal Academy, we only express the feeling of regret which the choice thus announced must cause among many who have the best interests of the Institute at heart.

It may possibly seem to some ungracious question the wisdom of the Council in this matter but, nevertheless, it must be evident to all who are not personally committed to the official cliquism, which too much prevails in the management at Conduit-street, that a President should be chosen for other reasons than these, and if the chairmanship of the R.I.B.A. is to inspire the general body with a high ideal, and insure an ungrudging loyalty from the profession, the election must be a unanimous one. It is a fact, of course, that Mr. Aitchison designed the late Lord Leighton's house in Holland Park for him, and consequently became an Associate of the Academy; but neither this work nor the Royal Exchange Assurance Offices in Pall Mall, his most prominent buildings, can be quoted as masterpieces in the modern architecture of London. We have been among the foremost to recognise the merit which Mr. Aitchison's decorative designs have at times displayed; but neither these nor his utilitarian warehouses in the Docks, nor his archaeological lectures at the Royal Academy during his term of Professorship, suffice to justify his elevation to the Presidency of the Royal Institute of British Architects, judging from the standard by which alone such a position should be accorded—viz., the candidate's executed designs as a leading architect of distinction. The necessity for thus insisting on these conditions is the more evident now that it has become a by no means uncommon practice of late years for the President of the Institute to accept, and indeed obtain, by virtue of his office, the position of sole professional referee in important architectural competitions, in which, of course, rare qualifications are essential to sound judgment, and consequently satisfactory awards. It may be urged that Mr. Aitchison has often attended the Institute meetings, and done good useful service in the conduct of



its affairs, and we fully recognise his offices in this respect: but he is not a good speaker, his work is not up-to-date in its style, and however familiar he may be with the dates and features of the Arts, we fail to recognise in him those essential qualifications which we have ventured to indicate, and, therefore, we sympathise with those who are expressing their doubts as to the wisdom of the choice which the authorities have made. There are two or three other names which would have been received with acclamation, and either of them would undoubtedly have introduced new vitality into the Institute. As it is, the old ways will be encouraged, and want of success will in all likelihood continue to mark its history. A portrait of Mr. Aitchison appeared in our pages for Jan. 3, 1890, with a list of his appointments.

## CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXII.

By JOSEPH HORNER.

THE method of making the shafts of pattern columns shown in the previous article is not adopted except in the case of those of small diameter, say up to 6in. or 8in. or 9in. If beyond those dimensions, the method of "lagging up" shown in section in Fig. 71 and in succeeding figures is chosen. The number of lagging strips A used in the circle depends chiefly on the diameter of the circle. The larger it is the more numerous should be the strips. Also, the larger the number of strips in a circle—that is, within reasonable limits—the less likely is the pattern to lose its accuracy. The number will range from six to eighteen or twenty in the smallest and largest columns respectively. They will range between 2in. and 3½in. in width. They are glued

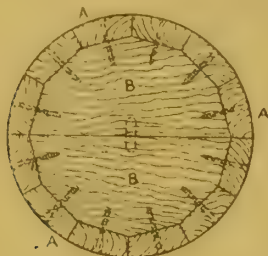


Fig. 71.

edge to edge, and glued and screwed to the cross-bars B, upon which they are built. The latter are placed at intervals of about 12in. apart.

The pattern shown in Figs. 72 and 73, though it apparently involves much work, does not do so actually. It is all very plain from the point of view of pattern-maker and moulder. The same kinds of elementary views are given as in the previous examples, the casting in half-section, the half-plan of pattern, the pattern open in the joint face, and the core-board C.

There are different methods of constructing such patterns as this in detail. Figs. 72 and 73 show what I consider the best. Here the lagging strips A, go the entire length of the pattern, and prints, and flanges, and mouldings are let into grooves turned for their reception in the body or shaft of the pattern. This is illustrated in Fig. 73. The pattern is thus rendered rigid, and shrinkage of timber is minimised. In Fig. 74, two alternative methods are shown, both of which are frequently adopted. In one method, illustrated in the lower part of the figure, the lagged pattern terminates at the end of the shaft proper, at a, and the moulding, and the flange, and the print are screwed one against the other. The objection to this is, that the pattern is not quite so true when made, and does not remain so true as when made as in Fig. 73. It is rather easier, however, to construct.

In the other method, illustrated in the upper part of Fig. 74, the lagging goes on through the print, and the flange is let into the body of the pattern. But the moulding is turned in one with the lagging, blocks being glued upon the latter sufficiently large to hold up to the moulding dimensions. This a very good method, and this, or the one shown in Fig. 73, should be adopted.

The mouldings are usually turned in place upon the shaft—that is, the lagged-up pattern is grooved to receive the blocks intended for the mouldings, which blocks are bored in a separate lathe, inserted, and glued and screwed into their

grooves, and there turned to shape. It is desirable to remove the pattern from the lathe, open it, and screw the moulding blocks from the inside; or, the mouldings may be turned and finished

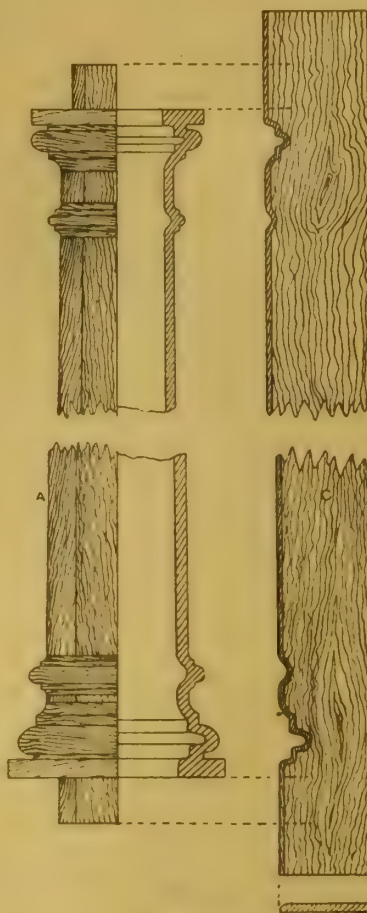


Fig. 72.

separately from the main pattern, and inserted after the final removal of the main body from the lathe, but this is not a good plan.

A lagged-up pattern cannot go much out of truth. A hundred castings might be moulded from it if well made before it would want much repair. I will not spend time in descriptive detail of the way in which the actual work is

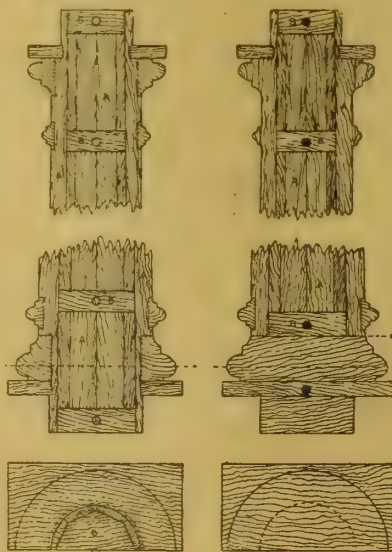


Fig. 73.

Fig. 74.

done, but leave the shaded drawings to be self-explanatory.

The taper or draught necessary for delivery calls for no special remark in such work as this. The sections of the half-pattern, being semi-circular, are most favourable to delivery. The

only portions which are likely to withdraw badly are the square flanges. These should, therefore, be thinned or tapered slightly downwards in a direction away from the joint faces of the pattern. A little taper should also be given at the roots of the mouldings adjacent to the flanges. A shrinkage allowance of ¼ in. on 2ft. 6in. must be made and added to patterns.

When two or three large columns are required, and no more, then a pattern is costly, and a loam pattern is used. Say the column in Fig. 72 were required; then the loam board for the pattern would be of the shape shown in Fig. 75, which, it will be seen, is nothing but a former, against the edge of which the loam is "struck" or swept up on an iron bar, set to the correct radius, to the contour of the column body. This is dried and moulded from. The square flanges, which, of course, cannot be struck, are prepared in wood, and fitted over the ends of the loam pattern in their correct positions indicated on the board at a, a. Fig. 76 shows the loam pattern with its flanges. The core-board is precisely the same as in Fig. 72, C. If a large number of castings are required from even a large column, it does not pay then to use a loam pattern. And in any case, a higher price would be charged at a foundry



Fig. 75.



Fig. 76.

for making and moulding from a loam pattern, than if a wooden pattern were supplied, so that before deciding which to use, it is necessary to ascertain the relative cost of each method by obtaining quotations.

In the columns now illustrated, there is no difficulty on the score of delivery from the sand. Everything delivers freely. But the case is different when there are bracketed flanges, or ornamented capitals, or flutes. In these cases some portions have to be made so that they will be left behind in the sand, after the withdrawal of the main body of the pattern from the mould. The consideration of these will occupy our attention in the next article.

## NOTES ON DOMESTIC DRAINAGE.—XII.

FLUSHING AND WATER-WASTE PREVENTING CISTERNS.

THE water necessary for sanitary purposes must be kept entirely distinct from that required for general domestic uses. The supply to closets, slop-sinks, &c., should, therefore, never be taken direct from a service-pipe or cistern which is used for any other purpose. In addition, the overflow from all storage or other cisterns must discharge into the open air away from any soil or



ventilating pipe in connection with the drains, so that the water supply may not be contaminated either directly or indirectly with sewage or any impure gases arising from such matters.

Most water companies insist on what is known as a water-waste preventing cistern being fixed to all closets or other sanitary appliances requiring a water-flushing arrangement. This is to insure an economical expenditure of water, and consists of a small cistern capable of containing and supplying a limited quantity of water sufficient for one flushing operation. Where water-waste preventing cisterns are provided, the sanitary requirements of the case are also at the same time complied with, by the water supply to the fitment being at this point disconnected from the general domestic supply.

Flushing-cisterns, or water-waste preventers vary in comparison from one gallon upwards; but, as a rule, water companies will not permit the use of a water-closet waste-preventing cistern in which the consumption of water is greater than two gallons for each flush, and in some cases will only allow certain specified and approved types of flushing-cistern or water-waste preventer to be used. Generally, it may be said that two gallons of water is quite inadequate for the proper water-carriage or removal of faecal matters from the soil-pipes and drains into the public sewer, whilst the minimum size of the soil-pipe and drain is fixed at  $\frac{1}{4}$  in. diameter. The consequence is that the greater portion of the faeces remain within the house-drains, in a more or less advanced state of decomposition, until such time as they may be removed by successive volumes of flowing sewage or water. The Sanitary Institute, from the results of some experiments recently carried out, recommended that a minimum of three gallons, and a maximum of three and a-half gallons should be

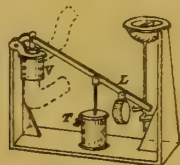


FIG. 60.

allowed for water-closet flushing purposes. Where circumstances permit, a three-gallon flush should be given to all water-closets, and a two-gallon flush to housemaids' slop-sinks.

Water-waste preventers or flushing-cisterns to closets and slop-sinks are generally so arranged that on pulling or lifting a handle the water in the cistern is rapidly discharged by siphonic action into the basin below, the fitment being thoroughly cleansed, and the contents removed by the powerful flush thus obtained.

A water-waste preventer of a good type should flush properly when the handle is gently pulled, and the discharge should be rapid and certain, whether the handle is held during the whole period of discharge or not. For this reason it should be valveless, the cistern being emptied by siphonic action. The angles should be rounded, and the sides slightly sloped, so that it may not be fractured by frost. The supply-pipe from the water-waste preventer to a closet of the wash-down form, should be of strong  $\frac{1}{4}$  in. diam. lead pipe, the upper end being soldered to the brass union outlet of the waste-preventer. The lower end of the pipe should be secured to the flushing-arm of the closet by means of a strong india-rubber cone properly bound with strong copper wire, as shown in Fig. 58. A single flush given to slop-sinks and closets of the wash-down type should be all that is necessary to remove the contents of the basin, and recharge the trap with perfectly clean water.

With regard to *valve-closets*, the ordinary single-flush water-waste preventer is unsuitable, for if the valve be unwittingly kept open too long the whole of the water in the waste-preventer cistern is discharged, and none remains to fill the closet basin when the valve is closed.

In cases where a water-waste preventer must be used with a valve-closet, it should be of the description known as an *after-flush water-waste preventing cistern*. This is designed to give both a *flush* and distinct *after-flush* to the basin, and must be so arranged that if the handle of the closet is held up, and the valve under the basin kept open until the first flush ceases; the second, or *after-flush*, will not flow into the basin until

the handle is released and the valve closed, so that the basin may be left with a proper depth of water therein.

The usual method of flushing valve-closets in places where water-waste preventing cisterns are not compulsory is to fix a small cistern (disconnected from the remainder of the domestic water

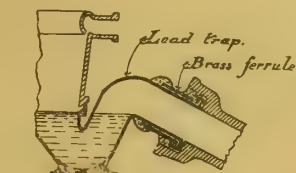


FIG. 61.

supply) overhead, and supply the closet therefrom by means of a *supply valve and bellows regulator* fixed under the seat. A sketch of such an arrangement is given in Fig. 60; but the closet-basin and trap are omitted for the sake of clearness. On lifting the handle, the closet-valve and the water-supply valve V are both opened, and water is admitted to the basin so long as the handle remains raised. On releasing the handle, the closet-valve is immediately closed, whilst at the same time the water-supply valve is also being gradually closed by means of the weighted lever L attached to the supply-valve and the bellows regulator. The rate of descent of the lever L may be regulated by means of the tap T, which allows the air within the air cylinder or bellows regulator to escape at any desired speed. Accordingly, as the air is permitted to escape either slowly or quickly from the regulator, so will the lever descend, the water-supply valve being closed at a corresponding rate, and the volume of water delivered into the basin after the closet-valve is closed will be proportionately determined.

The size of the water-supply pipe and valve will depend upon the head of water available. The following sizes will afford a good flush where the cistern is fixed above the closet at the heights mentioned, viz. :—

Head of water available, or height of cistern above closet.	Internal diam. of supply pipe to valve.	Internal diam. of supply valve.
2ft. ....	2in. ....	2in.
4ft. ....	2in. ....	1½in.
8ft. ....	1½in. ....	1½in.
12ft. ....	1½in. ....	1½in.

All cisterns should be provided with an overflow pipe discharging into the open air. The sizes and descriptions of flushing cisterns required for flushing branch and main drains have already been mentioned. For urinals where a constant flush cannot be given, a one-gallon automatic flushing cistern discharging at frequent intervals should be provided.

#### WATER-CLOSET CONNECTIONS.

In addition to the provision of a satisfactory form of water-closet, it must be remembered that the sanitary efficiency of the fitment will depend in a great measure on the proper fixing of it, and on the character of the joint between the closet-trap and the soil-pipe. The consideration of the form of closet connection to the soil-pipe may appear to be of minor importance, and, unfortunately, is too often neglected in practice; but it is essential that the greatest care shall be

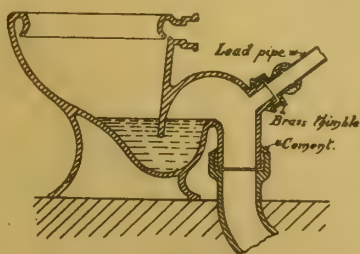


FIG. 62.

exercised in securing a permanently satisfactory joint at this point. The drains and soil-pipe may be properly constructed in every respect, the closet appliance may be the best of its kind and well adapted for the purpose for which it is intended, yet, if the water closet be fixed in a

slovenly manner or imperfectly connected, the use of it may be absolutely dangerous to health.

It is, therefore, most necessary that the connection made between the closet-trap and soil-pipe on the drain side of the trap shall be perfectly air and watertight, and altogether above suspicion; otherwise there is great risk of the vitiated air from the drains escaping through the defective joint into the building. When the connection is between materials of the same description, as lead and lead, stoneware and stoneware, &c., the joint is, or should be, easily and securely made; but when it is required to connect two different materials, as stoneware to lead, stoneware to iron, or *vice versa*, lead to stoneware, or iron to stoneware, the formation of a proper joint at this point is rendered somewhat difficult.

Where valve closets are used, the trap under the closet should invariably be of lead, the connection to the lead soil-pipe being made with the usual wiped solder joint. The connection between a lead trap and an iron soil-pipe must be effected by means of a strong brass ferrule, secured to the outlet of the lead trap with a wiped joint, as shown in Fig. 61. The lead is dressed over the other end of the ferrule and inserted in the socket of the iron soil-pipe, the joint being then run with lead and calked in the usual manner. Should it be necessary to connect the lead trap with a stoneware drain or soil-pipe, the joint is made in exactly the same way as just described (see Fig. 61), except that neat Portland cement is substituted for the molten lead.

When the outlet of the trap is of earthenware and the soil-pipe of lead, the joint should be made with a brass socket or thimble, as shown in Fig. 58. The thimble is soldered to the soil-pipe, the outlet

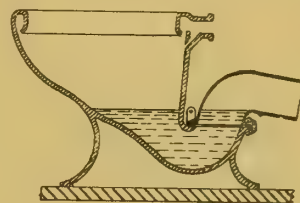


FIG. 63.

of the trap being then inserted into the brass socket, and the joint made with neat Portland cement. Where the outlet of the trap is of earthenware and the soil-pipe of iron or stoneware, the end of the trap must be inserted into a socket on the soil-pipe itself, and the joint made good with neat cement, as shown in Fig. 62.

In cases where the trap outlet is of iron and the soil-pipe of stoneware, the end of the trap must be placed in the socket of the soil-pipe, and the joint made with cement. When both are of iron, the joint would, of course, be run with lead and calked.

All the above-mentioned joints, when properly made as described, will be found to comply with the requirements of the by-laws of the London County Council.

The joint between the anti-siphonage pipe and the closet-trap requires to be just as carefully made as that between the closet-trap and soil-pipe, and should be carried out in the same manner in all its details. Fig. 62 shows the connection between a stoneware closet-trap and a lead anti-siphonage pipe, the joint being made by means of a brass thimble soldered to the lead pipe.

Owing to the difficulty of making a satisfactory joint with Portland cement between the earthenware trap of the ordinary flush-down closet and an iron or lead soil-pipe, various special forms of joint have been devised, of which a few types will be briefly mentioned here.

Fig. 63 is a sketch of a well-known wash-down closet, in which the connection between the stoneware and lead is so arranged as to be below the water-level of the closet-trap, the joint being secured by means of an iron collar, which is capable of being tightened up with small screw-bolts. Being thus permanently submerged, any defect at this connection would immediately become apparent. The lead outlet can accordingly be connected to a lead soil-pipe by means of the usual wiped joint.

Another type of joint recently introduced consists in soldering the lead pipe directly to earthenware by means of a special flux or soldering material, so that a thorough incorporation of the



two materials is effected at the junction, and a satisfactory air and water-tight joint obtained. Fig. 64 shows a well-known form of this joint, in which the closet is sent from the manufacturers with a lead socket securely attached to the outlet of the earthenware trap with a patent soldered joint. Each of these joints is tested to withstand a pressure of 45ft. head of water before being sent out. A wiped joint readily secures the socket to a lead soil-pipe or branch. In another patent joint of similar character the outlet of the earthenware trap is coated with some material which admits of being readily tinned, so that when being fixed, a wiped lead joint may be made directly between the earthenware of the closet and the lead soil-pipe. It is stated that

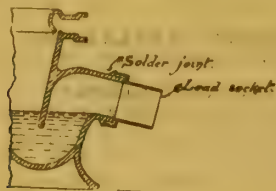


FIG. 64.

when joints are made in this manner, if subjected to great hydraulic pressure, the ware itself would give way rather than the joint.

The connection between the soil-pipe and the trap of any wash-down form of closet should always be accessible for examination. Closets having the outlet of the trap formed as shown in Fig. 57 should not be used, for this reason. The efficacy of such a joint entirely depends on the perfect bedding and jointing of the closet-base upon the end of the soil-pipe, and it is very seldom that a thoroughly air-tight joint can be formed in this manner. On the least disturbance of the closet fitting the joint may be broken, and the damage remain unseen and undiscovered until serious consequences to health have been caused by the free entrance of vitiated air from the soil-pipe into the apartment through the defective connection.

The outlets of all closet-traps should preferably be of the P form, as shown in Figs. 58, 61, 63, &c. Where it is necessary to use the S form of outlet, the joint between the soil-pipe and the outlet should be above the floor-level, as shown in Fig. 62, so that the whole of the joint may be visible and accessible at all times.

## THE BUILDING TRADES EXHIBITION, MANCHESTER.

THIS Exhibition was opened on Monday at St. James's Hall, Manchester, by Mr. John Holden, F.R.I.B.A., the president of the Manchester Society of Architects, and bids fair to be a successful show. The management, under the able direction of Mr. A. P. Baker, F.R.C.I., M.S.A., are to be congratulated on having achieved an unusual result at exhibitions—that of having all their exhibits in order at the opening ceremony, thus enabling the earliest visitors to notice the many novelties and contrivances on view. It is impossible for us to devote space to all the exhibits; but among the principal ones, taking them in the order of the catalogue, are Stand 23-27a, where Mr. C. H. Sidebotham exhibits Messrs. Banks' patent fireproof method of constructing floors and partitions, and also samples of various lenses for pavement lights, self-locking coal-grids and stable fittings, manufactured by the St. Pancras Iron Co.

At Stand No. 30, the Cameo Woodworking Co. have an interesting exhibition of the latest method of treating wood for decorations, showing a handsome ornamental mantelpiece composed of cameo panels, several screens of similar workmanship, and patterns of various mouldings, &c. The next stand is that of Messrs. Messenger and Co., who exhibit a section of a greenhouse, with the iron stage, ventilating gear, and other fittings, and the Loughborough boiler. At Stand No. 32 is a working rain-separator exhibition, by Mr. C. Guy Roberts, the usefulness of which we have descanted upon on many previous occasions. Mr. H. Bassant shows several specimens of his patent parquet flooring, impressing upon his clients the fact that the same is of English manufacture. At Stands 54, 55, and 56, Messrs. Doulton and Co. have a comprehensive exhibit of white glazed

sanitary pottery, including school lavatories, sinks, baths, &c.; they have also on view their patent Metallo-Keramic joint which insures an absolutely sewer-gas-tight joint. Mr. G. Mansell, at Stands 74 and 75, exhibits Messrs. Hayward Bros. and Eckstein's well known semi-prism pavement lights, Messrs. Francis and Co.'s shutters, and Mr. Henry Hope's metal casements, eclipse door-checks and spring. At Stand No. 87 the Yost Typewriter Co. have working one of their latest pattern typewriters, known as the No. 4. It takes any size of paper up to 9½ in. in width, and writes a line 7½ in. long, and provides 78 characters.

Messrs. Duckett and Son have a large exhibit at Stand 89 of their patents, including latrines for schools, factories, &c., a 10-gallon tank, fitted for automatic flushing with patent apparatus consisting of copper tipper and dead-weight valve (these fittings are prepared suitable for tanks of any capacity, either for underground or overhead use), and two forms of slopwater closets, which may be flushed automatically with slopwater or any waste water usually made about the dwelling. A self-cleansing channel gully, constructed to meet the recommendation in the model by-laws of the Local Government Board: an improved form of clean-water closet, the "Whirlpool"; and a variety of loose exhibits, including street gullies, &c.

At stand No. 97 is shown McMath's patent wash-hand trough for schools, orphanages, and other public institutions, perfect in its utility; universally acknowledged to be the most cleanly and economic wash-hand trough yet introduced in board schools. It has been adopted by the Glasgow School Board and many others throughout the United Kingdom for its many advantages, which are:—(1) From its simplicity of construction, which occupies but very little space; (2) from its facility for enabling 200 children to wash their hands in fifteen minutes, and the water being always clear; (3) from its durability, from its being built of solid marble, slate, or iron. It is manufactured by Messrs. Emley and Sons, of Newcastle.

Messrs. Joshua W. Taylor, Limited, exhibit at stand No. 99 four of their patent Rational fireplaces. One is shown with tawny brown briquettes, and tiled hearth to match, and painted pine mantel; and another with copper and iron interior, tiled cheeks and hearth to match, mantel in carved fumigated oak, oak fender lined with copper, the effect being most artistic.

At stand No. 78 the Loco. Draining Apparatus Co., Limited, have an interesting exhibit of Mr. F. C. Lynde's improved sanitary draining apparatus, which undoubtedly possesses great advantages over the ordinary bend.

Stands Nos. 81 and 82 claim a large share of attention on account of the process of slate-splitting and dressing, which is carried on daily by the Oakeley Slate Quarries Co., Limited.

Another exhibit which we have recently noticed is the clever imitation of marble applied to columns, tables, and chimney-pieces, and manufactured by the Plastic Marble Co.

The architectural designs and drawings, of which there are about 150, are hung in a separate gallery, which is rather a disadvantage. They are, for the most part, works of local architects, and the fact that another architectural exhibition is on view in the city renders this one hardly representative of local ability. Taking the drawings in catalogue order, Messrs. H. Goldsmith and Son send 16 drawings, principally of the cheaper kind of villas, although that of Stapleton Towers appears to represent extensive additions to an old Baronial castle of the "Border" type, and is picturesque. Mr. J. Langham sends, besides several drawings of old work, houses at Bearsted, Swinton, and Prestwich—the latter we hope to publish shortly. Mr. J. W. Beaumont is represented by his Town Hall, Colne, and two other works. Messrs. Woodhouse and Willoughby have no less than eighteen drawings, a large proportion being designs for board schools and technical schools, their Salford School Board Offices and Winsford Technical Schools being, perhaps, the most noteworthy. Messrs. Heathcote and Rawle send their offices in Piccadilly, Manchester, erected on a narrow strip of land, which doubtless has much to do with the awkward appearance of the building, and houses at Buxton and Higher Broughton. Mention should be made of a drawing of some interest exhibited by Mr. John Holden, made in 1848, for the reconstruction of the "old church," Manchester;—it has, of course,

never been fulfilled. Messrs. Darbyshire and Smith send nineteen exhibits, including several powerful water-colour drawings of their "Old Manchester" at the Jubilee exhibition. Mr. Edgar Wood sends some interior and exterior views of houses which would not be remarkable were it not for the studied affectation of the drawing, which is after the manner of Mr. A. B. Pite—or Albert Dürer, if you please. His design for a common table is rather pretty. Mr. F. H. Oldham is represented by a water-colour drawing showing a design for Municipal Buildings, Darlington, a good composition in English Renaissance, quiet and appropriate in character. There are several excellent drawings and designs by Mr. Maurice B. Adams; that from the Palace at Saragossa being, perhaps, the most striking. Messrs. Booth and Chadwick contribute their Stephen's Buildings, Market-street, Manchester, and several water-colours of merit. Mr. John Brooke is represented by several large houses, notably one at Bowdon, Cheshire—a quiet composition that looks like the home of an English gentleman.

## CHIPS.

The Bishop of Gloucester and Bristol performed the ceremony, on Saturday, of reopening Rodborough Church after restoration. The chancel has been enlarged, a new vestry and organ-chamber built, and the south aisle extended. The other changes include new seats, wood-block flooring of the nave, and redecoration. The cost of the work has been about £2,100.

At a meeting held at Chesterfield last week, it was decided to take steps for the restoration of the parish church and its famous crooked spire, at an estimated cost of £12,000.

Mr. Justice Wills on Saturday gave judgment in the litigation brought by the Incandescent Gas Light Company for an infringement of their patents. He held that the De Mare Incandescent Gas Light System, Limited, had infringed the plaintiffs' patents, and granted an injunction against them; but in the case of the Sunlight Incandescent Gas Lamp Company judgment was given in favour of the defendants, on the ground that their process of producing the illuminants was different from that of the plaintiffs.

At a vestry meeting held at Runcorn last week, plans were adopted for a district church to be erected at Weston. Towards the estimated cost, £2,300, exclusive of tower and site, the committee have in hand £1,700.

The John Knox Church, Bewick-street, Newcastle, is at present being pulled down to make way for a large temperance hotel, which is to be erected on its site, and also a number of shops. The church was erected in the year 1854, and the congregation have gone to a new church at the corner of Beechgrove and Elwick-lane, erected from designs by Mr. W. Lister Newcombe, of Pilgrim-street, Newcastle. The architects for the erection of the new hotel and adjoining premises are Messrs. Oliver and Leeson, of Mosley-street, Newcastle.

The highways committee of the Leeds Corporation have appointed Dr. Hopkinson as engineer of the electrical tramway from Kirkstall to Roundhay, terms satisfactory to the committee having been arranged. Dr. Hopkinson will take the full responsibility of the equipment, and he has been instructed to prepare the necessary specifications. Mr. Hewson, the city engineer, has also been instructed to prepare plans for the power station to be built near Crown Point.

A parish-room, erected as an adjunct to St. Martin's Welsh Church, Chester, was opened on Wednesday week. It has been built by Messrs. Bird from plans by Mr. H. Beswick, architect, of Chester.

Mr. W. Santo Crimp, C.E., has been appointed, at a fee of fifty guineas, as assessor on the fourteen competitive schemes for the disposal of the sewage of Rugeley in response to premiums offered by the urban district council of that town.

The Bishop of Shrewsbury dedicated on Sunday a new pulpit that has been erected at St. James's, Handsworth. The pulpit was designed by Mr. J. A. Chatwin, of Birmingham, and the work has been carried out by Mr. R. Bridgeman, of Lichfield. It is built of veined polished alabaster, in the Decorated style. The plan is decagonal, the interior of the upper portion being circular. The compartments contain five modelled figure panels, all in white alabaster. The subjects illustrated are "St. John the Baptist Preaching," "Our Lord's Sermon on the Mount," "The Good Samaritan," "The Prodigal Son," and "Our Lord Washing His Disciples' Feet." These panels are each divided by moulded and clustered shafts springing from carved corbels, and surmounted by a moulded and embattled cornice. The inside of the pulpit is lined with oak.



## CONTENTS.

Quantities and Contracts .....	589
Overlapping .....	590
Water-Colour Drawings at the Guildhall .....	591
The Society of Architects .....	591
Royal Institute of British Architects .....	594
The Presidentship of the R.I.B.A. ....	595
Cast-Iron in Builder's and Contractor's Work.	
XII.	596
Notes on Domestic Drainage.—XII.	596
The Building Trades Exhibitions, Manchester	598
The Building News Directory .....	599
Our Illustrations .....	599
Methodist New Connexion Chapel and School, Out-	
lane, Huddersfield .....	600
Building Intelligence .....	618
Books Received .....	619
Competitions .....	619
Correspondence .....	619
Intercommunication .....	620
Legal .....	620
Legal Intelligence .....	620
Parliamentary Notes .....	621
Water Supply and Sanitary Matters .....	621
Our Office Table .....	622
Meetings for the Ensuing Week .....	623
Trade News .....	623
Tenders .....	623

## ILLUSTRATIONS.

PORTRAITS BY HOLBEIN, FROM WINDSOR CASTLE.—	
RESTAURANT FIREPLACE AT THE HOTEL CECIL.—NEW CO-	
OPERATIVE BUILDINGS, MOTHERWELL, N.B.—ST. MARY'S	
CHURCH, BANBURY.—"THE BUNGALOW," KENILWORTH.—	
NEW METHODIST CHAPEL, HUDDERSFIELD.—TABLES AND	
CHAIRS FROM NOTABLE COLLECTIONS.	

## Our Illustrations.

## HOLBEIN'S PORTRAITS FROM WINDSOR CASTLE.

LAST February\* we gave two reproductions, chosen from among these exquisite drawings by Holbein, from Mr. Franz Hanfstaengl's grand volume of "Illustrious Personages of the Court of Henry VIII.,† to which we directed our readers' attention on that occasion as one of the most admirable and perfect examples of fac-simile printing by the aid of photography yet brought before the public. To-day, by the courtesy of the publisher, we are enabled to illustrate two more examples from his volume, to which a brief historical description is attached from the pen of Mr. Richard R. Holmes, F.S.A., the Keeper of the Prints at Windsor Castle. The first of these portraits represents Catherine, fourth wife of Charles Brandon, Duke of Suffolk. The second shows Sir Thomas Elyot, Knight.

## RESTAURANT FIREPLACE IN THE HOTEL CECIL.

THE mantelpiece we illustrate is one of several manufactured by Messrs. Doulton for the suite of rooms known as the "Indian Rooms" in the Hotel Cecil. These comprise the table d'hôte, billiard, and smoking-rooms, and are on the south front overlooking the Embankment gardens. The walls of them are throughout lined with hand-painted tiles of remarkably fine texture, and the iron columns (two of which appear in the view), are encased in moulded, built-up, and glazed earthenware. The room in which this fireplace is fixed is 90ft. by 60ft., and of a height of under 18ft., and it was the character of these proportions which induced the architects to depart from the style adopted elsewhere in the hotel. All the full-sized working drawings, in colour, were prepared by the architects, Messrs. Perry and Reed, of John-street, Adelphi, and, under Sir Henry Doulton—who devoted much personal attention to the business—his assistants, Messrs. Carr and Rix, most faithfully carried out the ideas of the architects both in form and tint. The whole of the wall-surfaces of the restaurant, smoking-room, buffet, and corridors have been covered with hand-painted tiles after the Indian method, in material specially produced for the purpose. The pearly translucence of the enamelled surface, together with its freedom from the high reflection usual to tile work, renders the result highly satisfactory. The ornamental columns and fireplaces have been designed, and the colours purposely produced, to follow the treatments suggested by the Emperor Akbar's Palace at

Futteypore-Sikri. Many of these are very fine examples of the ceramic art, owing to the great size of the blocks and the ingenuity of construction. The whole of the tiling is key-backed by the new patent method, thus giving an absolute cohesion to the cement, which has not hitherto been possible.

## CO-OPERATIVE BUILDINGS, MOTHERWELL, N.B.

THESE buildings have been erected by Dalziel Co-operative Society, Ltd. The walls are built of red sandstone from Dumfries. The premises are fitted throughout with all the latest appliances suitable for carrying on the large business of this successful society. The buildings are lighted by the electric light. The architect is Mr. Alex. Cullen, F.S.A.Scot., Hamilton and Motherwell.

## ST. MARY'S CHURCH, BANBURY, OXON: NATIONAL SILVER MEDAL DRAWINGS.

IN 1790 a handsome Gothic church, which stood on the same site as the present edifice, was taken down by Act of Parliament, having been pronounced unsafe, and the present building was erected and opened for divine service in 1797. The tower and portico were, however, not finished until 1822. The building was designed by Mr. Robert Cockerill. It is 90ft. square within, exclusive of the chancel, which is 28ft. long by 26ft. wide. A gallery 18ft. wide originally extended completely round the nave. The church is estimated to seat 2,300 persons. The tower rises to the height of 133ft. In 1858 the eastern gallery which blocked the chancel arch was removed, and the organ, formerly located there, was brought down and placed on either side of the entrance to the chancel. In 1860 it was decided to permanently decorate the interior of the church, till then only whitewashed, and the windows being glazed with plain frosted glass. Sir Arthur Blomfield, A.R.A., was the architect consulted. Under his direction the square nave was improved and richly decorated, the work being commenced in 1864. The whole of this work was carried out by the firm of Messrs. Heaton, Butler, and Bayne, of London. In 1873 the chancel was further improved, under Sir Arthur Blomfield's direction, by having the old chancel arch removed, and the roof raised to the same level as that of the nave, and by building an apse inside the walls at the east end. The organ was again moved and placed in its present position in a chamber on the north side of the chancel. The decorating of the chancel was then carried out by the same firm, who also designed and stained all the windows in the church. These interior improvements were finally completed in the year 1876. We gave a double-page plate on Nov. 25th, 1887, illustrating the decorations of the building, and to-day we publish the measured drawings of the church, for which Mr. J. T. Walker, of Banbury, was awarded a National Silver Medal at the last Students' Works Competition, held at South Kensington. The church is a particularly interesting example of its period, and has, we believe, never before been thus illustrated.

## "THE BUNGALOW," KENILWORTH.

THE site selected for this residence for Mrs. Whittindale is one of the most picturesque spots in the vicinity of Kenilworth Castle. Standing on an eminence, the views obtained are very beautiful, looking across the castle and grounds on one side, and down on to the abbey ruins in the valley on the other side. Towards the east there is a grove of pine-trees, which forms a background to the building. The bungalow is built of heavy timber framing and solid brick walls throughout, the roofs being tiled. The accommodation comprises, in the basement, heating-chamber, coal and wood stores, larders, wine-cellar, &c. On the ground floor, the hall and dining-room are separated from one another by a movable screen, so that they may be thrown together, thus forming a room 38ft. by 20ft., with open fireplaces fitted with dog grates and with moulded ceilings and oak panelled dados. The drawing-room is 24ft. by 20ft., exclusive of the large bay. Good kitchens, larders, cloak-room, pantries, &c., are also provided. Shut off from the hall by a swing door is the corridor leading to four bedrooms, a bath-room and lavatory, &c., and door leading on to the verandah which runs around the front of the bungalow, with steps. The floors on the ground floor are raised some 5ft. from the ground level. The rooms on the first floor are a sitting-room, a billiard-room, box-room, cistern-room, dark-

room, and two bedrooms. The whole of the rooms and passages are heated by hot water. The buildings comprise entrance gates and lodge, and stabling for four horses, &c. The work has been carried out from the designs and under the superintendence of Mr. De Lacy Ahern, architect, of Colmore-row, Birmingham.

## METHODIST NEW CONNEXION CHAPEL AND SCHOOL, OUTLANE, HUDDERSFIELD.

(For description see next page.)

## TABLES AND CHAIRS FROM NOTABLE COLLECTIONS.

THE Lacquer Table, of which a sketch appears on this illustrated page, is from the collection of the Earl of Elgin and Kincardine. It is incrustated with silver ornaments, and though of Oriental origin, the bow-legs might be a fanciful development of the similar shaped legs common to furniture of the Queen Anne period. They may be compared with the little Side-Table of the latter time shown below, which, together with the 17th-century Circular Arm-Chair, was sketched at Christie's, the two forming part of the effects of the late Sir E. J. Dean Paul, Bart. The High-Back Elbow Chair was sketched at Messrs. Robinson and Fisher's sale rooms, and is a dignified and attractive piece.

## CHIPS.

The town council of Edinburgh accepted at their last meeting the final estimates for the cabling of the tramways in the city, a work which will cost over a quarter of a million, and is expected to be completed in about a year. Messrs. Dick, Kerr, and Co. are the contractors. The council also approved of the terms of agreement entered into with Portobello for the amalgamation of that borough.

Mr. Justice Kekewich decided on Saturday that the London County Council should pay the cost of distribution of £12,000, which had been found to be due to the leaseholders and freeholders around Lincoln's Inn-fields Gardens, which had been taken away from them and thrown open to the public.

Professor Victor Tilgner, the most popular sculptor in Vienna, died suddenly on Friday of heart disease, at the age of fifty-two. His *chef d'œuvre*, the Mozart Monument, opposite the side entrance to the Imperial Opera House, Vienna, was to be unveiled on the following Tuesday, and it is believed that excitement over the event may have aggravated the disease. Tilgner's first important work was a statue of the late gunmaker, Herr Werndl, of Steyr; the second the Mozart Monument, and the third a still unfinished memorial of his late personal friend, the great Vienna painter, Makart.

The Masonic Lodge in Gandy-street, Exeter, which on Christmas Eve, 1894, was to a considerable extent destroyed by fire, was formally reopened on Friday, after having been restored from the designs of Mr. J. Jerman, F.R.I.B.A.

An interesting ceremony was performed on Saturday forenoon in the new Calton tunnel, at Edinburgh. The last brick key was placed in position by Mr. Frank Young, C.E., the resident engineer on the works, on behalf of the North British Railway Company.

In memory of the late Archdeacon Denison, it is proposed to build a church in Taunton, dedicated to All Saints, on a portion of the Flook Estate, at a cost of £60,000, inclusive of endowment. It is suggested that the first £10,000 shall be devoted to the purchase of site, vicarage house with grounds, and endowment.

Lord Windsor, the Mayor of Cardiff, has selected Wednesday next, the 29th inst., for the laying of the foundation and corner stones of the new synagogue at Cardiff, the commission for designing which has been placed with Mr. Delissa Joseph.

Mr. G. E. Hawes, of the Steam Joinery Works, Duke's Palace, Norwich, the contractor for the whole of the works of restoration carried out at St. Peter Mancroft's, Norwich, writes explaining that the last section of the undertaking, just completed, has been executed under the direction of Messrs. Bucknell and Cooper, architects, of Westminster. The upper portion of the great western tower, down to the ringers' floor, was restored by Mr. Hawes from designs by the late Mr. G. E. Street, R.A.

The Metropolitan Asylums Board, at their last meeting, appointed as its surveyor Mr. G. W. Lund, who has for sixteen years been in the service of the Blackburn Corporation. There had been 143 applications for the appointment, which is now created for the first time. A works committee was also nominated to consider, advise, and report to the board on all future building operations. This is a new departure by the board, and has been advocated for years by some of the members.

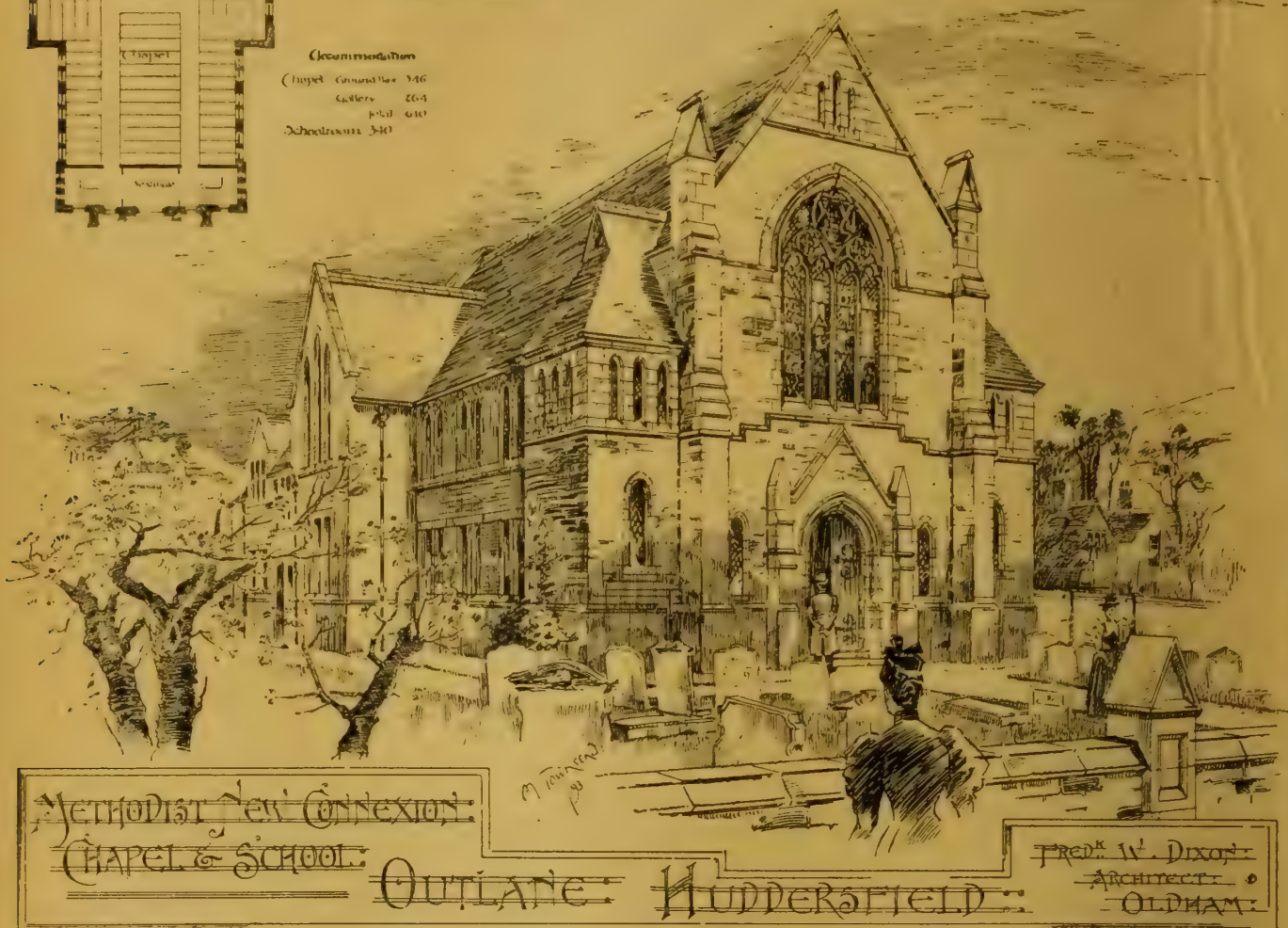
\* BUILDING NEWS, Feb. 21, 1896.

† Portraits of Illustrious Personages of the Court of Henry VIII., reproduced in imitation of the original drawings of Hans Holbein in the collection of Her Majesty. London: Franz Hanfstaengl, 16, Pall Mall, S.W.





Accommodation  
Chapel Grounds 346  
Galleries 264  
Total 610  
Schoolroom 340



# METHODIST NEW CONNEXION CHAPEL AND SCHOOL, OUTLANE, HUDDERSFIELD.

THIS chapel and school have been built to replace a structure nearly a century old, on a very exposed site on the moors, three or four miles out of Huddersfield. The plan was somewhat difficult to arrange in order to avoid the numerous graves found on the site. There are a chapel, with transept and galleries all round, seating 560 persons, and a schoolroom for 350 scholars, with eight vestries. Yorkshire stone was used throughout, and all the woodwork is pitch-pine. The total cost was £2,750. Mr. Fred. W. Dixon, of Manchester and Oldham, was the architect.

An inquiry was held on Friday at the Council House, Bristol, before Colonel A. G. Durnford, R.E., the inspector appointed by the Local Government Board, the corporation having applied to the Local Government Board for approval of the sale of certain corporate lands situated in Herring's-court, Castle-street, Bristol, in the parish of Dursley, Gloucestershire, and in the parish of Portishead. Mr. William Sturge, land steward to the Bristol Corporation, gave the amounts of his valuations of the several properties.

## CHIPS.

A large clock is to be placed in the tower of Cheltenham Training College as a memorial to the late Rev. Principal Chamney. The committee have commissioned Messrs. John Smith and Sons, Derby, to carry out the work.

The partnership heretofore subsisting between George Elkington and George Elkington, jun., architects and surveyors, Cannon-street, E.C., under the style of George Elkington and Son, has been dissolved.

Mr. Arthur Ellis, who was promoted to be electrical engineer to the Southport Corporation at a salary of £208 while the works were in progress, has been appointed electrical engineer at Bolton at £300 salary.

The Llanidloes Town Council have adopted a report by their town improvements committee recommending that a premium of fifty guineas be offered to engineers who would supply them with the best scheme of water supply for sanitary and domestic purposes, together with an estimated cost.

As a portion of the scheme for the better defence of London, a stretch of some five acres on the summit of Boxhill has been shorn by Royal Engineers of its trees and verdure to make way for a new fort. Similar defences have already been erected at Guildford and Reigate.

A new Wesleyan church, Gothic in style, erected with tower and spire, at a cost of over £12,000, was, on Wednesday week, opened at Cheetham Hill, Manchester, by the president of the conference, Dr. Waller.

A new eight-turret clock, striking the hours and quarter-chimes, has been placed in the tower of Grinton Church, Swaledale, Yorks, the work having been carried out by Messrs. Wm. Potts and Sons, clock manufacturers, Leeds and Newcastle.

Mr. Tomlinson, who has just tendered his resignation of the post of water engineer to the municipality of Bombay after ten years' service, has been awarded a pension of 10,000 rupees.

The report of the Warwickshire Clayworkers' Association, presented at a well-attended meeting held at Glascoate last week, states that the number of members is steadily increasing, and the committee cannot but feel pleased with the standing and prospects of the association. Started at Glascoate only a short time ago, the central idea being to bring all the clayworkers in Warwickshire into one strong union, wherever the objects of the association have been explained the thing is taken up with wide approval.

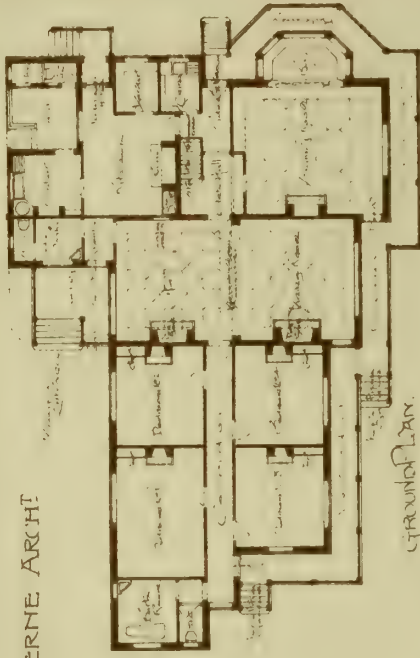
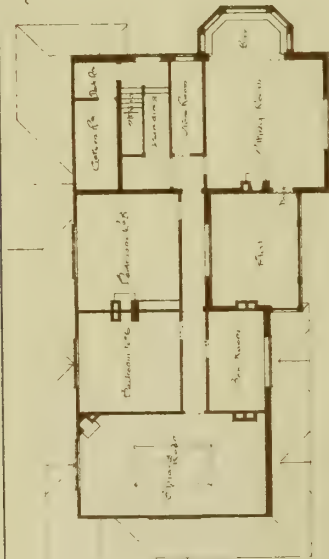
In connection with the scheme for the extension of the north end of the landing-stage at Liverpool, the Mersey Docks and Harbour Board have accepted a tender for the construction of a bridge to connect the stage with the new jetty.







THE BUNGALOW · KENILWORTH · W DE LACY-AHERNE ARCHT





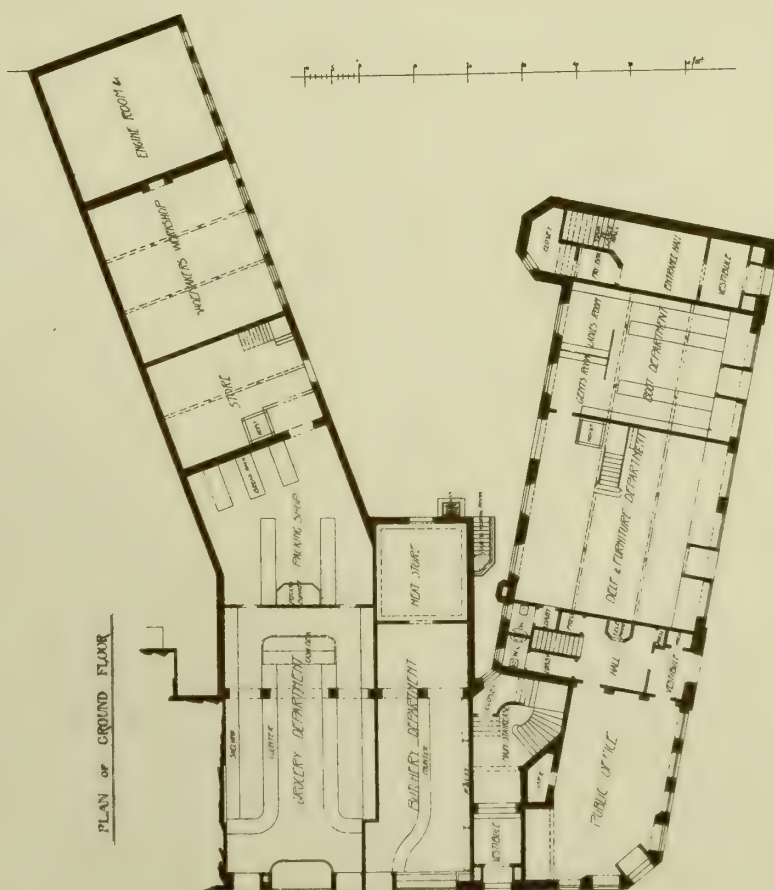








A sepia-toned sketch of a grand, multi-story building with classical architectural features, including arched windows and a prominent cornice. The building is situated on a waterfront, with a body of water in the foreground and a distant shoreline visible. Several figures are standing near the base of the building, and a small boat is visible in the water. The sketch is signed "J. H. Green" in the bottom left corner.













# The Dutchess of Suffolk





APRIL 24. 1896.

HOLBEIN'S PORTRAITS FROM WINDSOR CASTLE.

III:1 Hot Knight



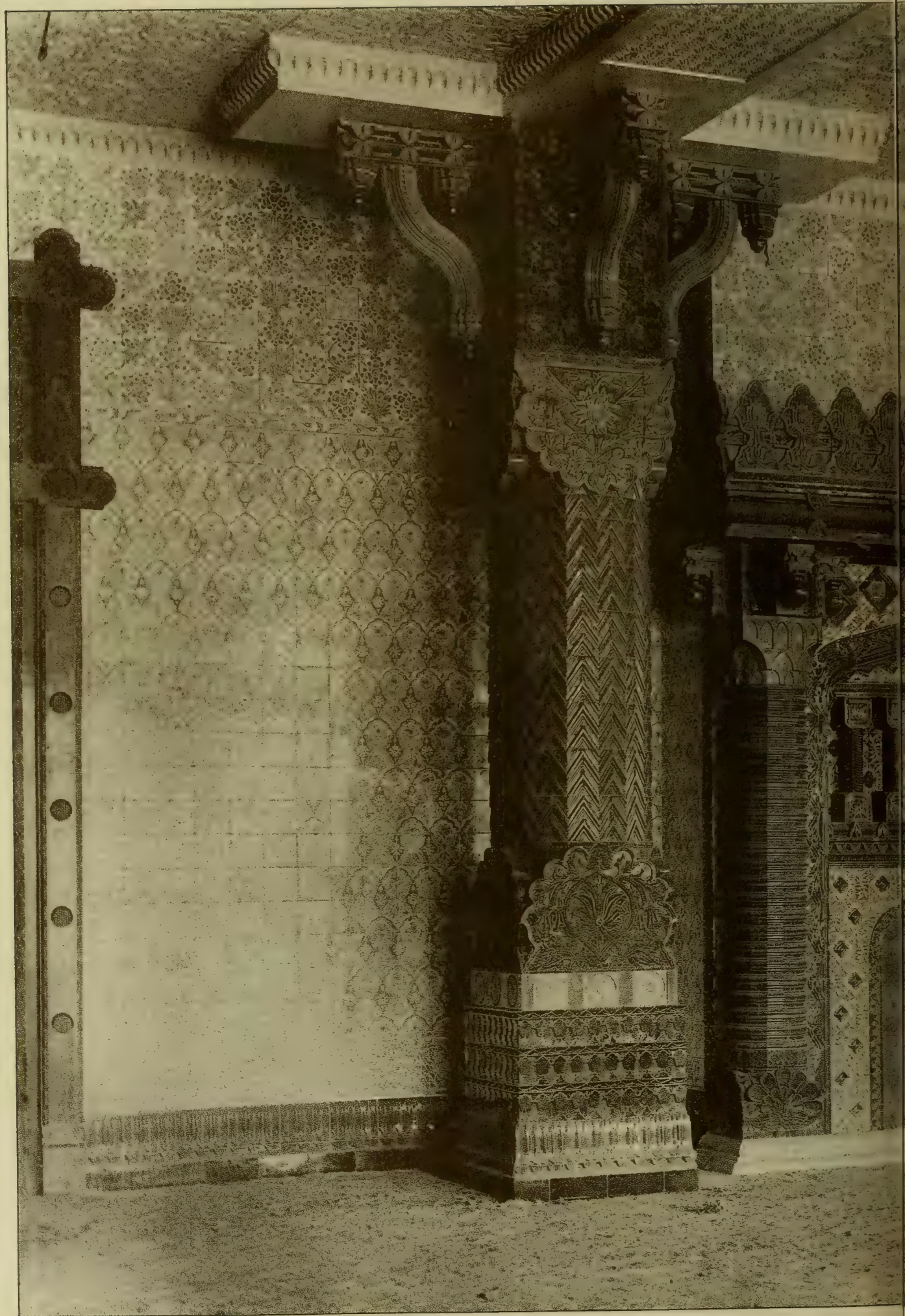












RESTAURANT · FIREPLACE · HOTEL CECIL · LOS ANGELES



S. APRIL 24. 1896.

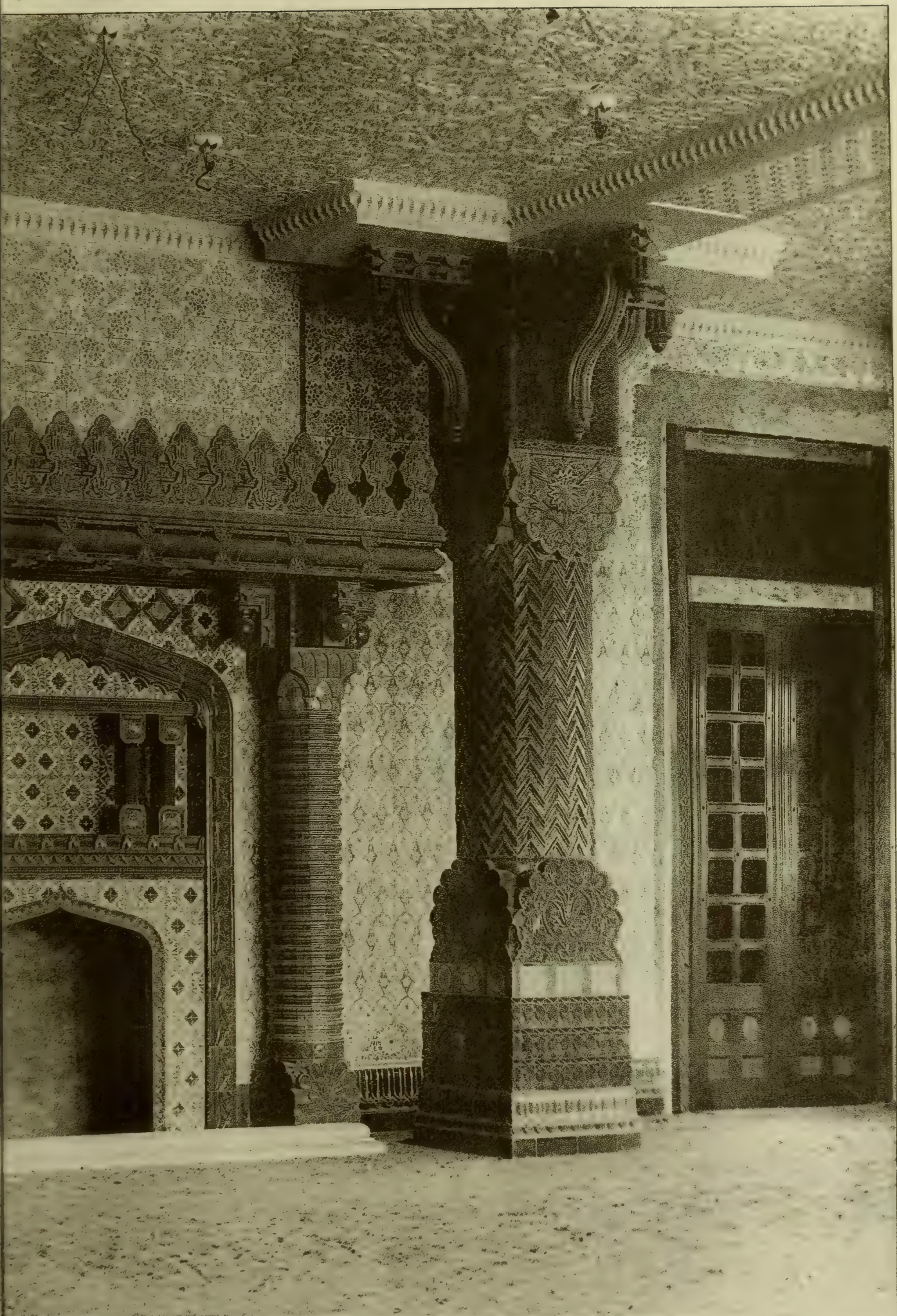


PHOTO-TINT by James Axerinan & Co. Queen Square London W.

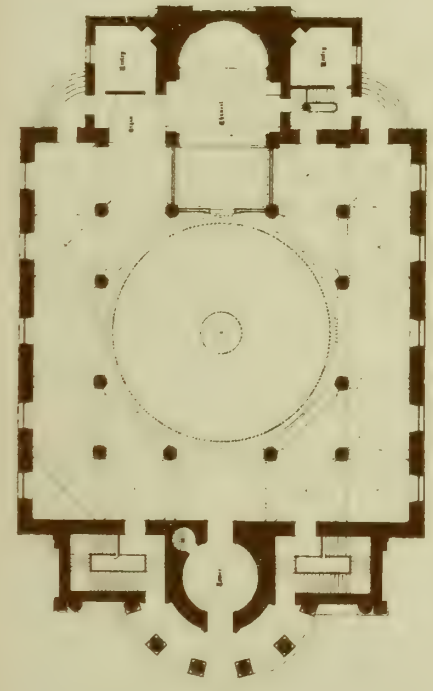
WORK EXECUTED BY MESSRS DOULTON & CO. MESSRS PERRY & REED ARCHTS





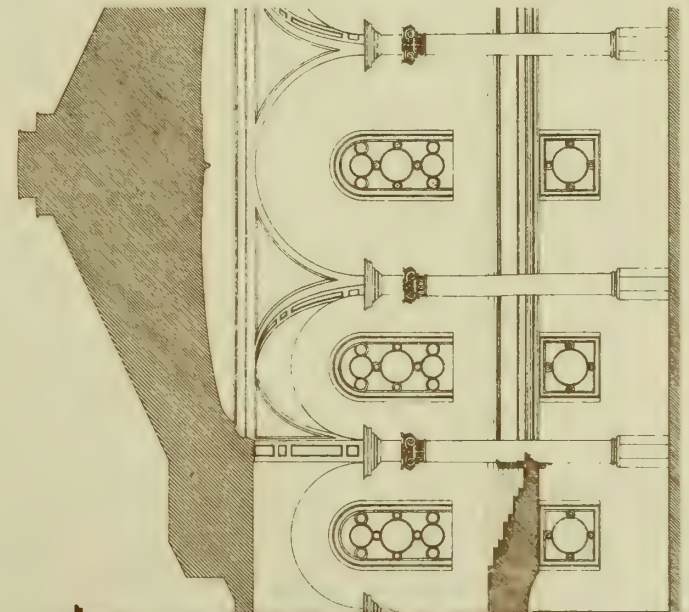


MEASURED DRAWINGS  
BY J.F. WALKER  
NATIONAL SILVER MEDAL  
AWARDED.



PLAN

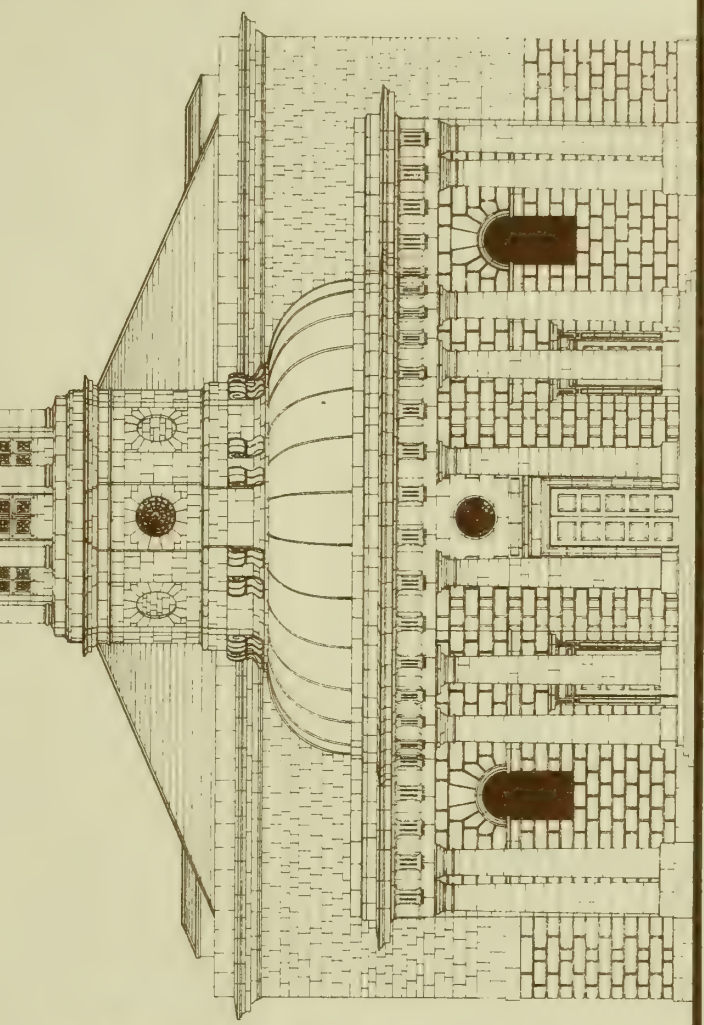
Scale of Feet  
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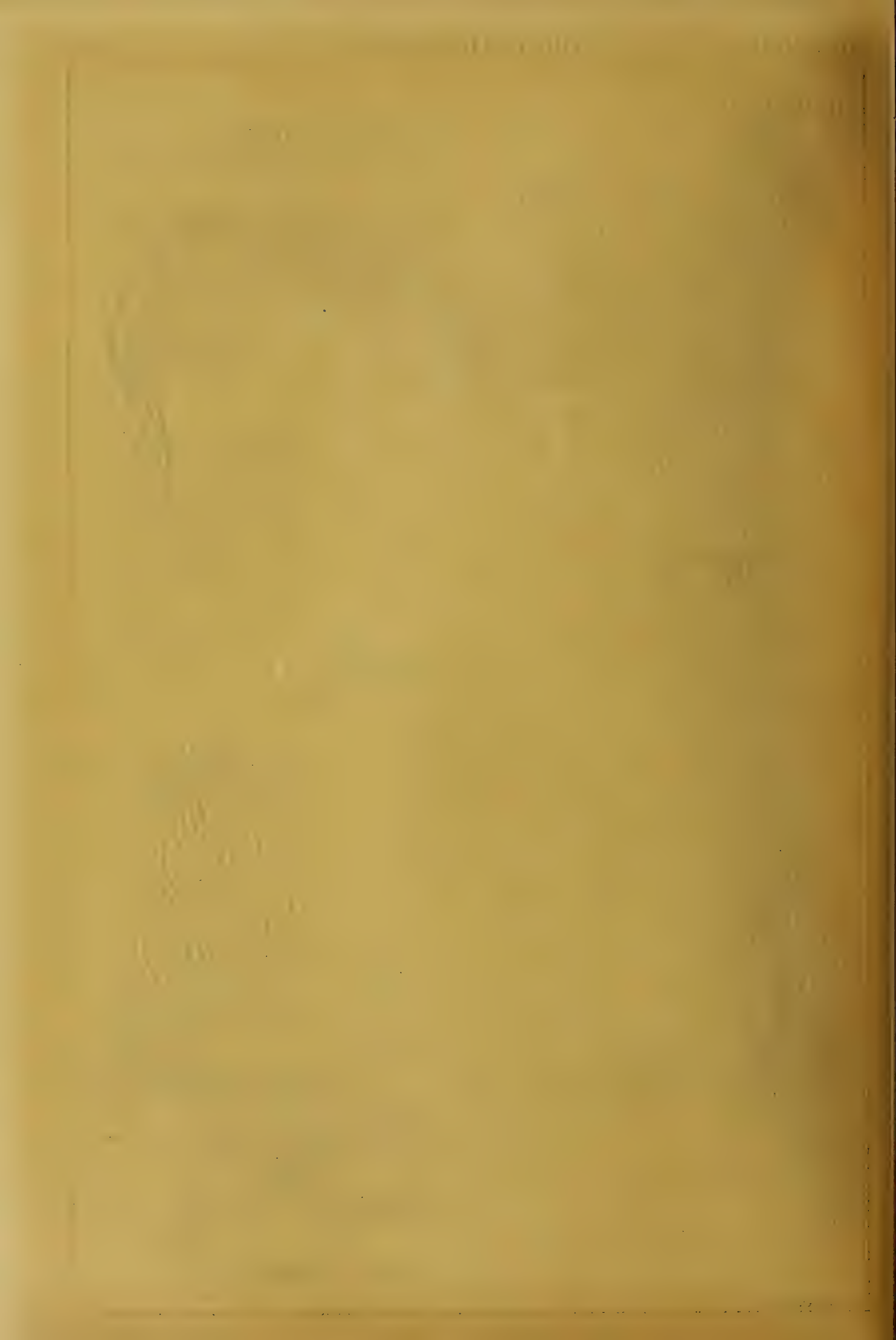
Longitudinal Section.

Scale of Feet  
0 10 20 30 40 50 60 70 80 90 100

West Elevation

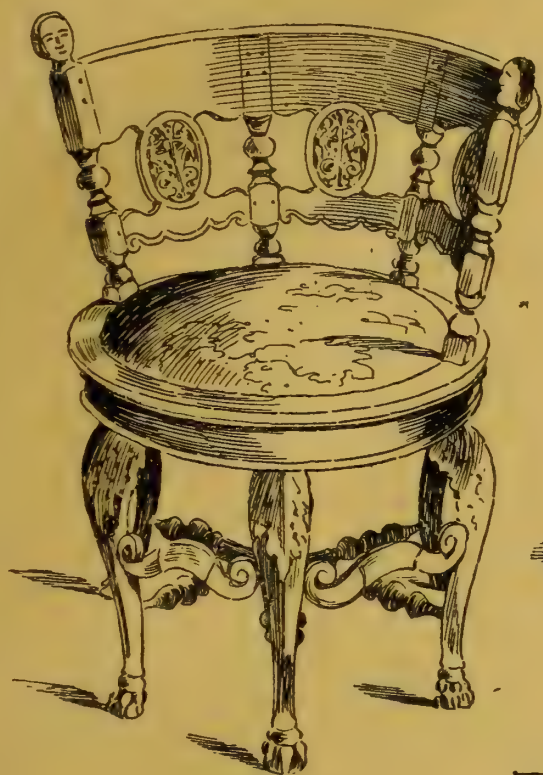




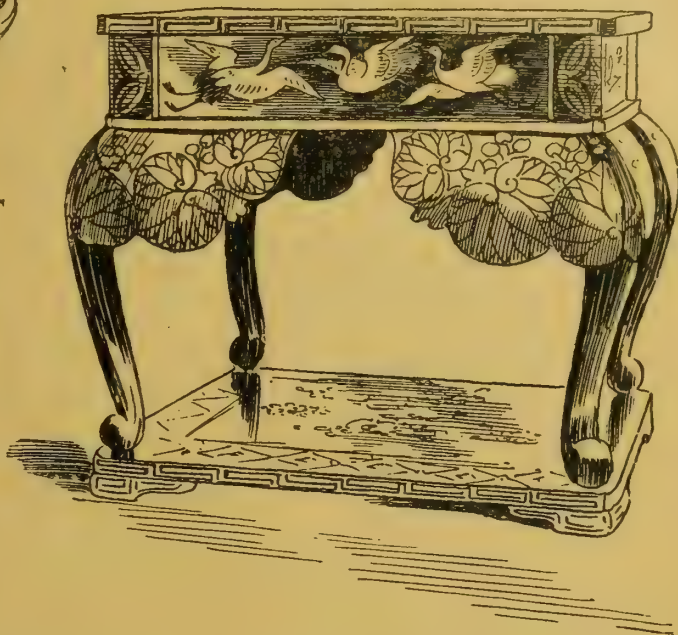




CIRCULAR ARM-CHAIR.  
WITH REVOLVING SEAT

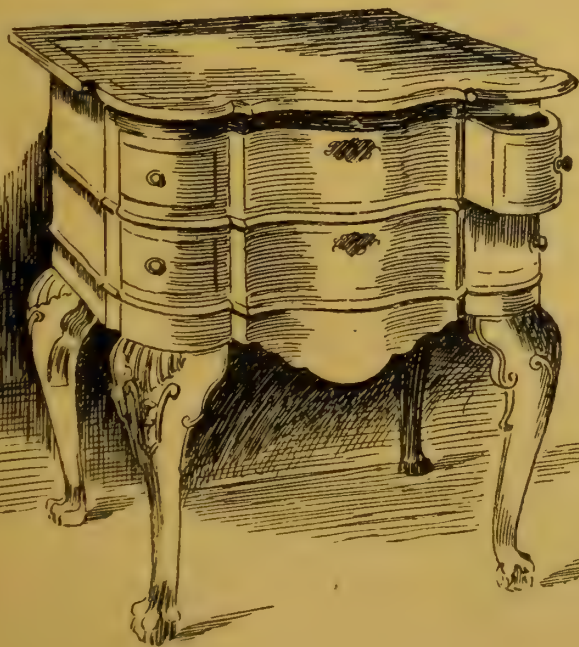


LACQUER TABLE.  
BELONGING TO THE EARL OF ELGIN.

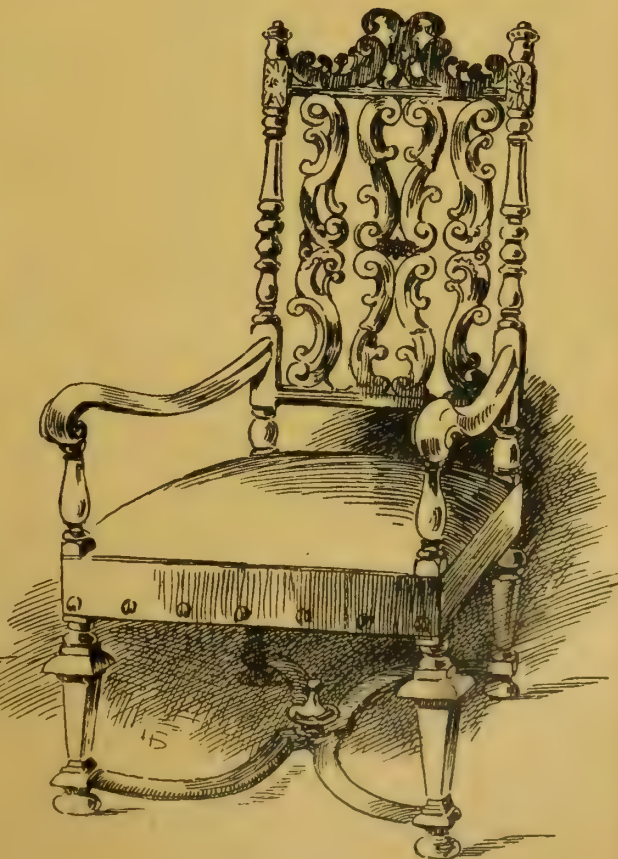


# TABLES AND CHAIRS

FROM NOTABLE COLLECTIONS.



QUEEN ANNE SIDE TABLE



WILLIAM III ELBOW-CHAIR



## Building Intelligence.

**CALLINGTON, CORNWALL.**—Nine months ago the tower of St. Mary's Church, Callington, was destroyed by fire. The bell-chamber and clock-room below was totally destroyed, the roof fell in, the peal of six bells (hung in 1775) was melted, the molten metal running in streams to the foot of the tower, and the town clock (erected in 1864, at a cost of £150) was also destroyed. Damage to the extent of some £900 was done, and whereas the church itself was insured in over £1,000, the tower, with the exception of the woodwork, was not included, and the bells and clock were only insured in £140. Fresh funds were raised, and it was decided to replace the town clock with its two dials, with a new timepiece having four faces, and striking the quarters as well as the hours. The clock, which will cost £129, has already been ordered of Messrs. Smith and Son, of Derby, and will be placed in position during May. Steps were also taken for carrying out the repair and restoration of the fabric of the tower, and the work has been carried out by Messrs. Hobbs and Son, builders, of Rilla Mill. The new peal of six bells, which have been hung by Mr. W. Aggett, of Chagford, were cast by Messrs. Mears and Stainbank, of the Whitechapel Foundry, London, and cost £450. The dedication of the new bells took place on Tuesday week. The total outlay has been about £950.

**CHEETHAM HILL.**—The new Wesleyan church at Cheetham Hill, Manchester, which has been erected at a cost of nearly £12,000, was opened last week. It stands in the Bury Old-road, near the entrance to the Polygon, and is 15th-century English Gothic in style. The building is grouped from the standpoint of the Polygon entrance. In the centre part is a tower and spire, flanked with a pinnacle gable on the left, and with an octagonal staircase on the right, and a projecting narthex. The building is faced with stone, and the interior woodwork is of pitch-pine. The choir stalls and organ-cases are of oak, while the pulpit and font are of Ancaster stone, with panels of alabaster. The nave is broad, and the side aisles are used only as passages to the pews. The building has been constructed by Messrs. Neill and Sons, from the designs of Messrs. W. Waddington and Son, architects, of St. Ann's-square, Manchester.

**GLASGOW.**—The plans of the new Empire Palace Theatre, which is to replace the old Gaiety Theatre in Sauchiehall-street, were before the Glasgow Dean of Guild Court on Friday. The new building, which is modelled somewhat upon the Edinburgh Empire Palace, is in a mixed French and Italian style. The exits and entrances remain as before, but a new elevation towards Sauchiehall-street has been necessitated by the insecurity of the walls in that part. Built to a height of four stories, the building is surmounted by a large central dome, upon which is set a high flagstaff. Beneath this dome, which is flanked by a couple of turrets rising from the first story, is a pediment which bears upon it in large letters the words "Empire Palace Theatre." Underneath this again is the main doorway, semicircular topped, and with a verandah running above it, whilst a few yards to the west is the stage door. The roof of the new theatre is a raised one, and lantern-topped, and has a dome similar to that in the centre at its north-west and north-east angles. No objection was taken to the plans on Friday, but they were formally continued until next Court day, that the withdrawal of the plans prepared for the old elevation (a new elevation not having been at first intended) might be arranged. Mr. Frank Matcham, of London, is the architect of the new building.

**PETERBOROUGH.**—Schools for the parish of St. John's, Peterborough, were opened on the new Bishop's-road on Monday week. They were designed by Mr. H. M. Townsend, and built by Mr. John Thompson, both of Peterborough. The accommodation is for between 600 and 700 children. The block comprises two distinct schools in one frontage, the east side being for girls, and the remainder for infants. The large room in the girls' school is 70ft. in length and 27ft. in width, a classroom and cookery-room being provided on the left, 25ft. by 22ft. in proportions. A large room in the infants' school is 47ft. 6in. by 22ft. On the west is a classroom and a room for babies, and these measure 19ft. by 22ft., and 21ft. by 22ft. respectively. The build-

ings are of white brick, relieved by bands of blue. The rooms are heated by Musgrave's stoves. The cost has been £3,300.

**PONTEFRAC.**—Without any ceremony, the recently-erected infirmary in connection with the Pontefract Workhouse has just become occupied with patients. The building is a red-brick structure, in the Domestic Classic style. The architect was Mr. J. A. Greaves, of Pontefract; the contractors were Messrs. Arnold and Sons, of Doncaster; and the cost of erection has been £7,100. The furnishing has involved the expenditure of £600 extra. There are four large wards in the infirmary, two each side for men and women patients, and each containing sixteen beds, and being 52ft. long by 24ft. wide. In addition to these, there are foul-rooms, day-rooms, and nurses' quarters. The whole building is built on fireproof principles, fire-escapes being fitted up outside each ward.

**RICHMOND.**—The new Free Church, Ormond-road, Richmond, Surrey, was opened on Thursday, April 16th. The building stands on rising ground, with ample space on all sides, and the total cost of the works, including land, has been about £5,000. The church has been erected by Messrs. Holloway Bros., of Battersea, from the designs, and under the personal superintendence, of the architect, Mr. T. Locke Worthington, A.R.I.B.A., of Queen Anne's Gate, Westminster. The walls are of brick, with buff terracotta dressings, as supplied by the Burmantofts Works. The vestibule and high dado round church are of oak, and the little nave, measuring 60ft. by 30ft., is divided by three oak aisles. There are two transepts for organ and church offices respectively, the latter being divided off by a silent proof screen. The choir apse has an arcade running round about 8ft. from ground, all detail being in buff terracotta. The church is heated by three Musgrave stoves, the flues being carried up to the highest points of the building.

**ROEHAMPTON.**—On Saturday, April 8, H.R.H. the Duchess of Teck laid the foundation stone of the new church of Holy Trinity, Roehampton. The work of designing the new church was placed in the hands of Mr. Geo. H. Fellowes-Prynn, F.R.I.B.A., of 6, Queen Anne's Gate, Westminster, S.W., whose designs were accepted, and tendered for last year. The tender of Mr. Arthur Porter, builder, of Tottenham, was duly accepted, and the work commenced in November, 1895. Considerable progress in the foundations has already been made. The orientation of the church will not be quite due east and west, but nearly so. The architect has placed the tower and spire at the lower north-west corner, and thrown out a double-gabled transept and apsidal-ended chapel on the north side, keeping the vestries, organ-chamber, and baptistery on the south side towards the common. The main entrances are at the north-west and east end, one being under the tower and the other at the side of the chapel. The nave is 79.7ft. in length, and 24ft. in width, and gives accommodation for 308. Aisles, 12.6ft. in width, are placed north and south, and a double transept 24ft. wide by 31.6ft. long is thrown out on the north-side. This transept forms, as it were, the nave of the side chapel, and gives accommodation for 80 adults. The chancel, which is to be divided from the nave by a lofty arch and screen, is 35.4ft. in length, and is the same width as the nave, and will give accommodation for a choir of 40. Good sized choir and clergy vestries and lavatories are placed on the south side of chancel, with a heating chamber under same. A circular staircase leads from the choir-vestry to the organ-chamber, and parish-room over the vestry. Externally, the church will be faced with Kentish Rag stone, and internally with red and yellow brick, relieved with stone. The dressings throughout will be of Corsham Down stone. The roof will be tiled. The amount of the present contract is £8,710; but this does not include the upper stages of tower and spire or the baptistery. The total cost of the church, when completed, will be about £11,000.

**TAUNTON.**—The chairman of the Somerset County Education Committee opened, at Taunton, on Friday, the new technical buildings which have been erected in connection with the Huish endowed school. The building include a lecture-room, 30ft. by 20ft.; a laboratory, 27ft. by 20ft.; and a workroom, 25ft. by 20ft. The new part is in the same style as the other portion, being of brick, with dressings of Ham Hill stone, and connection is afforded by a corridor. Mr. J.

Houghton Spencer was the architect. The contractor was Mr. G. H. Pollard, of Taunton, the fittings were supplied by Mr. J. Morse of the same town, and Mr. T. R. James, of Exeter, was employed as clerk of the works. The cost, including the fittings, has been £2,000.

### CHIPS.

A warehouse at the corner of Carey-lane is nearing completion. It is being faced with Portland stone, is in the Renaissance style, and will cost about £7,000. The architect is Mr. Delissa Joseph, F.R.I.B.A., of Basinghall-street. Messrs. Perry and Co., Tredegar Works, Bow, are carrying out the contract.

The Bishop of Richmond preached a sermon in East Keswick Church on Thursday night on the occasion of the opening of a new organ, built by Abbott and Smith, of Leeds.

Mr. Alfred Gilbert, R.A., will probably be the sculptor intrusted to execute the memorial statue of the late Earl of Pembroke. Over £1,000 has been subscribed by the public, and the family of the deceased nobleman will make up the sum requisite. The site will be opposite Fugglestone Church, near Wilton, where Lord Pembroke was buried.

The galvanising works of Messrs. Lysaght, Ltd., are being removed from Wolverhampton, in consequence of the difficulty which has arisen of meeting the requirements of the corporation in regard to sewerage.

The shareholders in the Todmorden Industrial Co-operative Society have decided to celebrate the society's jubilee by building a free library and by transferring thereto and presenting to the town the whole of the society's library, consisting of over 8,300 volumes of books, subject to the Free Library Act being adopted by the town.

The public hall and library at Cwmanan, Aberdare, recently erected at a cost of £3,000, was completely destroyed by fire on Sunday. Most of the books were safely removed. The loss is covered by insurance.

A new theatre is about to be built at Chesterfield from plans by Messrs. Rollinson and Son, of Corporation-street, in that town.

The Building Clauses Committee of the Leeds Corporation have acceded to a request from the Leeds and Yorkshire Architectural Society fixing a day to receive a deputation from the society, which desires to suggest certain modifications in the existing arrangements for dealing with plans in the Building Inspector's Department, and by the committee itself, with a view to facilitating the work of architects. The proposals to be advocated before the committee will be supported by nearly all the principal architects in the city.

A new building is being erected on the south side of Cheapside between the premises of the London Stereoscopic Co. and the Aërated Bread Co. It is being erected by the freeholder himself, Mr. William Shepherd, in the French Gothic style, with a Portland stone front. It will consist of a basement, a ground floor, and four ordinary floors, with a flat concrete roof with iron girders, and will be fire-proof. The frontage, which will be some 36ft. 6in., runs back 52ft. Mr. J. E. Saunders, F.S.A., of Finsbury-circus, is the architect.

At the London Consistory Court on Tuesday a faculty was granted, authorising a number of alterations in the church of St. Gabriel, Pimlico, including the removal of the north and south galleries and the erection of a gallery across the west end of the nave. The estimated cost of the alterations is about £6,000.

The London County Council on Tuesday resumed the consideration of the report of its committee upon the water supply of London. It resolved that it was desirable to obtain an additional supply from some source other than the rivers Thames and Lea, and that the valleys of the Usk, Wye, and Towy furnished a suitable area, from some part of which supplies could be derived. The proposals to continue the surveys of the Welsh areas, and to expend a sum of £10,000 upon the inquiry, were withdrawn. At the same meeting the report of the improvements committee in reference to the proposed new street from Holborn to the Strand was also withdrawn for further consideration.

About 200 members of the Edinburgh Association of Science and Art visited Glasgow on Monday, and inspected the Parkhead Forges and Rolling Mills belonging to Messrs. W. Beardmore and Co., and the Glasgow Corporation sewage works at Dalmarnock.

The General Purposes Committee of the Burnley Corporation considered on Monday an offer from Lady O'Hagan to dispose of Towneley Hall and sixty acres of park, the hall to be preserved as a museum and the land as a public park. The committee decided what sum to offer, and it is expected there will be no difficulty in coming to terms.



## BOOKS RECEIVED.

*A Practical Guide to Warming Houses from the Kitchen Fire by Low-Pressure Hot Water*, by THOMAS POTTERTON (Balham).—This is a descriptive account of the author's low-pressure one-pipe system of heating by hot water, which he recommends for houses and other buildings. Numerous diagrams show the method as applied to houses, in which the author uses a zigzag boiler which exposes a large heating surface to the fire, said to be six times that of a boot boiler. Another illustration shows an improved rising bottom under the firebox, which lifts the fire above the flue if necessary, which is made independent of the range. Another section of the book describes a method of converting domestic hot water into heating apparatus. A form of specification for fixing a range and boiler and hot-water supply, &c., is given.—*The Engineer's Year-Book*, by H. R. KEMPE, A.M.I.C.E., M.I.E.E. (London: Crosby Lockwood and Sons), grows in usefulness yearly. The present edition comprises much new matter, and the whole is brought well up to date. The added pages deal chiefly with Brakes for the Measurement of Power, the Bursting Strength of Tubes, Spiral Springs, Electrical Engineering, Pumps and Mining. Mr. W. H. Booth, Mr. E. H. Davies, and Mr. J. W. Gunnis have helped the editor materially with matter and suggestions.—*Leek and District Illustrated* (Leek: M. H. Miller), is one of the albums in paper covers now so popular, containing letter-press reproductions illustrative of the ancient Metropolis of the Staffordshire Moorlands. Portraits are given of the late Mr. William Sugden, and his son Mr. Larnier Sugden, and a large proportion of the illustrations is devoted to buildings in Leek erected from plans by these architects, including the Alsop Memorial Hospital, additions to the Town Hall, St. Edward's Schools, Manchester and Liverpool Bank, and the residences known as Highfield, Little Hales, Woodcroft, and Mixon Hay.—*Association of Surveyors of H.M. Service: Occasional Papers*—Second Series, Dec. 1895 (Brighton: Trill and Son), contain a few articles of interest. "The Relation of Pathology to Sanitary Engineering," by J. T. Hurst deals with the nature and properties of pathogenic germs, their modes of action, the question of the spore-producing power of the typhoid and cholera bacilli. Sewer ventilation and the filtration and purification of water are touched upon, and the author's endeavour appears to be to show how necessary a knowledge of pathology is to the engineer who has to decide between the conflicting opinions and statements of expert chemists and others. Articles appear on "Small Gas Plants," in which the author, Mr. T. Ivor-Moore, deals with substitutes for coal-gas, especially oil-gas, produced by the decomposition of liquid hydrocarbons by heat, and mentions in this connection the Patent Paraffin-Gas Lighting Co., of Glasgow, who have introduced a useful plant. "The Preparation of Approximate Estimates," by Mr. T. E. Coleman, is a useful list, showing the average cost of War Department buildings and works, which has been found of service in preparing preliminary estimates for similar works. "Notes on Cylinder Piers for Bridges," by H. J. Child; and "Lighting," by J. T. Rea, are other papers of some value.—*Griffin's Electrical Engineers' Price Book*. Edited by H. J. DOWLING (London: Chas. Griffin and Co., Ltd., 8s. 6d.), is made more useful and up-to-date even than before, by the addition of 70 pages of new matter. Architects and builders will find the prices given fair and reliable.—The chief feature of the current issue of the *Essex Review* (Chelmsford: E. Durrant) is an article on Hornchurch Church, by Mr. FRED CHANCELLOR, F.R.I.B.A., illustrated with perspective, plan, and details.—*The Engineering Magazine* for March (New York) (London: George Tucker, Salisbury-court) contains several articles of general interest. Mr. R. W. Gibson has a timely paper on "The Architecture of Modern Bank Buildings," having reference chiefly to interior arrangement. Different types of plan are illustrated, from the simple parallelogram dividing a public lobby or space from the clerical department of the bank, which is still the best for some restricted sites, to plans in which the counter-length is increased by making it of the horseshoe form, two types of which are given, one showing the public body surrounded by the counter and book-keepers' space, the other placing the book-keepers in the centre, with lobbies on each side, one for men

and the other for women. Another type of plan is the banking-room of the Chase National Bank, New York. In this the entrance is on one side, with the public lobby forming a T-shaped space, and the banker's space filling up the other portion. Domed ceilings and large central skylights are recommended. Other papers on Prof. Röntgen's "New Radiance," "Artistic Engine-Room Interiors," and "Lighting by Electricity" will be found of interest. The pages are well illustrated.—*The Wood Industries of Sweden* (London: *The Timber Trades Journal*, 14, Bartholomew-close) is a well printed and illustrated quarto volume, brought out by our contemporary *The Timber Trades Journal*, in which journal the articles, we believe, appeared. It was a good thought to publish in a book form the useful information and statistics collected together on the wood industries of Sweden. The volume is a compilation of much useful information and returns. It is of some interest to learn how the shipments of sawn and planed wood has increased from the year 1852. In that year 435,395 loads were shipped from Sweden, while in last year the return is 2,989,000, nearly three millions of loads. These suggestive figures show to what an extent the demand for sawn wood has grown. From Norrland alone a great deal of it comes, and this province dominates the trade, for from the south of Sweden the export has been nearly stationary. The United Kingdom is by far the largest importer of all European countries. The forest exhaustion in Norrland is a burning question, and legislation will have to deal with the matter quickly. The compilers enter largely into this important question. Many interesting points are raised, as, for example, the cost of carriage. It will hardly be believed that the rates of English railway companies are decidedly the highest in Europe, and that "wood goods can be carried cheaper from the interior of Sweden and delivered in an English harbour than they can be moved 150 miles by rail in England." The firewood, stave, square timber, and pulp-wood trades are now very important industries. As to the joinery trade, some useful facts are given. The output of Swedish joinery for the last year was about 200,000 doors, 50,000 sashes and frames, and 50 or so million of feet of mouldings. The districts from which goods are exported are described and illustrated. The Gothenburg district is the headquarters of the joinery trade. The Stockholm district is also well known for manufactured joinery. Then we have illustrated articles on the Gefle district, the Soderhamn district, the Sundswall, and other ports. The work is a useful summary of the quantity of sawn wood shipped from the great Swedish ports, of the condition of the trade in each district, and will be a valuable book of reference on the timber trade of Sweden.

## CHIPS.

An arrangement has been come to between the Lancashire and Yorkshire Railway Company and the corporation of Manchester in regard to the improvements at Victoria Station in that city, and the Company's Bill will now go before the Chairman of Committees of the House of Commons as an unopposed measure.

The increase in the business of the Tortoise Stove Works and Foundry, carried on by Messrs. C. Portway and Son, has necessitated the erection of a warehouse upon the firm's property adjoining the railway. The new building is of red brick, and is 55ft. by 33ft., and of two floors in height. The building has been erected by Mr. H. Runnacles, Messrs. Goodey and Cressall being the architects.

The new church of St. Andrew, Limsfield Chart, was consecrated on Wednesday week by the Bishop of Rochester. Mr. Reginald Blomfield was the architect, and accommodation has been provided for 220 people, at a cost of about £2,300.

On Wednesday week a meeting was held in St. Augustine's Schools, Kilburn, to consider the desirability of completing the church by the erection of the tower and spire. The vicar, who presided, stated that twenty years had passed since they made a great effort to complete the body of the church by erecting the nave. Mr. Pearson, R.A., was very anxious to see the spire raised, as it was the most important feature in the whole design. The lower stage of the tower and the foundations were built at the same time as the nave, and the estimate for its completion was £6,000. It was announced at the conclusion of the meeting that £3,200 has been promised.

An organ, built by Messrs. Ingram and Co., of Edinburgh, was opened on Friday night in the parish church of Granton, N.B.

## COMPETITIONS.

LIVERPOOL.—The committee of the Liverpool Northern Hospital have selected the competition plans submitted by Messrs. Pennington, Son, and Harvey, of London and Liverpool, for the building which is about to be erected through the generosity of the David Lewis trustees. The plans submitted in competition are to be exhibited at an early date.

SHARDLOW.—Some time ago the Shardlow Board of Guardians advertised for plans for the building of a workhouse infirmary. Twenty-five sets of plans were submitted under motto, and the committee reduced them to six, which were submitted to an assessor. The committee in their choice were unanimous. At the meeting on Friday it was agreed that the first prize which the board offered of £20 be awarded to Plan No. 11, Motto, "Red Cross"; and that the second prize of £10 be awarded to Plan No. 3, motto, "Axial." The sealed envelopes were then opened by the chairman, who declared that the winners of the first prize were Messrs. Edward Thomas and Sons, 7, Queen Anne's-gate, London, S.W., and the winner of the second prize was Mr. John R. Parkin, of Idridgehay, near Derby.

## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

## TERMS OF SUBSCRIPTION.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

PANTILE. (It is impossible to state the average age of competitors. If our criticism on your design "came rather as a shock" to you, let it galvanise you to increased effort and improvement.)

CLAUDE B. ANDREW. (Your drawings are very late, and came in after our choice was made. We cannot tell you the average time occupied by the competitors on their work. You will in due course work more quickly if you persevere.)

RECEIVED.—E. F. (Arundel).—A. R. and Co.—A. L. T.—Interested.—W. S. Gordon.—G. M. and Co.

## "BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Oberon," "Invicta," "Owl," "Tommy Atkins," "Pickwick," "Como," "Carlisle," "Maudslayi," "Venus," "A. B. C.," "Kaffir," "Mac," "Lancastrian," "Fear," "Moor," "Brian."

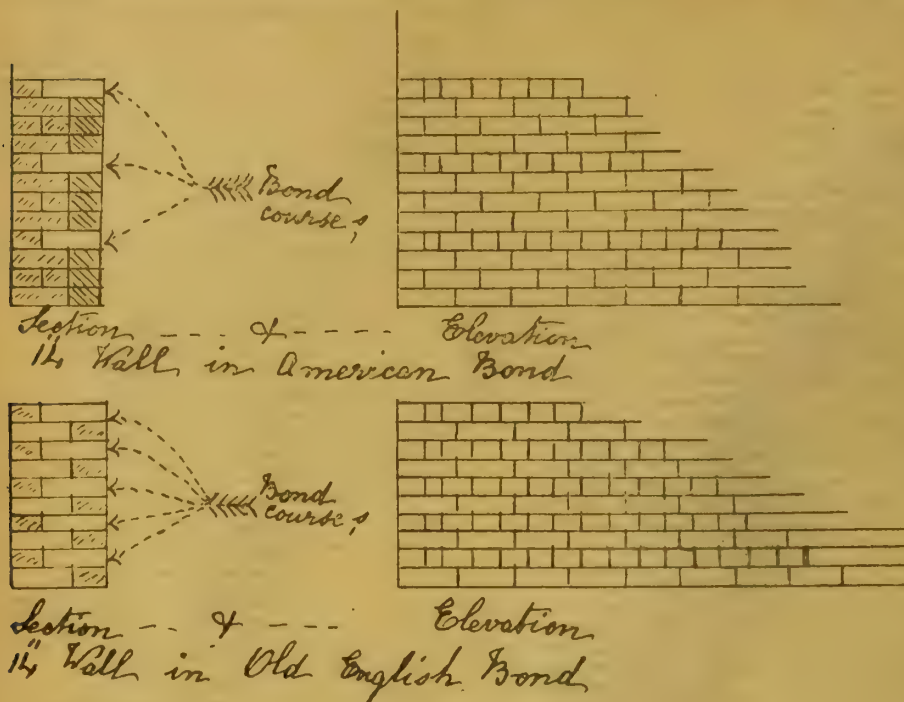
## Correspondence.

## BRICK BOND.

To the Editor of the BUILDING NEWS.

SIR,—In your issue of April 3rd, page 496, column 3, Mr. F. Walker said that, as a practical





clerk of works, he considered the weak point in the test was the bond adopted. In the United States it was customary to use a  $4\frac{1}{2}$  bond throughout, with headers throughout every third or fifth course. In Dutch bond the closure was done away with, and so a source of weakness was avoided. The American bricks were broader and better than English ones. Does he mean to tell us that  $4\frac{1}{2}$  bond is better than English bond? Will he kindly give us a sketch of an 18in. pier in Dutch bond? As regards the quality of English bricks, let him inspect the Midland Grand Hotel, and I think he will find both bricks and workmanship as good as any the United States can produce.—I am, &c., HENRY J. BLAKE.

#### CHIPS.

The new Flavel Memorial Congregational church at Dartmouth was opened on Wednesday.

Messrs. Fambrini and Daniels, Architectural Concrete Works, Lincoln, have secured the contract for supplying, in their buff concrete, the whole of the dressings for the new theatre, West Bromwich. The above consist of moulded door and window jambs, with elliptic and circular arched heads, modelled caps, spandrels, finials, panels, and consoles, pierced and moulded parapets, and scrolled wing ornaments, enriched cornices, turrets, pediment, &c. The contractors are Messrs. Bradney and Lloyd, Shifnal; and the architects, Messrs. Owen and Ward, Birmingham.

A Select Committee of the House of Commons rejected, on Monday, the Bill for the construction of the Watford, Edgware, and London Railway.

The Kent Archaeological Society have selected Canterbury for their annual meeting in July. They will assemble in the Cathedral city on the 23rd July.

At Sunbury Petty Sessions, on Monday, the urban district council was summoned by the Thames Conservancy for failing to discontinue the flow of Sewage from the drains of Sunbury into the Thames. The magistrates decided that the Sunbury District Council was guilty of the offence, and fined them £10. The chairman said the Bench would state a case for a higher court, if necessary.

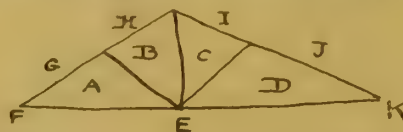
On Monday, April 13th, the Bishop of Guildford formally opened the new schools at Bransgore, near Christchurch, Hants. The site for the schools was given by the late Sir George Meyrick, and the building was erected at a cost of £630 by Mr. Harris, a local tradesman. The buildings are in a style adapted from the Gothic, and consist of a large room, 53ft. by 21½ft., for the elder scholars, and an infants' room, 24ft. by 21½ft., together with commodious and separate cloak-rooms and lobbies for boys and girls. The internal height of both rooms is 16ft.

The concluding meeting of the winter session in connection with the York Architectural Society was held in the Church Institute, Lendal, York, on Friday evening, when Mr. Geo. Benson gave a lecture, entitled "Old York," illustrated by lime-light views.

### Intercommunication.

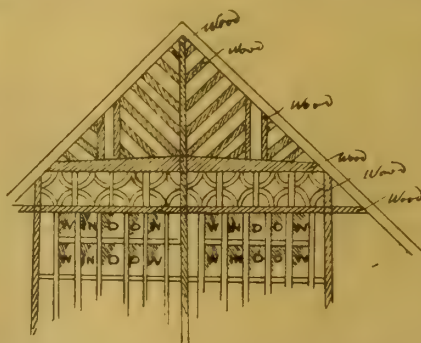
#### QUESTIONS.

[11500.]—**King-Post Truss.**—Would someone answer a question which has several times appeared in the examinations of the Royal Institute? I have tried various sources, but have not succeeded in arriving at any



satisfactory conclusion. Question: Give the reciprocal diagram of the king-post truss.—EDWIN J. TENCH.

[11501.]—**Brickwork and Timber Framing.**—In measuring up outside plastering on brickwork between timber framing, is it usual to exclude the timbers in the dimensions of the plastering, as the panels are small, and some shaped as sketch. The timbers are 1in. in front of



the finished surface of the plastering. I have been doing a building, and paid the plasterer labour all over; but the architect proposes to allow me for merely the nett surface covered by the plastering, deducting all timbers.—BAT AND BALL.

[11502.]—**Noiseless Paving for Stables.**—Can one of your readers give me information as to any paving for stables which will prevent the noise caused by the horses stamping and moving? It is proposed to build stables adjoining a house, and as one of the sitting-rooms will only be separated by a wall of ordinary thickness from one of the stalls, it is feared that the noise from the latter will be very objectionable. Cork bricks have been mentioned. Is there such a thing that would be applicable?—A. B.

[11503.]—**Riga White Floors.**—I am told that Riga white prepared flooring is very good. Would some obliging correspondent in the timber trade kindly give me some information as to marks, as to qualities, thicknesses, widths, how prepared, marks and colour of marks, export ports, and defects in these goods to be avoided? The timber marks book does not appear to make any reference to flooring exported from this port; unless, indeed, it has been introduced into a later edition than mine.—R.

#### REPLIES.

[11496.]—**Bolting to Rock.**—Will someone state from experience the comparative qualities of lead and

Portland cement for running in bolts to holes in basalt rock by the seaside, subject to tides?—LEVER.

[11496.]—**Bolting to Rock.**—How could you possibly get cement into the hole when the bolt is there at the same time? The cement might be run in a liquid state, but it would have no strength at all, and would be no good for resisting the impact of the waves. You must certainly use molten lead run in quickly and regularly. The bolts used, would, of course, be "rag bolts," and the idea in using lead is to have a material which will run into and completely fill up spaces about the bolt, and also, in the strata of the adjoining rock (which cement would never do), so that the bolt and the lead may together, as it were, form part of the rock itself.—ALLEN T. HUSSELL, Ilfracombe.

[11499.]—**Verandah Roof Covering.**—Why not try wrought-iron plain sheets, or corrugated iron (painted) looks very well, and would stand the wind pressure if properly bolted down?—ALLEN T. HUSSELL, Ilfracombe.

### Legal.

#### COVENANTS NOT TO ASSIGN.

A VERY usual covenant in leases is that made by the lessee that he will not assign without the lessor's license having first been obtained. It is also very customary to add that such a license shall not be unreasonably withheld in the case of a respectable and responsible tenant being found. It has never yet been definitely decided what is the legal effect of this word "unreasonably." The recent case of "Bates v. Donaldson" (Times, March 31) is therefore of some interest and importance. That was an action in which the plaintiff, the lessor, sought to recover possession of a house in Cavendish-square for breach of the usual covenant not to assign without license, which had not been given. The house had been leased to a Mrs. Wilson for 14 years from 1888, and the lease contained this covenant against assignment. The lessee had applied to the plaintiff or lessee, and had admittedly found a responsible and respectable tenant, with whom she had made an arrangement which the Court of Chancery had compelled her to carry out in an action for specific performance. She had accordingly assigned the lease to the defendant, and now the real question was: whether or not the plaintiff's license to assign had been "unreasonably withheld."

It appeared that the plaintiff had refused to consent to the proposed assignment, not because he had any objection to the new tenant, but because he wanted the house for himself. For the defendant, it was argued that this refusal to give the necessary license to assign was "unreasonable." It was contended that, although there might easily be reasonable grounds for such a refusal—as, for instance, if the tenant wished to use the house for trade purposes—yet the fact that the lessor wanted it himself was certainly unreasonable. Mr. Justice Mathew held that the object of the covenant was for the protection of the landlord and the lessee. The meaning of it was that when the proposed tenant was a responsible and respectable person, there must be some reasonable cause to object to him. If it were otherwise, the landlord's right to refuse leave to assign would really be absolute. He then held that the plaintiff's desire to have the house for himself was not a reasonable ground, and so he gave judgment for the defendant, the assignee, with costs.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

OLD SUBSCRIBER.—ARCHITECT.—BUILDING.—LIABILITY.—This would be more a matter of fact than of law. Upon your statement, and in the absence of all negligence on your part, you could not be held legally liable. There is no such special limit of time as you suggest.

R. T. LONDON.—ARBITRATOR.—SETTING ASIDE AWARD.—You can apply to the Court to set aside the award on the ground of bias in the arbitrator. The result would depend upon the facts you can prove, and is rather doubtful.

W. H. B.—ARCHITECT.—PENALTY.—CERTIFICATE.—The answer to this question depends rather upon the form of the contract than upon anything else. If there is power to retain penalty you should do so; if not, give final certificate with special clause as to penalty having been incurred, and let the owner act as he likes.

CARP.—COUNCIL.—ROADSIDE WASTE.—I do not think the district council could, or would, reverse the decision of the preceding Local Board in this matter.

A receiving order has been made in the case of William Frederick Coney, of Fenchurch-street, E.C., and Southend-on-Sea, builder and contractor,



## LEGAL INTELLIGENCE.

**FRONTAGE LINES ON CORNER SITES.**—At the West London Police-court on Tuesday last, before Mr. Lane, Q.C., a summons was heard at the instance of the London County Council against Mr. William Ayres, of Clifton House, Mall-road, Hammersmith, for failing to set back the external wall of a building the prescribed distance from the centre of Rose and Crown-lane, Hammersmith. Mr. Chilvers, from the Solicitor's Department, prosecuted, and Mr. Shaw, barrister, defended. In opening the case, Mr. Chilvers explained the summons was taken out under section 14 of the London Building Act 1894, the defendant having erected an addition to No. 199, Hammersmith-road, the external wall of which was not the prescribed distance from the centre of a public footway known as Rose and Crown-lane. Notice had been served on the defendant requiring him to set the building back, which he had failed to do, and was therefore liable to a penalty under sub-sec. 2 of 200 of the Act, of not less than £2 and not more than £5. In support of the summons, Mr. Davoston, a surveyor in the office of the Council, and Mr. Jones, an assistant in the Surveyor's Department of the Vestry, were called, and produced plans of the building, which showed it to be erected at the corner of Hammersmith-road and Rose and Crown-lane, and close up to the boundary of the lane, which was only about 5ft. wide. For the defence, Mr. Shaw contended that the building was numbered in, and situate in Hammersmith-road, and that the section of the Act did not require the building to be set back from the centre of more than one street, that being the street in which it was situate. The magistrate stated that it had been decided a building could be in more than one street, and he was of opinion that the section required that buildings should be set back the prescribed distance from the centre of any street on which they abutted, and he fined the defendant £2, and also ordered him to pay £2 2s. for costs.

**ECCLESIASTICAL DILAPIDATIONS.**—**R. V. BISHOP OF HEREFORD.**—In this case, in which judgment was given on Friday by the Lord Chief Justice and Mr. Justice Wright, Mr. Kempe showed cause against a rule for a *mandamus* to be directed to the Bishop of Hereford commanding him to consider certain objections of the Rev. William Heaton, formerly incumbent of Ditton Priors, to the report of the diocesan surveyor for dilapidations in respect of the buildings of the said benefice, in accordance with section 34 of the Ecclesiastical Dilapidations Act, 1871. Mr. Heaton was incumbent of Ditton Priors, Salop, up to December 13, 1893, when he obtained other preferment. The late Bishop of Hereford instructed the diocesan surveyor to report on the dilapidations. The report was made on February 1, 1894. Mr. Heaton sent in his objections on December 7. One of the objections was that items were included which were not properly part of the premises of the benefice, but Mr. Heaton's own property. The Bishop, however, confirmed the report of the surveyor, as Mr. Heaton refused to have a second report made at his own expense. The rule *nisi* had been obtained on behalf of Mr. Heaton on two grounds—one, that as a fact the Bishop had not considered the whole matter, and secondly, that the Bishop had stated that he had no authority to consider the report, but was bound to act on it unless a second one were made. The Bishop has now made an affidavit stating that he was consecrated Bishop of Hereford on March 25, 1895. On April 3 Mr. Beddoe, the Bishop's secretary, visited him, and brought the matter of the Ditton Priors dilapidations under his notice. He discussed the matter with him, and directed a correspondence with Mr. Heaton, and also with the surveyor, to ascertain if the surveyor still considered the sum named in the report fair and reasonable. The affidavit continues, "Having myself considered the whole matter, including the various contentions of Mr. Heaton, I came to the conclusion that Mr. Heaton's objections, so far as they were valid, could not be properly dealt with by any personal investigation of my own, but only by ordering a second survey, and that as this was declined by Mr. Heaton I must accept Mr. Oswell's report, and make my order in accordance with it." He signed the order accordingly. Sections 29 and 34 of the Ecclesiastical Dilapidations Act, 1871, are material. The Court discharged the rule. The Lord Chief Justice said the question turned on section 34, which provided that in contested cases the Bishop was to decide "after consideration of the whole matter." The Court had no power to review the decision of the Bishop, and, the Bishop stating that he had considered the whole matter, the rule must be discharged, but this would be without costs. Mr. Justice Wright concurred.

**BEXHILL ARCHITECTS' PARTNERSHIP.**—In the Queen's Bench Division, on Friday, before Mr. Justice Day, the case was heard of Alton v. Hicks. It was brought by Mr. William Herbert Alton, an architect and surveyor, of Bexhill, against Mr. Hicks, also an architect, residing at the same place, to recover a balance due in respect of money lent. The defendant did not set up any defence with regard to £34 4s. of the sum claimed, but disputed the balance, amounting to over £120. The plaintiff's

case was that he had joined the defendant in his business, and during their connection he had lent Mr. Hicks various sums of money on his personal account. The defence was that some of the money had been given for the purpose of the business, and that the larger sum had been advanced for the purpose of assisting to finance a builder to whom Mr. Hicks had lent considerable sums on the security of the building property. Mr. Justice Day, however, gave judgment for the plaintiff for the amount claimed, with costs.

**A STREET PAVING ASSESSMENT.**—**WHITE v. THE VESTRY OF FULHAM.**—In the Court of Queen's Bench on Saturday, Mr. Justice Hawkins and Mr. Justice Vaughan Williams gave judgment in an appeal from a magistrate's decision to enforce an assessment upon owners of property in respect of the paving of a new street. It was heard on January 21 last, and judgment was now given. Mr. Justice Hawkins said that the circumstances were somewhat complicated, and therefore they had taken time to consider the matter. The new street in question was known as St. Thomas's-road, in which, on the northern side, there were about thirty small houses, two of which were owned by the appellant. In 1870, the vestry resolved to pave the thoroughfare, under Section 105 of the Metropolitan Local Management Act, 1855, as a new street, and they assessed the owners of the houses on the northern side in respect of the cost. In 1888 the owner of the boundary fence on the southern side of the street, offered to put back his fence 13ft.; this offer was accepted, 6ft. were added to the roadway and 7ft. reserved for a footpath. The vestry resolved again to treat St. Thomas's road as a new street in reference to this addition to the width of the street, and the paving of it; and they assessed the owners of the houses on the other side of the road to contribute to the cost of paving, though their houses did not abut on the new part. The appellant's assessment was £7 4s. 6d.; he refused to pay it; the magistrate ordered that he should pay, and it was this decision that was now appealed against. Mr. Justice Hawkins cited the cases of "Richards v. Kessick," "The Great Eastern Railway Co. v. Hackney Board of Works," "Midland Railway Company v. Walton," "Regina v. Hackney Board of Works," "St. Giles, Camberwell v. Hunt," "St. Giles, Camberwell v. Crystal Palace Co.," and "Wilson v. Vestry of St. Giles, Camberwell." He was of the opinion that the vestry was absolutely without jurisdiction to resolve a second time to treat the whole of St. Thomas's-road as a new street in respect of the addition to its width upon the southern side of the thoroughfare. The appellant must, therefore, succeed. Mr. Justice Vaughan Williams concurring, the appeal was allowed, with costs.

On Saturday afternoon the new branch library situated in the Moseley-road, Balsall Heath, was opened by the Mayor of Birmingham. The new building, which is the ninth branch library in the city, has been erected at a cost of £5,000, and at present contains 7,000 volumes. Messrs. Cossins and Peacock are the architects, and Mr. R. Fenwick is the builder. The style is English Renaissance, and the walling is of Leicester red bricks with biscuit-buff terracotta dressings, green Westmoreland slates being employed for roofing.

The Roman Catholic Bishop of Clifton has laid the foundation-stone of a new church on the Dunster-road, Minehead. The architect for the church is the Very Rev. Canon Scoles, of Yeovil, and its erection has been intrusted to Mr. W. Harrison, builder, of Minehead. The style is Early English, and the building will be of Alcombe red sandstone, worked to a rock face, with Bath-stone dressings and solid Bath-stone windows. Later on a presbytery adjoining the church will be added, whilst the church itself will be completed by the end of August next.

Last week was an unusually busy one at Tokenhouse-yard, and the aggregate of £169,817 was announced—almost a record for the month of April. Freehold, copyhold, and leasehold ground-rents sold with the greatest freedom; two important City leaseholds and a residential property at Wimbledon also formed features of the week's dealings, while many life policies and reversions and a number of investments in Metropolitan and suburban properties changed hands.

The rural district council of Bath have elected as their surveyor Mr. Bolwell, who held a like office under the old highway board, and at the former salary, £240 a year.

On the site of the old Wesleyan chapel, Commercial-street, Skelmanthorpe, there is now being built a new chapel, at which fourteen memorial-stones were laid on Saturday. The new chapel will be Gothic in style, with the roof half-ceiled. The work is being carried out under the superintendence of Mr. J. Berry, architect, of Huddersfield, whose design was chosen out of twelve sent in. The total cost of the chapel (which will seat 360 persons), including the organ, will be about £2,000.

## PARLIAMENTARY NOTES.

**EXHIBITION BUILDINGS AT SOUTH KENSINGTON.**—In answer to Sir H. Howorth, Mr. Akers Douglas said, on Friday night, the question of continuing the exhibition buildings at South Kensington is receiving the attention of the Government. The existing plans having been prepared on the assumption that the buildings were required partly for purposes of the secretariat may have to be reconsidered in connection with the recommendations of the Royal Commission on Secondary Education. Under these circumstances he did not see his way to proposing a supplementary estimate this year.

**VENTILATION ON THE METROPOLITAN RAILWAY.**—A Select Committee of the House of Commons began, on Tuesday, the consideration of the omnibus Bill of the Metropolitan Railway Company. The committee, having considered and passed the clauses relating to the reconstruction of Aylesbury Station, proceeded to the clauses under which powers are sought to acquire large areas of additional property in Euston-road, Marylebone-road, and Praed-street. Mr. J. Wolfe Barry, C.B., in his evidence, stated that this property was required for the erection of ventilating shafts upon the principle of those placed on the Thames Embankment over the District Railway. The erection of these ventilators had greatly purified the air on that line. These powers are strongly opposed by the vestries of the district, and by the owners of property. The committee passed these clauses on Wednesday, but with the addition of a proviso referring the whole question of the method of erecting the ventilators to an arbitrator to be appointed by the Board of Trade.

## WATER SUPPLY AND SANITARY MATTERS.

**EPSOM.**—The urban district council are asking for powers to borrow £11,500 for works of water supply—viz., the extension of the scheme which was set on foot two years ago, when a loan of £2,500 was sanctioned to provide a new engine and boilers at the works. The present reservoir holds some 120,000 gals, and it is proposed to erect a second on the Downs near the Derby Arms Inn. The site will cost £500, while an alternative site at Tattenham Corner would cost about twice that sum. The consulting engineer, Mr. George Hodson, said that a site in Langley Bottom, about a mile west of the Grand Stand, would be best for the purpose if another reservoir were needed; but he was of opinion that the present waterworks in East-street were free from pollution, and might properly be extended to the advantage of the ratepayers and on a more economical principle.

## CHIPS.

The new Payne-street Memorial Church Schools' Canterbury, are now completed. The architect is Mr. James Brooks, F.R.I.B.A., of London, and the style is Late Gothic. The ground floor is allotted to the girls' school, and the upper floor to the boys', the entrances being separate. There is on each floor a large room in the centre, 37ft. 6in. by 20ft., and this is flanked at either end by classrooms, 20ft. square. The exterior is of red brick with stone dressings.

The Paris Municipal Council has agreed in principle to the plan for a metropolitan narrow-gauge railway, and has authorised a concession for an underground tubular railway between Vincennes and the Bois de Boulogne, constructed according to the Berlier system.

The monument to Dean Butler in Lincoln Cathedral has been finished, and the unveiling ceremony, which is to be performed by the Bishop of Ely, takes place to-morrow (Saturday).

Mr. J. C. Holder has presented to the Birmingham Art Gallery an oil-painting by Thomas Baker, more generally known as Baker of Leamington. The picture represents a glade in Stoneleigh Park, with a foreground of an old wooden bridge spanning a small stream.

The North Darley schools, near Matlock, are being ventilated by means of Shorland's patent exhaust roof ventilators and special vertical inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The urban district council of Handsworth are about to proceed with the erection of a technical school at the corner of Stafford-road and Golds Hill-road in that town. The architect is Mr. William Henman, of Cannon-street, Birmingham.

The West Riding County Council have instructed Mr. J. Vickers Edwards to proceed with the preparation of plans for blocks for acute cases at Wakefield lunatic asylum, and an asylum for private patients at Scalebor Park.

New Club premises are now being erected in Market-street, Whitworth, near Rochdale, for the Whitworth Conservative Association, from plans and designs by Mr. Norcliffe Mills, architect, Rochdale. The contractor is Mr. Joseph Law, of Whitworth.



## Our Office Table.

THE first of a fresh course of five free lectures to be given at Carpenters' Hall, London, E.C., on successive Wednesday evenings, was delivered this week by Professor Banister, Fletcher, F.R.I.B.A., of King's College, who took as his subject "Timber and Composite Roofs." On Wednesday next, Mr. Thomas Blashill, F.R.I.B.A., superintending architect to the London County Council, will give an address in the same hall on "Shoring," and the arrangements for the following weeks will be as follows:—May 6, "The Setting-Out and Construction of Staircases," by Mr. James Bartlett, the demonstrator at King's College architectural classes; May 13, "The Framing and Construction of Partitions and Floors," by Professor T. Roger Smith, F.R.I.B.A., of University College; and May 20, "Strength and Strains in Wood," by Mr. F. R. Farrow, F.R.I.B.A. The lectures are primarily intended for candidates for the examinations organised by the Worshipful Company of Carpenters, which will be held on Wednesday, Thursday, Friday, and Saturday, the 10th, 11th, 12th, and 13th June.

THE sixteenth annual report of the City and Guilds of London Institute, presented at the meeting held on Wednesday, refers with satisfaction to the great extension which the technical education movement has undergone during the past few years. In London alone the Technical Education Board of the London County Council and the Central Governing body of the City Parochial Charities are spending about £120,000 annually on technical education; and, probably, an equal amount is being spent in the same direction by the Livery Companies of London through the institute or by individual action. They refer to the work now being done on similar lines at the institutes at New Cross and Clerkenwell and at the People's Palace, the Carpenters' Company's schools at Stratford and Great Titchfield-street, and the technical schools and textile departments at Leeds, Bradford, Huddersfield, and other towns in the North of England; and express a hope that the great increase in the educational activity of individual companies may not, lessen, but rather strengthen, the support they give to the institute as the association through which to co-operate in securing for the Metropolis a well-organised system of technical instruction.

A MEETING of the public works committee of the Birmingham Corporation was held on Monday, when it was decided to report to the city council in favour of the scheme of reorganisation of the work of the city surveyor's department, described in our columns in our issue of March 27, p. 472. It is proposed to continue the services of Mr. W. S. Till in connection with the city council, but not in connection with the drainage board, and to pay him a reduced salary of £600 a year, while a deputy or assistant colleague shall receive £400 from the corporation and £400 from the drainage board. This arrangement will involve no increase of costs, Mr. Till's salary hitherto having been £1,000 from the city council and £400 from the drainage board.

A DEPUTATION representing the Leeds and Yorkshire Architectural Society waited upon the committee of the Leeds City Council on Friday, for the purpose of submitting proposals for the laying out of City-square. The members of the deputation were Mr. E. J. Dodgshun (president), Mr. F. W. Bedford (secretary), Mr. George Corson, Mr. W. H. Thorp, Mr. H. Perkin, Mr. G. F. Danby, Mr. W. A. Hobson, and Mr. W. S. Braithwaite. The deputation produced plans and models illustrative of their scheme. The models had been prepared in wax by Miss Laws, of the School of Art, under the direction of the society. One of these showed the whole of the square, with a central monumental group, and the front of the Post-office. Two other models showed alternative designs for the central monument on a large scale. Mr. Dodgshun reminded the committee that the new buildings of the Post-office, being the most important feature of the surroundings of the square, dominate it to a large extent, and the line of its frontage forms a base line from which a central axis can be described for setting out a symmetrical architectural arrangement of the square. To define the outline of this area, it is proposed to erect a low balustraded wall parallel with the Post-office, with two openings

15ft. in width directly opposite its two principal entrances, with raised pedestals on either side, forming bases for electric-light standards, and the north and south ends of the wall curved forward on plan, and terminated by pedestals, surrounded by groups of statuary. The remaining sides of the inclosure could be defined by granite posts, with chains from post to post, with pedestals on either side, surmounted by electric-light standards. It is proposed that a central monumental group of sculpture should form the centre-piece of the square, including an equestrian figure of a pack-horse and rider, and four seated figures—viz., Ralph Thoresby, antiquary and historian; Dr. Priestley, scientist and philosopher; John Harrison (in mayoral robes), benefactor and philanthropist; John Smeaton (born at Whitkirk), engineer of the first Eddystone Lighthouse. For the six bas-relief panels it is proposed to select subjects from the history of Leeds, with some of its old buildings indicated in the background. With the exception of the central monument and some seats, the area of the square would be kept free. The existing Peel statue, being much too small in scale, should be removed to the Victoria-square. Mr. Corson added a few words in support of the proposed scheme. The laying out of the Square would cost between £2,000 and £3,000, and the monumental group would involve an additional £3,000 or £4,000. The chairman, on behalf of the committee, said the matter would receive serious consideration.

THE thirty-sixth annual report of the Amalgamated Society of Carpenters and Joiners, which has its general offices in Manchester, has just been issued by Mr. F. Chandler, the general secretary. During last year the total receipts, including a balance of £74,119 6s. 5½d. from December, 1894, amounted to £195,649 9s. 9½d. The total disbursements reached the sum of £114,226 19s. 2½d., leaving a balance last December of £79,422 10s. 7d. There is thus shown a balance of £5,303 4s. 1½d. in the society's favour on the twelve months' operations, the cash in hand being the highest balance ever recorded in the annual reports. The total worth of the society is shown at £86,578 3s. 7d., or an average per member of £2 2s. 7d. Forty-one branches of the society were opened during the year, and the total membership is now 44,155, or a net increase of 1,114. In the support of unemployed, the society expended £38,646 7s. 4d., or 19s. per member. This was £2,439 less than in the previous year, due to a mild autumn, with a general improvement in trade. Trade privileges cost £6,607 16s. 1½d., or 3s. 3d. per member, as against £9,687 in 1894, and £15,904 in 1893. The general secretary remarks that many of the disputes arose out of the employers' objections to the insertion of a clause in the working rules prohibiting piecework, and the attempted resistance to the introduction of prepared joinery made under conditions which their rules forbade members to take part in. In accident benefit there was paid £1,900, or 11d. per member, as against £2,490 in the previous year. Sick benefit required an expenditure of £28,179 2s. 8d., or 13s. 10½d. per member, an increase of £3,841 on the previous year. The sum spent on superannuation benefit was £10,965 12s. 1½d., or 5s. 4½d., an increase of £1,619. Mr. Chandler urges that, since strikes in the future will tend more and more to be fights to the death, and the society will have no longer the services of duly appointed organisers to help forward the cause of unionism in their trade, the members must resolve themselves into a compact army of organisers.

WE have received a catalogue illustrating the applications of Mason's patent non-slipping stair treads, manufactured by the Safety Tread Syndicate, Ltd., of 15, Barbican, London, E.C., and Glasgow. Our readers have seen, doubtless, the excellent treads for staircases, which have been used so extensively in London and elsewhere, and are to be seen on every step of the Tower Bridge, and used by the Office of Works, London School Board, and railway companies. The treads are formed by a combination of chilled steel, iron, or other hard metal with lead, the lead filling grooves of parallel dovetailed section in the tread of iron. The steel withstands the wear, while the lead gives the foothold. Worn treads can be repaired with these treads; they are perfectly noiseless, as the lead only comes in contact with the feet, and, as far as we can judge, indestructible. For railway stations, schools, factories, and, in fact, all public buildings where the traffic is considerable

and non-slipping steps are necessary, these unwearable treads ought to be used. They are applicable to wood, stone, concrete, and iron staircases, landings, and the same invention is introduced for hydrant and manhole covers, pavement covers and lights. These treads are cheaper than any other tread of the kind in the market.

THE new price list issued by Messrs. Arnold W. Kershaw and Co., consulting engineers, Custom House Buildings, Lancaster, comprises several designs of their well-known pneumatic ventilator, adapted for the roofs and turrets of buildings in every style. It is needless to say the patentees have, by a lengthened experience, been able to perfect the construction of this useful appliance, and to assign to their right position and proportions the deflectors, making the ventilator one of the best and most ornamental in the market. The designs represent Kershaw's plain and ornamental arrangements for ridges; the "concealed" ventilator, which can be introduced between two sides of a roof below the ridge; the patent ventilator for sewers and soil-pipes—a very efficient automatic means of creating an up-current—besides the patent inlet and air-diffuser for rooms; also panel inlets, improved mica outlet ventilators, and patent pneumatic chimney cowls, constructed on similar principles to the pneumatic ventilator. The prices quoted are very moderate. The Kershaw patent pneumatic ventilator has been used by H.M. Office of Works, Navy, and has been largely employed in India, Japan, South Africa, and the Australian colonies.

## CHIPS.

Lord Wolseley will attend the formal opening, on May 23, of the new Volunteer drill-hall at Bournemouth, erected at a cost of £3,000, and presented to the 4th Hants Rifle Volunteers by a Bournemouth lady.

The Highways Committee of the County Council will bring up an important report on the tramways question either next Tuesday or on the following Tuesday. The offers of the syndicate have not been entertained, but the committee will report that the North Metropolitan and the London Street Tramways have jointly agreed to sell their undertakings to the Council at once, and to pay a sum of £600,000 for the fourteen years' lease to be granted to them. This will be equivalent to 9 per cent. on the capital outlay. The committee have also completed negotiations for leasing other tramways, which will return 5 per cent. on the capital outlay.

A memorial to Admiral Sir George Tryon has just been placed in Bulwick Church. It consists of an Elizabethan medallion in white marble, executed by the Countess Fédore Gleichen. This is mounted on a setting of Bolsover stone, carved with naval emblematic designs.

Dean Farrar's fund for the restoration of Canterbury Cathedral, in commemoration of the thirteenth centenary of the baptism of King Ethelbert, next year, now amounts to over £6,500, including a donation of £1,000 from the Ecclesiastical Commissioners as landowners in Kent.

The Hampshire Field Club broke new ground yesterday (Thursday), when a meeting was held in Portsmouth, the proceedings including a short lecture by Mr. Whitaker, the president, on "The Geology of Portsea Island."

The annual meeting of the Durham and Northumberland Archaeological Society was held at Durham on Tuesday. The Rev. Canon Greenwell was again elected president, and other officers were reappointed. The following list of excursions for the summer were agreed upon:—1, Brinkburn, Felton, and Guyance; 2, Kirkheaton, Throckington, and Swinburne; Elwick Hall, Hart, Hartlepool, and Greatham; 4, Crathorne, Hutton, Rudby, Kirkclevington, and Yarm; 5, Brancepeth (afternoon); 6, Kelso, Melrose, Dryburgh, and Jedburgh (two days' excursion).

The nave of St. Andrew's Church, Barnham, Norfolk, was reopened after restoration on Monday week. The church is a very good specimen of a 15th-century Norfolk village church. It consists of chancel, nave, and square battlemented tower. The chancel was restored in 1879, and the nave has now been taken in hand, leaving only the tower to be still accomplished. The cost of the restoration has been £1,000. The architect was Mr. Herbert J. Green, of Norwich.

On Saturday afternoon, about 30 members of the Northern Architectural Association visited the Trinity almshouses and buildings, Quayside, Newcastle. Capt. Crawford acted as cicerone to the party, and explained many objects of interest found in the narrow chare off busy Quayside. The party also visited All Saints Church. Saturday afternoon's proceedings formed the first of a series of outings programmed by the N.A.A. for the summer.



## MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (TO-MORROW).**—St. Paul's Ecclesiological Society. Visit to St. Paul's Cathedral, under guidance of the Rev. L. Gilbertson. 2.3 p.m.  
Architectural Association. Visit to the Coburg Hotel, Mount-street, W. 8.30 p.m.

Edinburgh Architectural Association. Visit to St. Columbus Abbey and Island of Inchcolm. Steamer from West Pier, Leith. 2.45 p.m.

London and Provincial Foremen's Association. Quarterly meeting, Farringdon-road, E.C. 7.30 p.m.

**MONDAY.**—Sanitary Institute. "Principles of Calculating Areas and Cubic Space," by J. Wallace Pegg. 8 p.m.

Surveyors' Institution. "Rivers Conservancy and Pollution," by R. F. Grantham. 8 p.m.

Society of Arts. "Applied Electro-Chemistry," Cantor Lecture No. 1, by Jas. Swinburne. 8 p.m.

**TUESDAY.**—Institution of Civil Engineers. Discussion on "The Works of Water Supply from Thirlmere and Wrynny." 8 p.m.

**WEDNESDAY.**—Society of Arts. "Fruit Drying or Evaporation," by E. W. Badger. 8 p.m.  
Carpenters' Hall. Free Lecture, "Shoring," by Thos. Blashill, F.R.I.B.A. 8 p.m.

**THURSDAY.**—Sanitary Institute. "House Drainage," by W. C. Tyndale. 8 p.m.

## CHIPS.

The Duke of Fife will lay the foundation stone of the new town hall and municipal buildings at Hammersmith on May 7.

The new reservoir constructed for the corporation of Bury, Lancs, at Cloughbottom, will be formally inaugurated on Thursday, May 7.

A new church is about to be built at Stechford, from plans prepared by Mr. J. A. Chatwin, of Birmingham. The total cost of the church is estimated at £4,300, but it is the intention of the committee to at present erect only the chancel and a portion of the nave, which will involve the expenditure of about £2,500.

The watching and lighting committee of Glasgow Corporation have agreed to recommend the corporation to increase the salary of Mr. Paterson, the firemaster, from £500 to £600.

A new hotel in Tempest-hey, Liverpool, was formally opened on Friday. Mr. T. H. Harrison, of Liverpool, was the architect, and Messrs. Brown and Backhouse, of the same city, were the builders.

By his will the late Major John Potts, of Harrogate, has bequeathed a picture representing "Cleopatra going to meet Mark Antony," to the National Gallery.

On Saturday afternoon the foundation-stone was laid of a new church and schools in Park-road, Blackhill, co. Durham. The estimated cost is about £3,000, £1,500 of which has already been raised. The church will be 67ft. by 43ft., and 31ft. high from floor to ceiling. The church will seat nearly 600 worshippers. The schoolroom, which adjoins thereto, will be 49ft. 6in. by 28ft. The buildings have been designed by Mr. George Race, Westgate-in-Weardale, architect.

On Friday Mr. R. Durnford, assistant commissioner, attended at the White Hart Assembly Rooms, Hawes, to hold a public inquiry with reference to the proper site to be chosen for the erection of a new market hall, in accordance with the terms of the will of the late Robert Metcalfe Atkinson, who about ten years ago left £1,500 for that purpose. In November, 1894, a scheme was devised by the trustees for building a new market house for Hawes, to comprise a market hall, reading-room, and coffee-room. Under this scheme the trustees purchased three acres of land, called Burtree Field, as a site. Since then the trustees had come to the conclusion that another piece of land, called the "Up Town" site, would be preferable. Mr. J. P. Kay, architect, of Leeds, in another report, stated that the latter or market-place site would be most centrally convenient and suitable. Some objections had been made by local residents, who had presented a memorial.

The course of lessons in modelling at the Royal Academy Architecture School is terminated for the session, and Mr. Stannus will give a series of demonstrations at 6.15 p.m., on Monday and Thursday evenings as follows—April 30, May 7, 14, 21, and June 1, 4, 8, 11, on "The Orders: in Detail, Treatment, and Application."

A meeting of the Edinburgh Architectural Society was held in Dowell's Rooms on Wednesday week, when Mr. J. N. Scott delivered a paper, "Impressions of Florence," formed during a visit last summer. He described the chief palaces and buildings, illustrating his remarks by photos and sketches made during his stay. Mr. James Hay afterwards read a paper on "The Fireplace," illustrated by sketches.

## Trade News.

## WAGES MOVEMENTS.

THE LONDON BUILDING TRADES.—The men employed in the London building trades have decided to come out on strike on Friday in next week, May 1st, for an advance of wages amounting to 3d. an hour and a new code of working rules. On Saturday afternoon, at the Bricklayers' Hall, Southwark Bridge-road, a meeting of delegates from the various trade unions interested was held in order to carry forward the arrangements for concerted action. According to the latest figures published, the trade unions affected, as far as their London branches are concerned and the number of men in each, are as follows:—Operative Bricklayers' Society, 6,300; Amalgamated Society of Carpenters and Joiners, 5,800; General Union of Carpenters and Joiners, 2,700; Perseverance Society of Carpenters and Joiners, 500; Associated Carpenters and Joiners, 345; National Association of Operative Plasterers, 2,763; Amalgamated Society of House Decorators and Painters, 752; United Operative Plumbers' Association, 925; Millsawyers and Wood Cutting Machinists, 204; General Smiths' and Fitters' Trade Union, 200; United Builders' Labourers' Union, 1,650; General Labourers' Amalgamated Union, 2,400; Navvies' and Bricklayers' Labourers' Union, 1,650; United Order of General Labourers, 900; Gasworkers' Union (Building Trades section), 840; and Amalgamated Plumbers' Mates' Society, 372. The total number of men involved in these and a few smaller unions amounts to 31,411; but there are a number of men, especially amongst the labourers, who are not enrolled in any trade organisation, and a general strike throughout the London building trades would involve 50,000 men. Some of the larger unions have been paying a levy of 1s. per week per member for some time past, in view of a possible strike on the 1st of May.

NATIONAL AMALGAMATED UNION OF LABOUR.—The annual report of this society for the year ending December 31, 1895, states that the year has been a very severe one for all branches of lesser skilled labour. All unions dealing with this class of labour have felt the strain, and very few can report advancement. It is, therefore, considered fortunate if a reaction has been avoided. The difficulty of paying lock-out benefit has been the chief source of trouble. The funds have been depleted very largely by it, and what is worse even than this, the union has lost a great many members and several branches owing to the dissatisfaction caused in its administration. There has, however, been a very large gain as regards hours of labour, and this without a corresponding decrease in wages.

SUNDERLAND.—About 300 joiners connected with the Amalgamated Carpenters and Joiners' Society, and employed in the house-building trade at Sunderland, came out on strike on Friday. Their demand is for 3d. per hour increase, so that they may be put on an equality with the men on the Tyne, who are obtaining 9d. per hour, against 8d. at Sunderland. There are two societies affected by the dispute—the Amalgamated Society of Carpenters and Joiners, and the Associated Society of Joiners, the former numbering about 600 and the other 300 men. Of these, about two-thirds are employed in shipyards; but they have come to an arrangement with the masters, having accepted an advance of 1s. 6d. per week. Although the men belonging to the Associated Society are also agitating for an increase of wages, they have not yet joined the men of the Amalgamated Society. A deputation from the Associated Society waited upon the Masters' Association at the Empress Hotel, Sunderland, on Friday night, and, after a lengthened conference, the masters decided to write to the secretaries of the two associations to the effect that they were willing to submit the matter of an advance to arbitration.

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## TENDERS.

Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**BIRMINGHAM.**—For wiring and fitting of the new general hospital:—  
Birmingham Electric Supply Co., Ltd. (accepted).

**BOURNEMOUTH.**—For painting Bournemouth Promenade Pier. Mr. F. W. Lacey, borough engineer and surveyor:—

	With white-lead paint.	With Calley's Torbay oxide paint.
George and Harding...	£360 5 0	£380 5 0
Dacombe and Son...	350 0 0	350 0 0
New, P. ...	345 10 0	355 10 6
Jenkins and Sons...	292 10 0	303 10 0
Port, A. W. ...	255 10 0	*255 10 0

\*Accepted.

**BOURNEMOUTH.**—For making up Lincoln-avenue and Crabton Close-road. Mr. F. W. Lacey, borough engineer and surveyor:—

Adams, T. ...	£620 8 9
Saunders, S. ...	377 15 0
Saunders, W. H., and Co. ...	323 2 7
Troke, G. (accepted) ...	309 4 11

**Bow, E.**—For internal alterations and fittings at the Duke of Edinburgh p.h., Fairfoot-road, Bow, E. Mr. Fred. A. Ashton, 3, Crooked-lane, E.C., architect:—

Maddison, W. J. ...	£765 0 0
Hearle and Farrow ...	750 0 0
Everard C. ...	719 0 0
Watson, W. ...	648 0 0
Cocks, J. and H. (accepted) ...	569 0 0

**BRISTOL.**—For plant for river improvement works, for the Bristol Docks Committee:—

Accepted tenders:—	
Welded steel pipe for centrifugal pumps:—	
Welded Pipe Company ...	£50 0 0
Six rock drills:—	
Haythorne ...	335 0 0
Three feed-pumps:—	
Mumford and Co. ...	17 18 0
Compressed air pipe:—	
Stewart ...	116 0 0

**BUCKHURST HILL.**—For kerbing and paving and erecting fire-engine station. Mr. H. Tooley, A.R.I.B.A., surveyor to the urban district council:—

Kerbing:—	
Sheean, J., Kingsland, N. ...	£772 12 6
Mackay, J., and Co. Stamford-road ...	763 3 1
Jackson, J., Plaistow, E. ...	759 1 5
Porter, D. H., Queen Victoria-street ...	723 0 6
Adams, T., Green Lanes, N. ...	715 18 8
Wadey, W., Stoke Newington ...	629 0 0
Wilson, G., Walthamstow ...	672 7 7
Griffiths, W., Kingsland-road, N. ...	639 11 0
French, W. and C., Buckhurst Hill ...	596 3 8

Tar-paving:—	
Brunswick Rock Asphaltic Co. ...	1,502 15 9
Wadey, W., Stoke Newington ...	951 6 10
Jackson, J., Plaistow, E. ...	843 19 6
Porter, D. H., Queen Victoria-street ...	731 14 5
Constable, W. E., and Co. ...	678 0 3
Asphaltic Limestone Company ...	630 11 0
Smart, J., Finsbury Park ...	629 15 1

[A second estimate was received from J. Jackson upon modified specification, £756 3s. 7d.]

**Fire-engine station:—**  
Foster, C. S., Loughton ... 244 18 0  
Tavener, H. W., Buckhurst Hill ... 214 0 0

**DARTMOUTH.**—For repairing conduits and gully traps for the town council:—

Smith, E. ...	£31 10 0
Veale, J. ...	30 12 0
Hitt, W. G. (accepted) ...	30 10 6

(Borough surveyor's estimate, £82.)

**DURHAM.**—For additions, &c., to the Criterion. Mr. H. T. Gradon, Durham, architect:—

Wardropper, W. ...	£610 0 0
Caldclough, F. ...	498 10 0
Gibson, C. W. ...	483 0 0
Gradon, G., and Son (accepted) ...	454 0 0

(All of Durham.)



EDINBURGH. For wiring the city chambers for the electric light, for the corporation:—

Lowden Brothers (accepted) ... £188 0 0

EDINBURGH. For the construction of cable tramway tracks, tubes, points and crossings, pits, pulleys, &c., for the various routes of tramways, for the corporation:—

Dick, Kerr, and Co. (accepted) ... £189,720 18 7

FULHAM. For alterations to ground floor, new bars, &c., at the Admiral Keppel, p.h., Fulham Palace-road, S.W., for Mr. E. Levy. Mr. Albert L. Guy, A.R.I.B.A., Bedford-row House, W.C., and 76A, High-street, Lewisham, S.E., architect and surveyor:—

Worsley ... £3,200 0 0

Godfrey and Son ... 3,196 0 0

Todd ... 3,140 0 0

Lasselles ... 3,075 0 0

Courtney and Fairbairn ... 2,885 0 0

Antill and Co., Camden Town\* ... 2,800 0 0

Gas-fitter:—

Dix, G. R., Clerkenwell ... £225 0 0

Paddon, W., New North-road ... £169 0 0

\* Accepted.

GREENWICH.—For sundry repairs to the Pilot p.h., East Greenwich, for Whitbread and Co., Ltd., Chiswell-street, E.C. Mr. Albert L. Guy, A.R.I.B.A., Bedford-row House, W.C., and 76A, High-street, Lewisham, S.E., architect and surveyor:—

Mills, E., Westcombe Park (accepted), £233.

HENDON AND FINCHLEY.—For various alterations and repairs to premises, for the executors of the late Mr. L. C. Cather. Mr. George Hornblower, A.R.I.B.A., 20, Fitzroy-street, W., architect:—

First series:—

Lidstone, N. (accepted) ... £176 2 10

Second series:—

Tout, W. (accepted) ... 860 13 9

HENDON.—For repairs, &c., for Messrs. Marshall Bros., Huntingdon, Midland Arms, and Nos. 1 and 2, Market-place, and livery stables. Mr. George Hornblower, A.R.I.B.A., 20, Fitzroy-street, W., architect:—

Tout, W. (accepted) ... £257 3 0

HENLEY.—For the erection of hotel, stabling, and shops at Henley-on-Thames. Mr. W. Theobalds, architect. Quantities by Messrs. Hedis and Wrightson:—

Stokes, Reading ... £17,598 0 0

Chinchen, Bournemouth ... 16,000 0 0

Bloxham, Banbury ... 15,258 0 0

White, Bedford ... 14,813 0 0

Parnell and Son, Rugby ... 14,318 0 0

Peters and Son, Horsham ... 13,577 18 0

Lasselles, London ... 13,538 0 0

Kingerlee, Oxford ... 13,328 0 0

Gibson, High Wycombe ... 12,708 0 0

Hughes, Wokingham, Berks.\* ... 12,630 0 0

\* Accepted.

ISLINGTON. For wrought-iron railings and gates at the Northern Polytechnic Institute, Islington. Mr. Charles Bell, F.R.I.B.A., 3, Salters' Hall-court, Cannon-street, E.C., architect:—

Willcockson and Co. ... £285 0 0

Lockerbie and Wilkinson ... 300 0 0

Smith, C. and F. ... 220 0 0

Jones and Willis ... 207 0 0

Hart, Son, and Peard ... 202 0 0

Tompkins, J. B. ... 193 0 0

Clarke and Sons (accepted) ... 160 0 0

ISLINGTON.—For heating by steam at the Northern Polytechnic Institute, Islington. Mr. Charles Bell, F.R.I.B.A., 3, Salters' Hall-court, Cannon-street, E.C., architect:—

Cannon, W. G., and Sons ... £1,231 0 0

Rosser and Russell ... 910 0 0

Wenham and Waters ... 819 0 0

Clarke and Sons (accepted) ... 760 0 0

ISLINGTON.—For electric lighting at the Northern Polytechnic Institute, Islington. Mr. Charles Bell, F.R.I.B.A., 3, Salters' Hall-court, Cannon-street, E.C., architect:—

Fearnhead, A. ... £1,027 0 0

Strode and Co. ... 419 0 0

Crompton and Co. ... 407 0 0

Farnley and Son ... 340 0 0

Vaughan and Brown ... 306 0 0

Wenham and Waters ... 245 0 0

Russell and Lennard (accepted) ... 219 0 0

LEWISHAM.—For the building of chimney-shaft on ground in Molesworth-street, Lewisham, belonging to the Lewisham Board of Works, for Mr. Samuel Willoughby's dust destructor. Mr. Albert L. Guy, A.R.I.B.A., Bedford-row House, W.C., and 76A, High-street, Lewisham, S.E., architect and surveyor:—

Shubert ... £793 0 0

Jerrard ... 767 0 0

Simmonds, G., and Son, New Cross\* ... 749 0 0

\* Accepted subject to revision.

LEWISHAM.—For sundry repairs and decorations to the Lewisham Conservative Club, for the directors. Mr. Albert L. Guy, A.R.I.B.A., Bedford-row House, W.C., and 76A, High-street, Lewisham, S.E., architect and surveyor:—

Bennett, Lewisham (accepted).

LONDON.—For repairs and reinstatements to the church of St. Mildred, Bread-street. Mr. C. Innis, 27, Queen-street, City, architect:—

Mansfield and Son ... £204 0 0

Lawrance, E., and Sons ... 780 0 0

Colls and Sons ... 775 0 0

Prestige and Co. ... 728 0 0

Dove Brothers ... 685 0 0

Braham Brothers ... 683 0 0

LONDON.—For a new Section House at Albany-street, for the Receiver for the Metropolitan Police District. Mr. J. Dixon Butler, architect. Quantities by Mr. W. H. Thurgood:—

Grover ... £6,760 0 0

Holloway Bros. ... 6,750 0 0

Perry and Co. ... 6,725 0 0

Scrivenor ... 6,690 0 0

Lawrence ... 6,687 0 0

Richardson ... 6,667 0 0

Ansell ... 6,665 0 0

Higgs and Hill ... 6,634 0 0

Lathey Bros. ... 6,497 0 0

Messum ... 6,477 0 0

Chessum ... 6,439 0 0

Willmott ... 6,084 0 0

LONDON.—For alterations and additions to business premises, 7 and 7a, Suffolk-lane, E.C. Mr. Chas. Bell, F.R.I.B.A., 3, Salters' Hall-court, Cannon-street, E.C., architect:—

Green, H. J., and Co. ... £468 0 0

Anley, J. ... 424 0 0

Bentley, J. (accepted) ... 424 0 0

MARYLEBONE.—For boundary wall, &c., at the St. Marylebone Cemetery, East Finchley, N.W. Mr. A. Saxon Snell, F.R.I.B.A., architect. Quantities by Messrs. Northcroft, Son, and Neighbour:—

McCormick and Sons, Essex-road ... £4,567 0 0

Bird, S. G., Upper George-street, W. ... 4,403 0 0

Simpson, J., and Son ... 4,346 0 0

Leslie and Co., Ltd., Kensington-sq. ... 4,332 0 0

Patman and Fotheringham ... 4,309 0 0

Wall, Charles, Chelsea, S.W. ... 4,273 0 0

Cowley and Drake, Willesden Green ... 4,250 0 0

Wall, H., & Co., Kentish Town\* ... 4,087 0 0

\* Accepted.

MARYLEBONE.—For wrought-iron railings and gates at the St. Marylebone Cemetery, East Finchley, N.W. Mr. A. Saxon Snell, F.R.I.B.A., architect. Quantities by Messrs. Northcroft, Son, and Neighbour:—

Potter and Sons, Oxford-street, W. ... £1,240 0 0

Lindsay and Co., Paddington, W. ... 988 10 0

The Horwely Co., Westminster ... 895 0 0

Berry and Sons, Westminster, S.W. ... 885 0 0

Young and Co., Pimlico, S.W. ... 883 10 0

NEWQUAY.—For building a police-station at Newquay, for the Cornwall County Council:—

Miners, Geo., Marazion (accepted).

NORWICH.—For making-up Lower Clarence-road. Mr. Arthur E. Collins, city engineer:—

Hobman, A. C. W., and Co., South

Bernondsey ... £1,138 0 0

Smith, J. S., Norwich ... 1,099 5 10

Read, W. A., Norwich ... 1,050 0 0

Botterill, W. J., Aylsham ... 952 0 0

Rackham, G., Colchester\* ... 893 0 0

\* Recommended for acceptance.

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## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2156.

FRIDAY, MAY 1, 1896.

## MAY MORNING.

IT is nearly two centuries and a half since Mr. Pepys, travelling on May Day from Mincing-lane to Westminster, met "many milkmaids with garlands on their pails, dancing, with a fiddler before them." It is still longer, perhaps, since the great maypole in Leadenhall-street was last set up, which for the rest of the year used to lie along on the ground near the corner of St. Mary Axe. Even the companies of sweeps, each with a "Jack-in-the-Green," who, in the childhood of the passing generation, pervaded London streets on this anniversary, have disappeared. There is still singing on Magdalen College Tower to-day; but the village children, who used to go from house to house with music, have grown up, and left few successors. "Bringing in the May" is only a subject for painters. No "budding boys and girls have come, Back, with whitethorn laden, home." No longer on this day "does each field turn a street, each street a park, made green, and trimmed with trees." We are not wise enough to "take the harmless folly of the time." We "grow old apace and die, before we know our liberty."

Liberty, indeed, is the very thing we are ceasing to know. We live in the age of pettifogging laws and microscopical transgressions. Ours is the era of "Must not walk on the grass." We are encompassed with a twopenny tyranny. If a Scotch mountain has anything interesting about it somebody turns it into a deer-forest, and puts up notices that trespassers will be prosecuted. The same amiable notification may be seen in almost every English wood or copse that tempts the traveller with a glimpse of unspoiled Nature. It does not keep out roughs. Their destructiveness is the excuse for the rules and regulations which we are never out of sight of; but their contempt for rules and regulations is so supreme that they do not even take the trouble to read them, and laugh at them. Whether they come down from the Midland towns in armed gangs to carry off pheasants and partridges, or whether they only arrive from White-chapel with trowels and baskets to grub up primroses, it takes more than boards and paint to stop them. The people who are stopped are just those who would have done no harm. They, in the language of an old writer, are "well snibbed" at every turn. They are fair game for every clown in uniform, and for the boards and councils who hire the clowns, and encourage them to harry the public.

Under such conditions as these, the old pleasures of May Day have become inconceivable. The youths and maidens of whom Herrick sings, instead of bringing home their boughs, would now, if they tried to get them, spend their afternoon in police-cells, or be bailed out, amidst tears and reproaches, by their friends. And even if it were not so, none of them, unless perhaps the very poor, would dare to show their joy. Happiness, we have discovered, is not in good taste. We pass our lives in grinding and being ground. Our very holidays are not an escape from this; they are only a "grind" of a different sort. We want to revive art, and all the while we have lost the impulse from which art springs—the impulse of overflowing gladness. We set about the revival with all the earnestness of our nature. There is a firm determination in us: we will be artists, or perish in the attempt. But it is not in this way that artists are made. The clumsy

young German whom Boswell tells us of, determined to be light and gay and lively, like the Frenchman with whom he had become acquainted. He set about it seriously and methodically, just as the modern Englishman sets about being a painter, or a sculptor, or an architect. The people with whom he lodged heard strange noises in his rooms, suggesting that he was in an epileptic fit. They went up, and found him diligently jumping over chairs and tables; and when they asked him why, he replied "*J'apprends d'être vif.*" So the English art-student learns, or tries to learn, to be "*vif.*" So he seeks, by labour and pains, to produce imitations of the beauty and grace which, when men had moments of happiness and freedom, flowed spontaneously and without an effort from their freedom and happiness. Sometimes the imitations are good; oftener they are poor; but sooner or later we feel that there is no heart in them. In the long run, the delight of those who behold a work of art is only the transferred delight of the man who made it; and modern life is so arranged that delight on his part shall be a very exceptional thing.

Society, this month, puts on a great air of being interested in art. It goes to the Royal Academy, and admires, with effusion, whatever its morning paper assures it is admirable. It picks up a few technical terms, and discusses this picture and that, as if it really knew and cared about such things. Most of this is mere pretence. It is proper, just now, to talk about painters and their works, and, unfortunately, you can hardly talk of them without having gone to Burlington House and having seen them, though it is a terribly tiring thing to do. Well, England expects us all to do our duty—and a great relief it is when we have done it, and know that we shall not be worried about it again till next year. That is the sort of spirit in which the British public welcomes the productions of its painters, and sculptors, and architects for the previous twelve months. It endures them rather than enjoys them. Now and then comes someone with a real love of art, and once in a while he chances on the work of a real artist. It is one of the golden moments of his life, and he tells others of it. They go, too—trying to see and feel as he did; but few of them do, though nearly all pretend they did. They do not laugh in each other's faces. They do not say, "We are all hypocrites together." They do not ask, "Why should we weary ourselves by going through this dreary performance, when we all see clearly enough through it, and through each other?" They take their penance manfully—a penance relieved by gossip about their acquaintances, and criticisms on their acquaintances' bonnets and the like. These are the things which really do awaken their slumbering sympathies, and it is these, and not the pictures, which they will finally remember. So the Continental tourist forgets his palaces and his cathedrals, but can tell you, to his dying day, what sort of hotel he stayed at, in Venice or in Rome, and what sort of dinners they gave him there.

The sum of it is that a great deal of what passes for art work is mere drudgery, and that a great deal of what passes for admiration of it is mere hypocrisy. It was not so when architecture and its allied arts really flourished. The makers pleased themselves, and, doing so, they pleased the world. There were times once, though we can hardly realise it, when men cared for architecture, and painting, and sculpture, as much as they only care for money now. And there were times, too, when people really used to be happy. They had rain, and frost, and snow in full measure, as we have; but there were bright days now and then when the sun came out, and then they rejoiced, and were not ashamed of it. Those days are past. We have been taught, our ancestors for three centuries or so have been taught, to

take life with unspeakable seriousness. The ideal set before us has been all work and no play. Now, even when we try to play, we turn our play into work. We have lost the art of relaxing ourselves. We are always on the stretch—if not at the labour we call work, then at the labour we call amusement. But it does not answer. If we produce more in quantity, we produce what is infinitely poorer in quality. We shall never get right again till we have intervals of real rest, till we are not too proud to enjoy ourselves in due season, till we learn how to throw off our cares and ambitions for an hour or two, and; like our forefathers on May morning, "to fleet the time carelessly, as they did in the golden world."

## PICTURES AT THE ROYAL ACADEMY.

[FIRST NOTICE.]

ALTHOUGH we miss the presence of the many scholarly and finished canvases of the late President, and begin our survey of this year's Academy with a sense of the loss of a presiding genius, the walls of Burlington House still present to the eye of the visitor the accustomed wealth and variety of subject and style. The traditional methods of English painting, of course, predominate. We see few works of the advanced school of impressionists, though the more moderate adherents of the style are beginning to make themselves felt. Landscape and portraiture are as usual largely represented in the galleries, and of the latter it may be said that a greater freedom exists in the choice of methods of handling, and background. The flat Holbeinesque style is asserting a position by the side of the more solid and modelled manner, as we see in the fine specimens of portraiture by Mr. John Sargent in this and the New Gallery. Our present survey is as usual necessarily a very brief and rapid one, and we can only give the reader a very general idea of the leading pictures in the first three galleries. Sir J. E. Millais, Bart., the President, who contributes five pictures, mainly portraits, has, in Gallery I., a subject-picture entitled "A Fore-runner" (22), representing St. John the Baptist in the wilderness, who is making into a cross a rough staff. The Baptist is shown in the Scriptural garb, earnest and devotional in the expression, and these simple elements have been painted with masterly power and directness. Above it, St. George Hare sends a portrait of a pretty little bridesmaid in smock dress of delicate greenish-blue shade. F. D. Millet (4) has a delightfully-painted *genre* picture, "Lucky at Cards; Unlucky in Love"—two men playing at a table, while a pretty-faced maid in pink frock and white apron watches the game. We can now only barely glance at the landscapes in this gallery. Arthur A. Friedenson's sunny "Meadow Stream," and the vigorous upright picture of John Finnie, "An Unprofitable Corner," show a luxuriant growth of flowering weeds at the corner of undulating land, the composition, colour, and handling being very pleasing and vigorous. James C. Hook, who sends two subjects, has in this gallery the smaller picture, entitled "A Dish of Prawns" (48). Of course, it represents a rocky Cornish coast, where the sea is of that pure freshness and blue colour suffused by sunlight so charmingly rendered by this master of the far west of Cornwall. Here the tints are of that strong, sapphire-like hue which is to be found only in the far west. The scene represents, as usual, one of those coves between grey and bluish slate rocks, with verdure-clad cliffs in strong sunlight. Two girls animate the rugged scene, diversified by boulders, lichen, and seaweed. One is clad in a purplish-rose garment, which forms a strong contrast to the blue and grey stones; she sits on a rock, and is engaged in catching



prawns. The sunlight on the sea, the golden sands, the shining, slaty rocks, and the limpid water of the pools and cove, in which are reflected all the hues of the sky, are wonderfully true to nature, and the scene is full of light and air. H. H. La Thangue, whose powerful realism is never so happily expressed as when employed in painting the toiling peasant's daily life, sends two or three subjects of this kind. "A Little Holding" (57) represents the garden of a farmhouse. Through the branches of a thickly-set orchard of trees patches of flickering golden sunlight are cast upon a flock of ducks, which are eagerly making their way to a dish of water. A splendid example of landscape is John MacWhirter's "Bonnie Scotland." The hills and distant sea are painted with wonderful colour and atmosphere, near which David Murray has a very charming landscape, "Musk Mallow"—a sunny meadow dotted over by the fragrant plant, the colour of which makes a contrast with the deep blue sky. W. Q. Orchardson's "Reflections" is one of his delightfully-toned drawing-room scenes. Standing before the mirror over a console table is a fair-haired and elegantly-attired young lady, who holds a magnificent bouquet in her hand, in a kind of thoughtful trance. The tones of amber and blue in the delicate dress, and the rose-coloured carpet, make a singularly effective chromatic harmony.

We must note a few notable portraits. J. S. Sargent's full-length portrait of "The Right Hon. Joseph Chamberlain, M.P." (64) is a very excellent likeness of the Secretary for the Colonies; but it is more than this: the painter has caught the lineaments and mobile characteristics of the man. Henry T. Wells has two portraits of ladies, "Mrs. T. A. Mason" (56), and "Miss Ethel H. Davis" (76), the latter a very pleasing piece of characterisation and handling. Luke Fildes has a portrait of "Mrs. Stuart M. Samuel" as "The Shepherdess," and we notice a very lovely face in that of "Miss Mamie Bowles" (2) by Maurice Greiffenhagen. Amongst subject-studies we must place Albert W. Holden's decoratively-handled figure of the Virgin, "The Annunciation" (66), and a few others to which we must again refer next week. In the next gallery, the picture which occupies the central position is a large landscape as a background to the serio-dramatic subject depicted, "Back to Life" (121), by Hubert Herkomer. The scene, looked upon as a landscape, has merits. It represents a village lane, by one side of which flows a limpid stream, while on the other side are a few humble cottages, backed by rising wooded ground. The centre figure of the whole is a young, pale-faced sickly little girl with blue eyes, which seem hardly able to bear the strong light, and who already feels the fatigue of her first walk from the sick-room, resting on a chair, and supported by a district nurse, who has taken out the child after a long illness. In this position an aged and motherly woman of the village, and others displaying more or less sympathy or inquisitiveness, are watching the little invalid. No doubt there is a powerful, pathetic chord of human emotion awakened by the scene; the faces of the bystanders and the attentive nurse, as well as the little invalid, being painted with realistic force and tenderness. Yet the subject is not, perhaps, the most pleasing that Mr. Herkomer could have selected. H. H. La Thangue's "In a Cottage Garden" (89) is another piece of rural life, which, in its vigour and powerful realism, cannot fail to arrest attention, though very simple in its incident. An industrious housewife is engaged sawing a large branch of a tree for firewood in a garden, suffused by the warm glow of an evening sunlight. Next we have a very noble portrait of "Albert Gilbert, R.A.," by G. F. Watts, R.A., as admirable

in its delineation and handling as it is exquisite in colour. "A Sacrifice to Dionysus" (95) is cleverly conceived in its main elements: the painter, James Archer, represents one of those sacrifices in which the vital generative principle of nature was typified. Luke Fildes' portrait of "Mrs. Frank Bibby" is a charming study of a lady in pink dress, graceful in posture, and reminding us of one of Reynolds's works, in which a background of trees is introduced. Arnesby Brown's "Homeward" is a delightful rendering of misty evening light. Stately leafless trees, through which the moon is seen, forms the background of a meadow through which cattle are leisurely wending their way home through the gate. In a different key, refulgent with the golden rays of the setting sun, is John MacWhirter's "Golden October." The President has in this gallery a portrait study of the Hon. John Nevile Manners, a little boy in scarlet velvet tunic, seated on a country bank at the edge of a wood. The child-like attitude and simplicity of manner are happily associated with the rural setting and honeysuckle which hang over the boy's head. Herbert J. Draper's graceful figure of a girl in auburn hair adjusting a gold chain (144), and the harmony of golden hues with the black dress, make a pleasing study. One of Alma-Tadema's contributions, "Whispering Noon" (164), shows some fair classic maidens in delicate draperies seated on a white marble bench near a fountain; beyond are seen the rich purple blossoms of trees and a glimpse of sea. But his chief contribution is in the Third Gallery, and goes under the name of "The Coliseum." The great amphitheatre covers a large portion of the small canvas; below and around the building one sees crowds of well-dressed Roman patricians who have come to witness one of the great spectacles. The main feature of the subject, however, occupies the immediate front of the picture, one of those translucent marble alcoves or balconies, which the painter delights to depict. Large tazzi, festooned with yellow flowers, stretch from vase to vase, and on a cushioned seat is a fair-haired lady with a little girl, whose dark attendant behind is holding her back. The lady and little girl are looking over the balcony and down on the terrace below. They are clad in delicate draperies, of bluish-grey and rose, subtle and delicate in its technique and harmonies of colour. The picture has all those qualities which render Mr. Alma-Tadema's work so singularly attractive, if without any higher meaning or interest. A saddened interest is awakened by the picture of the late President, evidently unfinished—the one on which he was engaged when he died, and which occupies the accustomed place of honour in the centre of the opposite wall. It is called "Clytie." The scene is a verandah or portico of an Ionic temple, the distant hilly landscape beyond. The beautiful daughter of Oceanus is kneeling in an imploring attitude, her face uplifted towards the sky, her head thrown back, the tresses of her auburn hair falling down over her shoulders. She holds up her hands to heaven. Beside her, near the base of a fluted Ionic column, is an altar laden with pomegranate and other fruits. Although unfinished and wanting the polishing touches of the master, the modelling of the limbs, and the transparency of the draperies, there is much fervour of expression and beauty in the figure of the suppliant, who is pleading for some gift. The classical myth has it that owing to her desertion by Apollo she pined away, and was turned into a sunflower. The picture somewhat suggests the metamorphosis referred to. The deep citron and golden hues of the draperies, the dark landscape, and the luminous clouds are very rich and resplendent.

W. Q. Orchardson's imposing seated por-

trait of "David Stewart of Banchory, Lord Provost of Glasgow 1889-1895," in his scarlet robe edged with sable fur, is a large and striking picture possessing high qualities of portraiture. Near it B. W. Leader has one of his great landscapes, "A Golden Eve" (184). It is the outskirts of a forest, the trees illumined by the golden rays of the setting sun, the trees and sky being mirrored in a pond of placid water. Frank Dicksee has in his picture, "The Mirror," again presented us with an Oriental beauty seated in a chair enriched by mother-o'-pearl. The maiden is looking into a hand-glass, which she holds before her face, arrayed in all the resplendent fabrics of the Eastern loom. There is a mystical beauty and meaning in this work, in which colour and imagery play an important part. We come to another of John MacWhirter's noble landscapes in "The Sleep that is Among the Lonely Hills" (208), a valley between hills of deep blue and purple, over which the darkness of night has fallen. An uprooted tree in the foreground suggests the destructive force of the hurricane. G. F. Watts's picture, "The Infancy of Jupiter," is a masterly composition: the undraped figures which are gathered round the infant god on a hillside, doing him homage, are drawn and modelled with wonderful power, and the flesh-tints, if a little coppery in tone, are rich, and make a strong contrast with the dark, wooded background. One of Sir John Millais's great works hangs in the centre of opposite wall, and is a splendid portrait of the "Marchioness of Tweeddale," whose beauty is acknowledged. The marchioness is seated, and wears a black satin dress with low-cut bodice. Over her shoulders hangs a cloak of rich plum-colour velvet, edged with sable, and the figure is set off by a background of tapestry. This year J. W. Waterhouse paints "Pandora," in which this reputed gifted and beautiful woman, the first mortal woman that ever lived, according to Hesiod, is shown by the side of a stream in a dark wood, peering into the beautiful golden casket which Jupiter gave her. The lid of the box is partly opened, and the legendary evils which were said to have been dispersed over the world are issuing forth in the form of a bluish vapour. The depth of deep blue so affected by this painter, and the treatment and handling, impart a mystical meaning to the subject. Other pictures we shall notice next week.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—I.

MOST of the work shown this year in the Architectural Gallery is, at least, interesting, and its general character may, perhaps, on the whole, be described as really good, although there are fewer distinctive and out-of-the-way, not to say novel, designs shown in the room than usual. The average merit of ordinary work seems higher, however, and this, after all, is the most satisfactory standard to be enabled to record; nevertheless, the seeker after novelties, and the searcher after a new style with which to distinguish the declining years of the nineteenth century, will look in vain through this collection. They will miss, too, with advantage, a few of those queer grotesque attempts after originality which on some occasions have been admitted for exhibition on these same walls. It is a matter of regret that so few of the architect members of the Royal Academy are adequately represented in the present exhibition, Mr. G. F. Bodley only having one little drawing, and neither Mr. J. L. Pearson nor Mr. Norman Shaw being represented at all, while the two associates—Sir Arthur Blomfield and Mr. T. G. Jackson—show nothing. Mr. Alfred Waterhouse, R.A., makes amends for his single exhibit of last year by contributing three characteristic works on this occasion (of these we shall



say a few words later on), and Mr. George Aitchison contributes in one frame two scale designs for the alternative treatment of the Academy entrance-lobby pavement—one in mosaic, and the other in marble inlay. Some of the more important competitions of the last twelve months furnish several of the drawings here brought together, and among these the foremost in importance are the Royal Insurance Buildings at Liverpool, of which we give illustrations to-day. The selected design, by Mr. J. Francis Doyle, of Liverpool, is accorded the place of honour at the end of the gallery, while right and left of it on the same wall are shown the designs for the same building by Mr. Edward W. Mountford and Mr. John Belcher, the exterior perspective of the last-named being reproduced among our lithographic plates herewith. Striking as both these two unsuccessful designs undoubtedly are, there can be no question in impartial minds that Mr. Norman Shaw made the right choice when he awarded the prize to Mr. Doyle. That Mr. Mountford merited the second premium is so far evident, and the upper part of his façade certainly ranks among the best things which he has hitherto accomplished, even if we may be pardoned for having mistaken this design of his for Mr. Colcutt's. The entrance and ground floor stage appears, to our judgment, the weakest part of the composition: it is, for one thing, too overdone with surface ornament above the stilted arches of the lower windows. The Ionic columns blending into the wall and reveals of the upper tier of fenestration, and tucked-up as it were under the eaves cornice, seem to us to be very pleasing and broadly handled. Mr. Alfred Waterhouse, R.A., in "The Christie Library," Manchester, has designed a group thoroughly in accord with the other buildings of Owens College with which this block is connected by an arched gallery of wide span. The rebuilding of University College Hospital in Gower-street, shown by No. 1687, will be a relief to that direful of all thoroughfares wherein some of the residents, to avoid monotony, have indulged in a variety of knockers, and one individual obtains a sort of distinction by placing the number of his house in the middle of one of the four panels of the front door. Mr. Waterhouse gives us a cruciform building rising diagonally with the four surrounding streets into a picturesque and suitable scheme of well-lighted and admirably isolated wards. The entire area of the site is covered on the ground floor level, and above this large flats or airing areas are contrived, approached by wide steps from the ground level. His bright and luminous water-colour sketch illustrating this work is somewhat crushed by the ponderously heavy but unquestionably clever pastel cartoons sent by Mr. H. Wilson, of St. Augustine's, Highgate, and the Lady Chapel, St. Martin's Church, Marple. The contrast between the Royal Academician's work just named and these exhibits is too serious to be amusing, and while we admit the ability and sense for colour which these chalk studies evince, we think they are after all quite out of place in the Architectural Gallery. The buildings can never look like these representations of them. St. Augustine's west front will not be constructed of mud, and it is folly so to show it, as is here the case. Strip the design of this furtive mannerism, and it will look far less poetic, much more matter-of-fact and thoroughly hard, at least, till time has made its imprint, and toned down the inevitable angles. Deceptions at best are not good, and however able Mr. Wilson may be, we doubt his taste in this matter. He obtains a good advertisement with posters of such merit, but they are neither architectural nor truthful delineations of architecture, for all that. Mr. Waterhouse's Bank, Park-row, Leeds, is his third building, and we hope to illustrate all three works shortly. The pulpit from Canterbury Cathedral, by Mr. G. F.

Bodley, A.R.A., has a flatly-treated baldachin, with a Perpendicular or Late Tudor tester, deep in members of open work and richly carved. The rostrum faces south, against one of the nave piers, and at the foot of the wooden stair, located southwards, is a bold figure of St. Augustine standing on the newel. The balusters are flatly carved planks, and the supporting shaft under the pulpit is also of oak. Mr. Aston Webb is only represented by two small houses this year. One, "Windermere," Blackheath, hangs on the line, and the other is too near the sky to be seen in detail. Both, of course, are quiet, crisp in design, and suitable. Messrs. Gibson and Russell are in evidence by two drawings of their Technical Institute at West Ham, of which full illustrations have already appeared in our pages, and they show their West Riding County Council buildings at Wakefield. Mr. J. M. Brydon sends his queer design for the Technical Buildings at West Ham, and among other competitors represented here from the same contest are Messrs. Edwin T. Hall, Newman and Newman, besides Messrs. W. H. White and T. Moore and Mr. C. Coggin. Some of the best designs are, however, not shown at all. Messrs. Ernest George and Yeates are represented by only one drawing, a house in Norfolk; this is typical of Mr. Ernest George's best manner, with long horizontal lines relieved by gables and towers—a home of sufficient dignity, and tastefully devoid of ostentation. Mr. William Emerson displays his façade for St. Mary's Hospital, Paddington, to be known as "The Clarence Memorial Wing." The skew-set turret over the central compartment serves to impart novelty, and the open loggia arcades to the wards increase the interest of the shadows of the front. The Hall of Maer Hall, Staffordshire, is but part of the additions which Mr. J. Francis Doyle has carried out (1587-1589), as shown by the general view of this mansion hanging hard by. Mr. J. MacVicar Anderson's single contribution is skied, and we can hardly wonder why, when its detail is examined. These new offices for the Commercial Union Assurance Company, Cornhill (1629), make an expensive, ornate, and commonplace building, with pilasters introduced to emphasise the intermediate pavilion projections, and none to terminate the limits of façade itself. In the central portion coupled columns serve to give a degree of richness, but they add little interest. "Rosehaugh," Avoch, N.B., is a big Scotch house after the French chateau type, by Mr. William Flockhart, and Mr. W. H. Seth-Smith shows a group of well-drawn, quiet-looking stables and cottages at Waxwell Farm, Pinner. Mr. J. J. Stevenson is represented by his unsuccessful design for the Presbyterian College at Cambridge. The drawing is too high up to be closely examined, but the quadrangle seems rather more like University work than the author has exhibited before. Mr. Basil Champneys sends a framed working sheet of elevations for a house at Heathfield, Sussex. Mr. Maurice B. Adams contributes the Lord Leighton Memorial buildings, "The Passmore Edwards South London Art Gallery and Technical Institute," Peckham-road, of which we gave a double-page plate on April 10th. The interiors of Stafford municipal buildings are the chief work shown this year by Mr. H. T. Hare, and Mr. Charles Barry sends similar views of a very different design, the Institution of Civil Engineers, Great George-street. These last-named drawings are too near the ceiling for inspection; but we should imagine that the inside of this building would be better than the exterior, which we certainly do not like: and as for Mr. C. Harrison Townsend's chrome-coloured façade for the design of a picture gallery in Whitechapel, both the building and the blue sky over it look imported from the Tropics. No one would fancy the building could be intended for Whitechapel. Mr. Cyril E. Power seems

to be busy at St. Cuthbert's Church, Earl's Court, which he is finishing and altering, if we may judge by these drawings, 1640, 1660, and 1756. Messrs. James Brooks and Son send two perspectives seen more than once before—viz., All Hallows, Gospel Oak, and St. Andrew's, Willesden. The Passmore Edwards Settlement Buildings competition design is shown (1733), and below this the amended façade obtains a position; but we much prefer the original elevation. Messrs. A. D. Smith and C. C. Brewer are the architects. Mr. A. E. Street has a poor thin water-colour of the Chapel of St. Margaret's, East Grinstead, a pretty little building of good detail. Mr. Paul Waterhouse has a quaint study in elevation of some almshouses at Darlington, with cut yews and Dutch gables of much fancy. Mr. Charles F. A. Voysey sends some of his rough-cast plastered country cottage-like houses, with red pots, and red curtains to the windows—the only spots of colour—set off by green slates and green painted woodwork. His wall-paper designs hanging near are very pretty. Mr. William Young's sole drawing is the Entrance Hall, Panshanger (1595), a Classical interior representative of his style.

#### THE NEW GALLERY.

FOR its general tone of superiority, the New Gallery holds its own. All schools of English painting may be said to be here represented, for we not only see the pre-Raphaelite and the impressionist, but devotees of the more popular methods. Beginning in the South Room, we have George Hitchcock and J. MacWhirter, R.A., Miss Marianne Stokes, and James Orrock. Of the first named, his "Dream of Christmas" (5) is sufficiently devotional in sentiment to redeem it from any qualms we may have of its meaning. There is refinement of drawing in the lonely figure of the Virgin seated by the roadside, covered with snow, and delicacy in the twinkling light in the distance. Above hangs a circular-framed composition of decorative character, by W. Graham Robertson, "The Queen of Samothrace." The idealised queen sits on a throne, wearing a crown of emeralds, a robe of blue brocade, and having a cloak of green. Her face is of a beautiful regular type. The colour is rich, almost redundant, in its brilliance. The figure portrait, by W. E. F. Britten (2), in pastel, is charming in colour. Edgar Barclay has a well-composed and skilfully-painted *genre* picture, "Parental Anxiety" (7), a girl feeding ducklings, and J. MacWhirter, R.A., has a fine landscape, "Highland Cattle and Highland Weather," replete with the painter's powerful delineations of atmospheric phenomena. Quaintly clever and Medieval in its conception is Mrs. Marianne Stokes' picture of "The Page," and there is refinement in the drawing and colour. We must commend Colin Hunter's fresh seascape, "Claiming a Drifted Log" (12), for its strong colour, and Edward H. Fahey's noble landscape, "Monksdale, Derbyshire." A few good portraits are hung. J. J. Shannon, A.R.A., has an excellent portrait of Lady Mappin. Two large landscapes by Professor Giovanni Costa are hung, both of them examples of the painter's style—flat and uninteresting, and both in a low key of colour, as "The Sleeping River" (34), which is very mannered. Henry J. Ford has produced a strange, weird fairy romance with much fervour in "The Witch Maiden" (45), the story being suggested by the tale, "The Dragon of the North." Puzzling and mystical is F. Khnopff's "Des Caresses" (38), a youth in Greek dress caressing or listening to a sphinx-like creature with panther or leopard's body. Very crude in colour and execution is Charles M. Gere's "Chaucer's First of May" (50). The girls merry-making with garlands of flowers in a sunny glade, watched by the youthful poet, who is reposing on



the sword beneath some trees, make a pleasant composition. "Calm Decay," by Edward W. Waite (56), is an old barn by the side of a stagnant pool overgrown with thistles and vegetation, a picture of neglect. The painter has very feelingly and delicately handled his subject and inspired it with a poetic charm. Of idealistic work we must take recognition of William Wontner's fair "Enid," a charming personification delicately treated. Passing to the West Room, G. F. Watts, R.A., has four pictures of considerable power and beauty of colour. His "Earth," symbolised by a ruddy or copper-coloured woman of a matronly type holding in her bosom the fruits of the earth, is less successful than the next picture, "Time, Death, and Judgment," each of these being allegorised by figures of noble drawing and colour. The composition looks like a variation of the larger picture of the same subject at South Kensington. In this one the figure personifying "Judgment" is in a background of radiant clouds, holds a huge sword. The figure of Death, a pale beautiful woman robed in white, in the folds of which are drooping flowers, stands next to "Time," a swarthy young man who has the emblem of fleeting time in his hand. For composition and colour, this effort is equal to any of Mr. Watts' later works. His companion pictures on the opposite wall, illustrating our First Parents before and after the Fall, are finely conceived, in good colour, if somewhat coarse in execution.

Both Sir E. Burne-Jones's compositions, which are hung in their usual places, will disappoint some of his admirers; not for the themes, which are noble enough, but their conception and execution. His picture of "Lucifer" of last year had perhaps in it more that was forceful and impressive. The beautiful figure of "Aurora" is a poetical personification of the Dawn—"Day's harbinger comes dancing from the East"—a line from Milton has been embodied in this graceful figure of a maiden clashing her cymbals, clad in draperies touched with the hues of her own dawn, who comes dancing along a wooden bridge of curved form out of a sort of Mediæval canal. There is a pre-Raphaelite quaintness in the design of the tripping maiden, whose countenance wears a rather mournful expression, which may not charm everyone. His other large picture, "The Dream of Launcelot at the Chapel of the San Greal," is another great theme conceived in the same spirit. There is a strange weirdness about the moon-lit scene, its mystical grey blue, with the little chapel of the Holy Cup, against which clings a briar thorn, the gaunt bare fig-tree, the steed of Sir Launcelot, while the angelic guardian of the shrine looks pitifully upon the sleeping knight, who is resting his head against a stone font. The glinting moonlight on the dreaming knight throws a spell of mystery over the scene, which is rather hard, and, despite its poetical and devotional earnestness, wants more coherence of parts. L. Alma Tadema, R.A., contributes a fine study of technical quality and beauty of colour in "A Family Group." The faces and hands of his wife and daughters looking at a picture on an easel are, it is needless to say, faultless. Mrs. Alma Tadema's exquisite and charming picture of a betrothed pair seated near an emblazoned casement is even a more wonderful piece of painting, full of delicacy and subtle charm in the reflected light on the faces, and the pearly hues of colour. Philip Burne-Jones sends five subjects. His portraits of Mrs. H. Beerbohm Tree (70) and Percy, son of George Wyndham, M.P., are more satisfactory than his allegorical picture, "The Game of Life and Death," an incident taken from Coleridge's "Ancient Mariner," the apparition of which is a trifle comical and lacking in invention. His portrait of the popular actress, however, does scant justice to her vivacity and person-

ality. Two small charming and delicately-drawn figure studies by Miss Mary L. Gow, "The Sampler" (85) and "An Interlude" (89), deserve notice for their simplicity and grace of drawing and colour. A poetical idea worked out with some skill is Walter Crane's large decorative picture, "The Rainbow and the Wave" (97), in which the waves and iridescent hues of the rainbow are handled with skill.

Mrs. Swynnerton's "Hebe" is the rosy-faced cup-bearer of the gods, a healthful study of colour. A large landscape by Alfred Parsons, "On Cotswold," is amongst the best; the warm glow of sunset on the moor is admirably painted. C. Napier Hemy paints two charming seascapes; one is "The Squall." Edward Stott's "The Golden Moon" (135) is a bare landscape, with figures of girls after bathing, but redeemed by the rising moon. Briton Riviere, R.A., "An Old-World Wanderer," we have seen before; the flock of seabirds ensconced on a rock in a sheltered bay, whose retreat is disturbed by a solitary wanderer whose galley is moored yonder, is a fine piece of painting. Miss Flora Reid's "The Evening of Life" (159) is fresh in colour and admirable in sentiment, and we must also praise Edward W. Waite's "Spring," and William Wontner's idealised face, "Iris," a sweet countenance, suggestive of the colour of the flower. J. T. Nettleship is at home in his two large lion studies, which are full of life and movement—"A Mountain Robber" and "Touch and Go." C. E. Hallé has two gracefully-painted subjects, No. 125 and "Mother and Child" (153).

In the North Room are a few pictures worth notice. Adrian Stokes's large hilly landscape, "Behind the Dunes" is needlessly large. Another large canvas, "A Haunt of Ancient Peace" (198), by Alfred East, in misty blue-green tones, is poetically conceived, and Douglas Adams's "Castle Rock, Lynton" (177) will be admired for its careful painting of rock and atmosphere. Ernest Parton has a hazy landscape, "The Hush of Evening," and Val Davis, "Green in Winter." But the most notable contribution in landscape is Moffat P. Lindner's "Autumn" (212), in which the painter has introduced a kind of prismatic touch to the edges of the trees, which are reflected in calm water illumined by a fine evening sky. The effect is very realistic when seen at a proper distance, but it is rather an affectation. "A Bit of Old England" lacks colour, but is a vigorous piece of handling, by Thorne Waite. W. Padgett's "Evening Red," in the first room, may be mentioned here as a well-conceived landscape, suffused with the red light of a sunset, the gradation of colour—from rose to blue—being charmingly reflected in the sea.

The circular picture in the end of room, "Youth and the Sea Maiden" (218), is more bold than graceful in conception. Mr. Geo. Wetherbee paints the figure standing on the rock well, but its relation with the mermaid looks far-fetched. Hubert A. Olivier sends an ambiguous subject, "The Garden of Dances," on a large scale not without invention. It is an allegory, in which fame, luxury, folly, joy, love, sorrow, and death take part in a riotous dance, amongst flowers and trees. One strong note of colour is the scarlet cloak of one of the dancers, and its contrast to the sable garments of Death. Two fine portraits hang beside this work—one a graceful, full-length of Countess Clara Aldmigen, in a white satin robe, by John S. Sargent, A.R.A., one of the best studies of momentary impression. On the other side W. Llewellyn paints a full-length portrait of Mrs. Cosmo Bevan, in white satin drapery. We must also notice C. E. Perugini's "Leda," H. H. La Thangue's "Gathering Watercress" (234)—the last very strong in colour and vigorous in handling—John Finnie's "Rain Cloud" (239), the Hon. John Collier's "4 a.m."

(235), a clever *genre* picture of young ladies, one relating to her sister in bed her experiences at a ball, opposite a comfortable bedroom fire. In the balcony are several clever water-colours by Lance Calkin (274), E. Salomons, two admirable sketches of "Bruges," Albert Kinsley (293), Frederick Cullan (321), Henry M. Rheam (335), Miss Bessie Spiers (380), E. A. Rowe, and a few others.

#### THE SALON OF THE CHAMP DE MARS.

THE Société Nationale des Beaux-Arts opened on Saturday, the 25th inst., its annual *salon* at the Champ de Mars, and, according to its custom, just a week before the opening of the rival *salon* of the Champs Elysées. From a view made on the varnishing day, and from amidst the large crowd of visitors of the following day, it is scarcely possible to give here more than a brief review of the most important and striking of the works exhibited amongst the 1,300 paintings covering the walls of the Salon. Besides the paintings, there are 150 exhibits of sculpture, nearly 400 drawings, sketches, pastels, and water-colours, 60 series of architectural drawings, nearly 300 art objects, and over 100 engravings.

The most important and striking work of this year, and one which will give the *salon* of the Champ de Mars a date in the history of art, is that of M. Puvis de Chavannes placed in the vestibule above the grand staircase—a set of five decorative paintings destined for the library of the town of Boston. The panels are entitled, "Astronomy," "Virgil," "Eschylus," "Homer," and "History." In "Astronomy," we see the Chaldean shepherds observing the motion of the planets, the first great awakening of the mind before the immensity of space, the awe of the men standing lost in the midst of the vast night lighted up by the brilliancy of the stars moving slowly onward in measured rhythm. The touch of instinct is expressed by the figure of a woman leaning half-forward from the entrance of a hut, as if impressed by the wonderful brightness of the heavens, and the overcoming mystery and sweetness of the starry night. In the second panel, Virgil, the poet of peace and nature, is represented, leaning against a laurel-tree, lost in a long rapture of inspiration aroused by the voices of Nature, the perfume of the surrounding vegetation, the hives, the bees, the woods, and the lake. The attitude of the poet is full of nobleness, and the country surrounding him leaves a delicious sensation of calm and freshness. Dramatic poetry is personified by Eschylus and the Oceanides; the poet, seated on a rock overlooking the sea, sees in an inspired hallucination the plaintive Oceanides raising towards the enchained Prometheus the tribute of their eternal griefs—a perfect *chef d'œuvre* of poetic melancholy and artistic inspiration. Homer, covered with his mantle of the colour of the angry sea, is being crowned by the personifications of the Iliad and the Odyssey—the one his daughter of war and legend, and the other his child of work and civilisation. The panel entitled "History" is, perhaps, the most striking of the five wonderful paintings of Puvis de Chavannes. "History" is personified by a young woman recalling the past by uncovering the ruined pediment of a temple, half-hidden by vegetation, earth, and stones; life once existing, as shown in the stones sculptured by the hand of man, returns again in the plants and vegetation, which now half hide the ruins. The artist surpasses even himself in this last work; but each of the five panels is full of marvellous artistic and poetic genius. The conception of the work, the evident depth of thought, the composition and the luminous colouring, with at the same time a great simplicity of treatment, make each panel a *chef d'œuvre*, and the artist the admiration of his followers. This work is a suite to the panel by the same artist exhibited at last year's Salon, entitled "The Muses Acclaiming Genius, Messenger of Light," and destined for the staircase of the same library at Boston, Mass.

Room No. I., called the Salon Bleu, is entirely occupied by a large number of the most interesting studies and drawings of M. Puvis de Chavannes, forming a most valuable *ensemble* of research in art.

In Gallery No. II., M. Roll has a portrait of the late M. Alexander Dumas. The portrait remains in an unfinished state owing to the death of the illustrious author. The painting is, however, sufficiently advanced to be appreciated by



the rare vigour of its execution. Several other portraits by the same artist—notably, a woman asleep—are exhibited, and much admired. M. Gervex has several important pictures, a fine landscape destined for the Physic Amphitheatre of the new Sorbonne, several portraits, the most attractive of which is that of a pretty child seated in the midst of various-coloured flowers. The decorative panel of M. Rixens, intended for the Capitole of Toulouse, represents the sortie of the active force from Belfort in 1870, a picture full of talent, but containing faces somewhat lacking in expression. This gallery also contains an excellent portrait of a young Englishman, by Mr. Sargent, A.R.A., and a portrait by Sir E. Burne-Jones, which is much criticised for and against.

In Gallery No. III., the attention is first attracted to the large canvas of M. Jose Frappa. The picture represents an explosion of fire-damp in a coal-mine. The scene is a most striking one; the style of execution and coloration is characteristic of the artist. M. Frappa exhibits also several portraits, and an excellent picture of a nymph. M. Cornillac has an interesting landscape, in the style of treatment of which, however, the personality of the artist is lost in the endeavour to imitate the style of M. Puvis de Chavannes.

M. Raffaëlli has six canvasses, painted with remarkable genius. Amongst these, Notre Dame, the Saint Chapelle, and the Invalides are very striking. The pictures of this artist are full of the brightness and motion of busy life. He gives us the streets of Paris, with their hurrying crowd, and uses for a background the fine motionless pile of the cathedral or the Invalides, forming a striking contrast to the bright gaiety and colour of the moving figures in the foreground. M. Thaulow has some fine landscapes; M. Bernard a cascade, with excellent water effect, and a "Bath in the Lake of Annecy," a landscape of surprising richness and brightness, showing the powerful talent of the artist as a colourist. M. Weerts has a number of very small but interesting portraits, which attract great attention.

The most striking painting in Gallery IV. is "The Lord's Supper," by M. Dagnan Bouveret, a picture which is much discussed, but which will certainly be one of the successes of this year's Salon. Jesus Christ and his twelve Apostles are represented partaking of the Last Supper in an immense vaulted hall. The impression first given by the picture is not pleasing, but the real beauty of the conception and execution of the painting grows fast upon the appreciation. The artist has evidently wished to represent the sublime, prove the divinity of Christ, and depict the miracle, rather than the reality of the fact of the meeting of the Disciples around their Master. The hall is lighted by a supernatural brilliancy coming from the figure of Christ, but of a rather violent yellow colour with reddish reflections, forming a curious effect in juxtaposition with the somewhat heavy blue colour of the robes. The face of the Christ is remarkably beautiful, and the faces and expressions of the Disciples have evidently been carefully studied. The conception of Judas is much in contradiction to the bearded and cruel face to which we are accustomed. The artist has imagined all the Disciples to be very young men, full of strength and beauty. Two of these, which the painter has made the most interesting, are almost boys; the face of one of these is contracted with grief, evidently because he is picturing to himself the cruel passion of his Master, whilst the face of the other expresses the joy he feels in thinking of the glory and resurrection of his Lord. Despite all the criticisms which may be made, the work is one full of talent, beauty of conception, and vigour of execution, and will be one of the pictures the most talked of this year. It is said that the artist was offered a tempting sum of money on the condition that he would not exhibit the painting at the Salon, but allow it to be shown by enterprising Americans in the principal towns of the Old and New World.

The landscapes of M. Cazin have a wonderful impression of melancholy. His ruins of the old Harbour of Wimereux, with its houses abandoned in the water and half-buried in the sand, is full of silent sadness, aroused by the view of the quiet sea, the ruins, the tragic-looking house standing alone like a sentinel in the water, and the impression that this is all that remains of the mysterious drama of the battle-field where the

sea fought with, and vanquished, man and his work. M. Cazin has ten canvasses, all of somewhat the same sentiment, and showing the talent of the artist in evening, moonlight, or starlight effects. M. Blanche exhibits a very well-painted and attractive portrait of M. Fritz Thaulow and his children.

In Gallery V. the most striking picture is that of M. Jean Beraud, a scene of social revolution, the irruption of a band of anarchists into a sumptuous dining-room. One of the intruders carries a human head stuck on the top of his lance, the others carry heavy knives, and their faces give fierce evidence of their murderous intentions. The elegantly-dressed guests are rushing in terrified confusion from the room by the opposite door; but one of the young gallants, holding on one arm his fainting companion, has turned to face the ruffians, and, in a spirit of half-drunken bravado, defies them with a glass of champagne, which he holds above his head. A curious picture, well painted and much talked of; but containing, as usual in the works of this artist, a touch of eccentricity in the treatment of the subject. M. Leopold Stevens has a much-remarked portrait of Eugénie Buffet, dressed as a *chanteuse des cours*. M. G. de la Touche exhibits four large decorative paintings, brilliant in style and colour, and very happy in subject and conception.

Gallery No. IX. contains several fine portraits by M. Carolus Duran—those of Countess G. V., a charming brunette, M. Paul Deroude, and M. Legues. Despite the criticism that this artist has abandoned in a great measure the study of art in itself for the more solid advantages of professional portraiture, and the hint of intentional advertisement in his exhibits at the Salons, it must be granted that the work of M. Duran is in every case a *chef d'œuvre* of composition and execution. The same artist exhibits a study made at Venice in 1863, and a field of battle painted in 1870, and the treatment of these two works is considered by many to be greatly preferable to the present style of the artist. M. Josef Israëls has three pictures—"Expectation," a rustic house, and a "Woman at the Window"; the last is unsatisfactory, but the two former are very strong, and severe in expression. M. Humphreys Johnston is very successful with a portrait of an old lady seated on a green-coloured couch; the execution and sentiment are very fine. M. Harrison, as usual, comes to the fore with his clever colour studies. He exhibits this year a marine-scape, entitled "The Great Mirror," "Warm Weather" (a figure of a boy), and "Studies" (a moonlight landscape). Amongst the portraits are several by English painters, all characteristic of their style of sincere study, originality, and excellence of execution. The works of MM. Sargent, Cushing, G. B. Fox, Hopkinson, W. Stott, Cameron, Oppler, Glehn, and Frank Walton are much noticed and admired.

The section of sculpture of the Salon of the Champ de Mars has always been at once rich and poor—poor in the number of works exhibited, but rich as regards the talent displayed in certain few exhibits. M. Rodin is to the section of sculpture what M. Puvis de Chavannes is to that of painting. His work and marvellous talent may be summed up in one line or described in pages—there is no middle term of praise. His two pieces of sculpture of the year, "Illusion, daughter of Icarus," and a statue, are placed in the Salon Bleu amongst the work of Puvis de Chavannes, of whom M. Rodin is an ardent admirer. "Illusion" is a marble of the finest inspiration, execution, and "colour," a work showing authority, respect of Nature, and the comprehension of form modelled by light. The "morceau de résistance" is the monument by M. Injalbert, destined to be erected to the memory of Molière on the Promenade des Prés at Pezenas. The monument is wholly of white marble; the *ensemble* is most harmonious. The bust reproduces the traditional features of Molière, a fine bold profile, the jutting forehead, and the square-ended nose. The figure of a woman leaning over the pedestal, and offering a bouquet of flowers to the writer, is charmingly modelled and composed. A satyr crouches at the foot of the pedestal, and behind the monument two masks are suspended, one that of M. Coquelin, cadet, and the other that of Mlle. Ludwig, both of whom have played in the pieces of Molière at Pezenas. A Belgian sculptor, M. Jef Lambeaux, exhibits a "Lutte." The wrestlers are well modelled, the flesh is solid, and the muscles well marked and strong. M. Marquet de Vasselot exhibits a monument to

Balzac. The writer is represented as a sphinx. The idea is original, but the work is not seductive. The statue of a young girl tying up her hair, and the "Motherhood of M. Lefevre," a fine composition for a fountain by M. Baffier, and the "Divinity," by a Danish sculptor, M. Tegner, are all works well worthy of notice, as well as several clever busts by M. Damp. M. Jules Debois fills the whole of one of the rooms with some of the most remarkable of his works of a style full of power, but at the same time of delicate touch and feeling. His tragic group of "Death," founded in black bronze, is full of realism and inventive conception. On the contrary, his figure of Leda, sculptured in marble, forms a charming contrast, with its soft flesh of the woman conquered by love's voluptuousness. "Poverty," a figure sculptured in wood, is shown under the form of an old woman sparsely covered with rags, her bones almost piercing her much-wrinkled skin, a piece of the most daring realism, but impressed with so much human sentiment that horror gives place to pity. The same sculptor exhibits a large number of the most charming objects, sculptured in bronze, silver, and tin, in the form of plates, bottles, pitchers, and decorated objects of all kinds, giving proof of the taste and science of this artist, and his effort to bring forward a Renaissance movement of traditional decorative art.

Amongst the drawings, M. Paul Renouard and Mr. Abbey come first in rank with their sketches and illustrations. M. Renouard has a most surprising talent as a physiognomist, and can scarcely be equalled in fertility of production. His drawings for the *Illustration* and the *Graphic* are known to all; a large number of them, together with a multitude of sketches of life, reaching from the highest to the lowest, both human and animal, are exhibited at the Salon, and a few interesting hours may be passed in reviewing them.

The ink drawings of Mr. Abbey for the comedies of Shakespeare, done for *Harper's Magazine*, are here exhibited. The ingenious and clever compositions are much remarked and appreciated. The drawings of M. MacCarter are noticed for their intense and refined imagination.

The section of objects of art is rather poor this year. There are some original types of sculpture in wood by M. Carabin, some marvellous specimens of artistic glass-ware by M. Koeppling, a delicately-sculptured bed by M. Jean Damp, a work of high merit; several artistic decorative tiles, the work of M. Bigot, and a few exhibits of artistic furniture.

The review of the architectural drawings and designs must be left for further notes; the drawings and maquettes are not yet all in their places. It will need a little leisure to examine the exhibits of M. de Baudot, the *maître*, and those of the younger architects, MM. Benouville, Guillemonat, Bischoff, Garas, Paul Gout, and others, all of whom have exhibits well worthy of careful examination.

ARTHUR VYE PARMINTER.

#### THE ARCHITECTURAL ASSOCIATION.

THE last meeting but one for the present session of the Association was held on Friday evening, the President, Mr. W. D. Caröe, F.S.A., in the chair. Mr. Banister F. Fletcher, hon. secretary, announced that an exhibition of bricks and tiles would be opened on the following Friday (to-day) at the rooms of the Institute of Clayworks, 222, Strand, W.C., from 2 till 6 p.m. He also stated that the annual soirée of the Association would take place on Friday, May 15th, at St. Martin's-in-the-Fields Town Hall.

THE PRESENT POSITION OF ARCHITECTURE AT THE ROYAL ACADEMY.

A paper on this subject was read by Mr. FRANCIS MASEY. He pointed out that of the 39 full members of the Royal Academy, there are 31 painters, five sculptors, and but three architects, a proportional representation which he thought must be regarded as utterly inadequate. In intimate and natural relation to, perhaps as a consequence of, this undeniable inequality of representation, there was a no less remarkable inequality of distribution of space at the annual exhibitions. By means of a diagram the lecturer showed that at last year's exhibit at Burlington House, the relative space allotted to architecture compared to the sister arts, was as one to sixteen. Granting, then, that these facts revealed a condition of things which could be scarcely called satisfactory, he proposed to try to discover some of



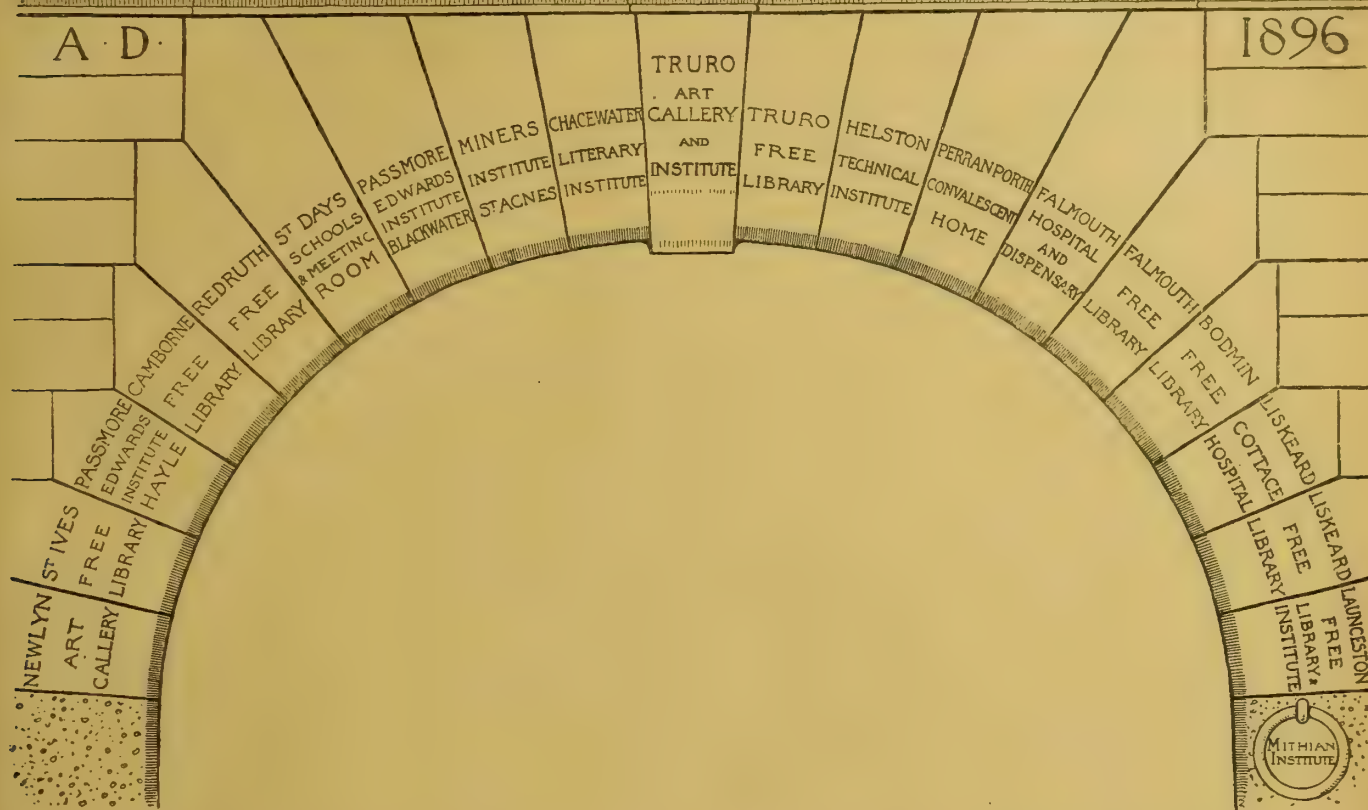
the causes of such, and also its probable effect upon contemporary architecture. The period at which the Royal Academy was founded (namely, in 1768) could not be said to have been an epoch in our national artistic history of which we might be particularly proud. In the case of architecture, with certain brilliant exceptions such as William Chambers, a very low-water mark was about to be touched. At this neglected period of its culture it was scarcely more than a handmaid to certain dilettante-art-patronising noblemen, and an expensive luxury. On the other hand, the distinguished founder of the assembly shed by the light of his genius a halo over the whole of his own profession, and the advantage thus gained on behalf of painting, aided by the lack of influential men in our own calling, and also by the apathy with which the public at that time regarded architecture, no doubt helped to account for the small number of architects' names which appeared upon the roll of original members. Good as the reasons might have been for the subordinate position taken by architecture a century since, they had long ceased to hold good in the face of the growth of knowledge and skill in all concerning it which had since taken place, and consequently could scarcely be advanced in objection to a more equitable adjustment now. Architecture had taken to itself new life, and had unquestionably produced, and was still producing, men and buildings equal to anything of which from past ages they had substantial record. During this revival of constructive life our greatest architects, not having been men of academic instincts, had been content to rely upon their buildings themselves rather than upon exhibitions to act as their source of reputation. Hence, architects as a body had allowed the almost nominal representation of their art to continue without any efforts at reform until the present time. This might be to some extent due to the feeling that their works were not to be judged of upon the walls of picture galleries any more than the knowledge necessary to perform them could be acquired beyond a certain point within the four walls of a school. Another cause which was not unlikely to have acted as a safety-valve in relieving pressure which might otherwise have been brought to bear upon the authorities had arisen in the shape of an Institute of Architects. Was, he asked, the present arrangement likely to exercise any influence upon the welfare or otherwise of the profession? It might be advanced that architecture depended for its popularity and architects for their living to a very small degree upon the roomful of drawings at the annual exhibitions; that architects appealed and had access to a far wider circle of patronage and criticism than was within the reach of painters; that those wishful to raise cathedrals or churches, halls or palaces, houses or schools, did not seek the architectural drawings room at the Royal Academy in order to choose them a master craftsman to effect their purpose; that the architect's true picture gallery was a public one, depending not upon clever lighting and gilded frames; and that, therefore, any claim by architects to any equal share in the limited space wherein the works of painters were exhibited was on the face of it unreasonable. Again, it might be urged that the annual exhibitions had come to be regarded by the educated public as exhibitions of paintings of high merit, and that the hall-mark conferred by its walls rendered every inch of available space a vital matter to those concerned, and established a moral right to a proportion of space far exceeding any to which architects could fairly lay claim. Although these arguments might be urged with considerable justice so far as the present exhibition space was concerned, they did not account for the disproportionate representation of architects on the body corporate as to representation question. The present day to a large degree was an age of hall-marks. In the case of the Academy, its membership carried a considerable weight amongst the educated public, and the influence wielded by those recognised amongst their fellows as leaders of their craft was considerable. It was, therefore, fair to assume that, were architects represented in juster proportions, an effect upon the lay mind would be produced which might result in considerable benefit in many ways. For instance, a phalanx of experienced architects, strengthened with an authority and influence such as the Royal Academy could alone confer, might do much to direct public taste when questions arose affecting the preservation of our national monuments or the improvement of our

cities. Scarcely a day passed that we did not see fresh symptoms of the injury which might be done to the most beautiful parts of the town by buildings whose repulsive design proclaimed them as the work of the sham architect — buildings which threatened to destroy much that was lovely and interesting in our city. Nothing but legal power would prevent abuses of this kind being perpetrated. But how could the Royal Academy expect to command the necessary weight and respect when public matters architectural were in question, whilst their own appreciation of the greatest of all the arts was shown by a representation of three to thirty? Then with regard to exhibition space, the majority of those who patronised the Royal Academy galleries could but be affected in some degree by observing the subordinate position which architecture and all pertaining thereto occupied. The newspaper criticisms generally offered a fair reflection of the popular taste, and here architectural matters were either treated with grotesque ignorance or were passed over in silence. A still more far-reaching effect might be noticed in the tendency shown by the decorative arts during some years past to develop in directions entirely independent of those great central principles, the disregard of which was an invariable path to degeneration. For instance, decorative adjuncts as hangings and furniture, although advancing towards a higher standard of excellence day by day, often showed, except in the very best work, a marked want of that simplicity and dignity which were desirable to produce an harmonious effect. Finally, there are signs on many sides of the awakening of an intelligent interest in architecture, too steady and progressive to be treated as a passing fashion. In endeavouring to emphasise the inequality of footing upon which architecture apparently stood at the Academy, the author did not intend to ascribe any intentional want of appreciation on the part of the representatives of painting and sculpture. After all had been said, the plain fact remained that the Academy, by its traditions and constitution, was generally regarded as a painters' body. Founded by our greatest painter under circumstances already referred to, architecture was doubtless sufficiently represented by the handful of men who figure in the original thirty-six. Starting thus at the Cinderella of the community, it was not altogether surprising that, lacking pressure from without, no considerable reform in the position of architecture had taken place. He would not deal with an objection likely to be advanced against any claim by architects to more space — namely, that paintings and sculpture were the actual works of art exhibited, whereas the architects' drawings were merely memoranda of achievements elsewhere. Granting that the small number of miscellaneous drawings exhibited were not in themselves necessarily works of art, it was surely the very want of adequate space for a satisfactory show which has brought about the present result. Or, putting architectural drawings aside, where were the representatives of the other "Arts of Design" which the Academy lived to encourage? He meant the painted glass, wall-hangings, wood-work, metal-work, and other less-favoured but equally deserving children of the goddess of Art! So long as the public were annually shown what to the living reality is but a cave of dry bones, which they were taught by inference to believe represented the wonderful art of architecture, they were little likely to desire or even relish an enlargement of its borders. It seemed ludicrously perverse that architects' drawings, which were, or should be, scientific diagrams, embodying instructions from the master for the guidance of the artisan, should have come to be regarded as representative of facts to which they in reality only acted as the signposts. Was it then to be wondered at that, under the present circumstances, visitors paid their shillings to visit virtually only those rooms where the paintings were exhibited, and where they could see what, comparatively speaking, entertained them, and repair to the architectural room but for timely slumber or surreptitious refreshment? This difficulty of space to some extent "touched the spot," for to make an architectural exhibition satisfactory, ample room was a *sine qua non*. As an example, take Mr. W. B. Richmond's cartoons for the recently completed work in St. Paul's Cathedral. These were fine works of art, which, for want of a suitable gallery, architects and other artists might possibly never have the profit of be-

holding. Again, what opportunity had one of seeing the drawings for stained glass made by Burne-Jones or other masters, which were constantly going to enrich provincial towns, and the educating value of which, to those concerned in glass-painting, could scarcely be over-estimated? The same would apply to Mr. Walter Crane's charming wall-paper studies or Mr. W. Morris's exquisite fabrics. For the showing of these and a host of other beautiful things space was essential. My proposal is (continued Mr. Masey) that the Royal Academy should organise an architectural exhibition on a more liberal basis than has perhaps been possible in the past. The annual winter exhibitions of Old Masters must have of late become somewhat difficult, owing to the supply of unexhibited works having naturally become exhausted. I would, therefore, suggest that, for the present, during alternate years, architectural exhibitions should take their place. I do not think that this is an extravagant or impracticable suggestion. The first undertaking of the sort would naturally be in the nature of an experiment; but it is my firm conviction that it might become in time almost as popular as that which it would supersede. Such an exhibition might naturally fall under the immediate auspices of the distinguished architect-members of the Academy; it would, of course, require careful discrimination and skilful organising; but given these, there is some reason to hope that it would be found to interest a sufficiently large section of the community to justify its inauguration. One of the many results would probably be an appreciable impetus to the progress of the applied arts, owing to the accession of dignity and status that such a recognition on the part of the Royal Academy would confer, whilst the largeness of the field from which the objects exhibited could be selected would render it no difficult matter to fill the galleries whilst preserving a very high standard of excellence. The exhibition might include drawing, models, and photographs of buildings, including the best of the students' work of the year, architectural sculpture and modelling, wall and ceiling decorative painting, cartoons for frescoes, tapestry and painted glass, metal-work in its numerous applications, wood-carving, mosaics and inlays, hangings, furniture, and gold and silversmiths' work. A useful series of lectures might be held during the exhibition for the benefit of craftsmen, and given by the recognised masters of decorative and applied art. Other features, such as free evenings for working men and women, it might become possible to arrange, with every chance of their appreciation and success. With the regular holding of exhibitions such as the foregoing, stony ignorance of architecture and want of appreciation shown to its professors would give place to an intelligent interest in artistic pursuits; that the labours of missionary societies, like the Art Workers' Guild and the Home Arts and Industries' Association and others, would receive a sensible impetus, and would recognise in such exhibitions a development and new manifestation on a somewhat extended scale, of a popular interest in the fine arts. I believe that such an enterprise is actually possible, that there are sufficient indications of support to justify it, and that the benefits conferred upon art would be not inconsiderable. As regards this proposed exhibition, there is a criticism which will naturally occur to many, and it is that the Institute of Architects would not receive in such a scheme that recognition of its authority and standing to which its position would entitle it, and this objection brings me to an alternative proposal, and to the final part of my subject. My other proposition is crudely and shortly that architects should withdraw from the present unequal partnership at Burlington House, and establish themselves under an independent corporate authority or academy upon the basis, say, of the present Royal Institute of British Architects. I do not think that this is as wild or revolutionary a suggestion as it may at the moment appear. It is certainly no more essential that an academy or institute of architecture should be linked to one of painting than medicine to surgery, or poetry to music. There might surely be expected such a support accorded to architecture now as was enjoyed by painting at the birth of the Royal Academy 130 years since. The beginnings of that now influential body were doubtless comparatively modest. Why should not the present Royal Institute of British Architects, with enlarged powers, extended support, and under distinguished patronage, commemorate



# PASSMORE EDWARDS' INSTITUTIONS IN CORNWALL



the advance of architecture and decoration by starting an extended career of usefulness, commencing with the new century as the Royal Institute of Architecture? With new premises to keep pace with its growth of dignity, with a moral and financial support which it certainly might reasonably expect, the new Institute might wield an influence towards the advancing of the status of architecture which at present, owing to divided centres of authority, has not been possible. With a Government grant, by means of donations and subscriptions from a wealthy and interested laity, from members' subscriptions, and by means of the annual exhibitions, a sound financial foundation might be formed.

A short discussion followed, in the course of which Mr. PAUL WATERHOUSE, who proposed a vote of thanks to the lecturer, said the position of architecture at the Academy was doubtless anomalous; but he did not think any good could be gained by the entire withdrawal of architects from membership or from the exhibitions. The British public was the ultimate court of appeal, as Mr. Masey had suggested, and there was the practical difficulty that neither painters, nor the public cared for architecture. Neither did the public, with few exceptions, understand or take an interest in the technique of painting; all they desired was to see pictures, and they were willing to pay their shillings to look at pictures of the Adelphi melodrama type. Further, a good many people dabbled a little in water colours and pencil sketches, and therefore took an interest in the work; but no one was similarly interested in architecture.

Mr. A. BERESFORD PITE, in seconding the vote of thanks, said Mr. Masey had discussed a purely academic subject in a purely academic manner, and the only outcome could be a purely academic one. He doubted whether the Architectural Association was a sufficiently stable fulcrum from which to move the Academy, however powerful Mr. Masey's paper might be as a lever. He had hoped that the lecturer would deal with the more practical question of the Academy schools, and the way in which they might be improved. As an old R.A. student he could speak of the great benefits which these schools conferred on those who worked there. They were not only absolutely free for the six years'

course, but were visited by Academician architects, and offered valuable prizes for competitions, while the young architects could not fail to benefit from meeting with students in painting and sculpture, and in hearing lectures on those subjects as well as architecture. The best reason why the architectural room at the Academy was deserted was because it was an uninteresting show. They must be sensible in this matter. The fact that they were recognised by the Academy, and given a room in which to exhibit, was something. Architectural draughtsmanship, such as was popularised by Samuel Prout and David Roberts, was not architecture; but it was draughtsmanship and not architecture that was represented at the Academy.

Mr. A. W. EARLE, Mr. SYDNEY BEALE, and the President having supported the vote of thanks, it was carried by acclamation.

## THE PASSMORE EDWARDS INSTITUTIONS IN CORNWALL.

**B**EGINNING with the lowest voussoir on the left-hand side of the arch, we have the Art Gallery at Newlyn, near Penzance, opened by the Right Hon. Leonard Courtney, M.P., in October last. It was built from designs by the late Mr. James Hicks, M.S.A., of Redruth, Messrs. John Symonds and Son, of Blackwater, near Scorrier, being the contractors, and was illustrated in the *Building News* for Feb. 8, 1895. The free library at St. Ives appears in our photo-lithographic pages this week; the architects and builders are Messrs. John Symonds and Son. The Passmore Edwards Institute at Hayle, opened by the donor on Wednesday of this week, was designed by Mr. Silvanus Trevel, F.R.I.B.A., M.S.A., of Truro, and was fully shown by plans, sections, and elevation in our issue of Sept. 22, 1893; it is another of the structures built by Messrs. John Symonds and Son. The Free Library at Camborne was opened on Thursday in last week by Mr. Passmore Edwards, who had also laid the foundation-stone. In this building, given in our pages on April 13, 1894, and May 24, 1895, Mr. Silvanus Trevel and Messrs. John Symonds and Son were again associated as architect and builders. The Free Library

in Clinton-road, Redruth, also opened by the donor on Thursday se'nnight, was designed by the late Mr. James Hicks, and built by Messrs. John Symonds and Son. Plans and a perspective of the building were published in this journal on August 3, 1894. The schools and meeting-room at St. Day were built by Messrs. John Symonds and Son. The Passmore Edwards Institute and Free Library at Blackwater was opened on August 14, 1890; it was built by Messrs. John Symonds and Son, the head of the firm acting as architect. The Miners' and Mechanics' Institute at St. Agnes forms a memorial to the late Mr. William Passmore Edwards, who died in London; it is built of local stone with granite dressings, and comprises a reading-room and billiard-room, each 24ft. by 18ft., committee-room, 16ft. by 14ft., and other apartments. The Literary Institute at Chacewater was erected in 1893-4 as a memorial to Mr. James Edwards, brother of the donor, who died in Australia; Messrs. John Symonds and Son were the builders. The Art Gallery and Institute which forms the keystone of the arch is about to be built at Truro. The Free Library in the same city, of which the foundation-stone was laid by Mr. Edwards yesterday (Thursday), will be erected by Messrs. Clemens and Battershill, of that city, from designs by Mr. Silvanus Trevel, the ex-mayor, and was illustrated in the *Building News* of May 17, 1895. It occupies a corner site having an area of 53ft. by 45ft., and is two floors in height, besides attics; it will form a memorial to the late Mr. Henry Sewell Stokes, Clerk of the Peace for Cornwall, in whose office Mr. Edwards spent his earlier years. The Technical Institute at Helston is to be built by Mr. Edwards, at the request of the townspeople, in place of the free library originally offered. The Convalescent Home facing the bay at Perranporth was shown in our issue of September 2, 1892; Messrs. John Symonds and Son designed and built the institution. The Hospital and Dispensary at Falmouth, opened by Mrs. J. Passmore Edwards on April 13, 1894, was illustrated in our pages the same day; it has been erected by Mr. Trehane, of Falmouth, from plans by Mr. H. C. Rogers, of Carteret-street, Westminster; the panels under the bay windows on the chief front were modelled by Mr. George Frampton, A.R.A. The Free Library



and Art Schools at Falmouth, to be opened by Mr. Passmore Edwards to-day (Friday), were also shown by plans and elevation in our last issue of April 13, 1894; they have been built from designs by Mr. W. H. Tressider, the borough surveyor of Falmouth, acting in collaboration with Mr. F. J. Bellamy, architect, and stand in the Market-square. The Free Library at Bodmin, illustrated in our current issue, is being built by Mr. Sampson Treharne, of Liskeard, from plans by Mr. Sylvanus Trevail; the foundation stone was laid by Mr. Edwards on Monday. The Cottage Hospital at Liskeard, opened by the donor on Tuesday, has been built from designs by the late Mr. James Hicks, and was illustrated by us on March 29, 1895. On the same day, Tuesday, Mr. Edwards laid the memorial stone of the Free Library at Liskeard, now in course of erection by Messrs. John Symonds and Son, and fully shown in our photo-lithographic pages to-day. The Free Library and Institute at Launceston, is another of the buildings given by the same donor, as is also the Institute at Mithian, opened by Mr. Edwards on April 12, 1894.

#### ST. MARK'S HOSPITAL FOR FISTULA.

THIS institution was founded in 1835, and the present building, situated in the City-road, which was erected in 1852, has long been found insufficient to meet the needs of the institution. The committee therefore acquired a plot of land in the rear of the hospital, and obtained the services of Mr. Rowland Plumbé, F.R.I.B.A., 13, Fitzroy-square, W., as architect.

The new hospital building is approached from the City-road across a paved forecourt, and contains upon the ground floor the committee rooms and secretary's office, matron's and surgeon's quarters, male day-room and nurses' day-room, all provided in the old building. The whole of the new block is devoted to the out-patients' department, and includes waiting-room, surgeons', and examining rooms, dispensary and drug store, with all sanitary accommodation, the whole approached by a separate entrance from the City-road, and with a separate exit. Disconnected from the main building is a mortuary, also as a post-mortem room. A hydraulic bed-lift connects the ground floor and basement with each upper floor, and the stone staircase of the old building is maintained for passenger traffic.

The first floor is devoted to men's wards; two for five beds, and two for three beds are provided in the old building, and in the new block a lofty ward for twelve beds, with bath-room, ward scullery, sink-room, and the numerous sanitary fittings required for the treatment of these special diseases. The second floor contains a twelve-bed ward for women, with bath-room, scullery, and sanitary arrangements all as to the first floor ward, whilst the old portion of the building is fitted up with separate rooms for eleven nurses, and the bed and bath-room for the matron and accommodation for the servants.

The new block rises to the third floor, is approached by a wide and easy staircase, and contains a light and spacious operation theatre, four single wards for paying patients with ward scullery and sink-room and sanitary accommodation. The boiler-house, disinfectant room, coal-cellars, servants' hall, kitchen, and offices connected therewith, and porter's bedroom, are all provided for in the basement, and special hydraulic lifts are provided for conveying the coal and food to the various floors.

The whole of the new buildings are carried out with fireproof floors of steel and concrete. The interior is finished with a glazed brick dado, 5ft. high, with tinted polished Parian cement over, and Portland cement to sink-rooms and w.c.'s, the whole with hollow internal angles. The floors to wards and rooms are of polished Johore teak, and to the corridors and operating theatre of Terrazzo marble mosaic. The exterior is faced in the areas with white glazed bricks, and elsewhere with picked stocks, and moulded cornices and groins of Brown's red brick.

The old buildings have been converted and remodelled and brought more into harmony with modern ideas of hospital requirements. The new works have been executed by Messrs. Treasure and Sons, and the alterations to the old building by Messrs. Harris and Wardrop, of Limehouse. The system of artificial heating adopted has been carried out by Mr. John Grundy. The heating apparatus is fixed in the basement in a specially constructed chamber. The cold outer

air is taken from the garden at back at an elevation, and before entering the chamber is passed through a filtering shaft, where it is washed and all impurities deposited.

#### RIVERS POLLUTION AND CONSERVANCY.

AN interesting paper on the above subject was read on Monday evening last at the ordinary general meeting of the Surveyors' Institution, by Mr. R. F. Grantham (Associate). The author began by stating that the Acts of Parliament at present in force for the prevention of floods and for the restriction of pollution were altogether inadequate. Several Acts had been passed affecting large districts, but no general Act dealing with the entire river system of the country had been introduced. The Rivers Pollution Prevention Act of 1876 had been embodied in several Bills, which proposed to confer a power on riparian owners of applying to the Local Government Board for an order to establish local conservancy boards. The Bill of 1879 proposed to divide catchment areas into highlands, midlands, and lowlands, and to tax these lands for river conservancy purposes in an inverse ratio to their level above the river. The Act of 1871 conferred powers for drainage purposes over a large part of the Thames Basin above Long Whittenham, an area amounting to some 830,000 acres. The area flooded in November, 1875, and in 1894 in this district was about 71,000 acres. The district was divided by the Act into seven areas, the limits being fixed by ascertaining the contour line 5ft. above the highest recorded floods in the river and its tributaries. The rateable area thus determined was some 55,000 acres, or one-fifteenth of the whole watershed. Under this Act there had been carried out extensive works in dredging, rebuilding locks and weirs, and other operations which had resulted in carrying off the flood-water more rapidly and improving the drainage. The Somersetshire Drainage Act of 1877 was modelled on some the same lines. It applied to an area of some 600,000 acres, the flooded area in 1873 being about 69,000 acres, and the rateable area about one-fifth of the watershed. In 1880, the River Witham (Lincolnshire) Outfall Act was passed. The area of land drained was some 762,000 acres, about one-fourth of which contributed towards maintaining and improving the outfall. These lands have been charged for 35 years with a tax not exceeding 1s. per acre in any one year. The new outfall had very greatly benefited the drainage of the districts dependent on it. Thus, in these three districts some two million acres had been improved, the cost being provided by rates on from one-fifteenth to one-fourth of the entire basin. In the case of the River Ouse below Bedford, the watershed area is nearly two million acres, and the area subject to floods nearly 282,000 acres. The late Mr. Abernethy in his report, recommended that the whole watershed area should be taxed to pay for the maintenance of the river, which, in fact, constituted its main drain. The author also quoted the case of the Nene, with a drainage area of nearly 700,000 acres, and an area subject to floods of not quite one-half, and further, dealt with the composition and powers of the Conservancy Boards of the Thames and Lea, the latter being the first River Conservancy Board established in England. Both of these derived some income from the water companies which paid for the water taken from the stream, and for the protection of their rights. The Thames Conservancy, under the Act of 1894, derives an income of £19,655 from the water companies, besides tolls for navigation, &c. But still, the improvements carried out seemed to be inadequate in the case of floods, such as that of 1894. The author quoted, at length, many instances in which improvements had been made in the conservancy of rivers, and measures had been adopted for preventing their pollution, and while he saw the advisability of making the catchment basin the area of taxation in respect of any one river, recognised the opposition which was likely to arise from the occupiers of the higher lands which, while they were drained by a river, did not appreciate the benefit which the prevention of its flooding would confer on their neighbours on lower ground.

A discussion ensued, in which Professor Robinson, General Flower, Mr. Newmarch, Professor Symons, Mr. Moreton Frewen, Dr. Frupp, Mr. Vernon Harcourt, Colonel Jones, V.C., and Mr. Assiter took part.

Several speakers referred to a system intro-

duced by Professor Woolf in America, and adopted experimentally at Maidenhead, Berks, by which a certain proportion of sea water, or salt and water, was treated electrolytically, the result being the liberation of a large amount of chlorine gas, and mixed with the sewage effluent, rendering it, according to one speaker, even purer than ordinary drinking water. Dr. Frupp, who had been carefully watching the Maidenhead experiments, acknowledged that their duration had been too short to enable him to form a decisive opinion as to their value, but said that from what he had seen and from the reports of eminent bacteriologists, the treatment appeared to result in the practically complete sterilisation of the effluent.

#### CHIPS.

The new fire-engine stations in Kingsland-road and in Tabernacle-square, Shoreditch, erected for the London County Council, were formally opened yesterday (Thursday) afternoon.

At the last meeting of the City Corporation, the scheme for erecting a new Central Criminal Court and prison on the Embankment site was abandoned, and the City Lands Committee were desired to bring up plans and estimates for rebuilding the Sessions House on its present site. The estimated cost of the Embankment scheme was £180,000, in addition to the value of the land, an area of 45,795sq.ft., taken at £159,530.

New premises have just been completed for the Capital and Counties Bank in Clare-street and Baldwin-street, Bristol. Mr. H. Milverton Drake was the architect, and Mr. C. A. Hayes, also of Bristol, the contractor.

Plans for large blocks of artisans' dwellings, to be built on the site of the old Penitentiary, Diana-street, Newcastle, for the Rutherford Dwellings Company, Ltd., have been passed by the town improvement committee of the Newcastle corporation. The architect is Mr. Thomas Mackay, of Newcastle-on-Tyne.

The town council of Aberdeen, after a long discussion, decided, at their last meeting, by 20 votes to 9, to adopt plans by the burgh surveyor for the erection of police workshops and a fire-brigade station in King-street at a total cost of £16,000.

The death is announced of Mr. Thomas Meik, M.I.C.E., at Edinburgh, at the advanced age of 85. The deceased was a harbour engineer of repute, and served the River Wear Commission in that capacity from 1845 to 1868. He subsequently retired, and became consulting engineer. Finally settling in Edinburgh with his sons, who followed their father's profession, he undertook many important works, including the fishing harbours of North Sunderland and Eyemouth on the N.E. coast.

Mr. James E. Crackston, sole partner of the firm of John Crackston and Son, builders, Dumfries, died on Friday, aged forty-eight years. The firm carried out many important contracts in various parts of the country, among them being the erection of the two prisons at Barlinnie for Glasgow district, and the Gartloch Asylum, near Glasgow, which is still in course of completion. The prison at Dumfries was also built by them, and many large mansions and public works in the district.

At the last meeting of the Scarborough Board of Guardians, the report of the sub-committee appointed to consider the plans for the enlargement of the workhouse infirmary and the laundry at a cost of £7,207 was adopted, and the sub-committee was instructed to consider the question of erecting a new board-room and a receiving ward for vagrants. The estimate for the latter was £1,260, exclusive of furnishing.

The question of the application of the Edinburgh building regulations to Crown property in Edinburgh, which the Treasury raised on the Edinburgh Improvement Bill, and which was also conversely raised on the Register House Bill, was settled on Monday. The Treasury agreed to withdraw their objections to the Improvements Bill and the Corporation have, on the other hand, withdrawn their petition against the Registrar House Bill. The question, therefore, will remain unchanged from the existing law under the Edinburgh Acts.

In connection with the recent donation of half a million dollars by Mr. W. C. McDonald to McGill University, Montreal, provision is made for the establishment of a chair and course of instruction in architecture. There is some probability that arrangements can be made for the inauguration of this course at the next session, the necessary accommodation being provided in one of the existing buildings of the university.

The council of the Society of Antiquaries of Scotland have nominated Mr. J. Balfour Paul, Lyon King of Arms, as Rhind Lecturer in Archaeology for 1898, on "Heraldry in Relation to Scottish History and Art."



## CONTENTS.

May Morning ... ..	625
Pictures at the Royal Academy ... ..	625
Architecture at the Royal Academy.—I. ... ..	626
The New Gallery ... ..	627
The Salon of the Champ de Mars ... ..	628
The Architectural Association ... ..	629
The Passmore Edwards Institutions in Cornwall ... ..	631
St. Mark's Hospital for Fistula ... ..	632
Rivers Pollution and Conservancy ... ..	632
The Building News Directory ... ..	XIII.
Our Illustrations ... ..	633
Building Intelligence ... ..	652
Competitions ... ..	653
Architectural and Archaeological Societies ... ..	653
Correspondence ... ..	653
Intercommunication ... ..	654
Legal ... ..	654
Legal Intelligence ... ..	655
Water Supply and Sanitary Matters ... ..	656
Stained Glass ... ..	656
Our Office Table ... ..	656
Meetings for the Ensuing Week ... ..	657
Trade News ... ..	658
Tenders ... ..	659

## ILLUSTRATIONS.

THE PASSMORE EDWARDS FREE LIBRARIES AT BODMIN AND ST. IVES.—SELECTED DESIGN FOR NEW ROYAL INSURANCE COMPANY'S OFFICE, LIVERPOOL.—COMPETITIVE DESIGN FOR THE SAME.—PROPOSED CHURCH ON THE CLIFF, SCARBOROUGH.—SILESIAN TOMBS.—METHODIST FREE CHURCH, NOTTINGHAM.

## Our Illustrations.

THE PASSMORE EDWARDS FREE LIBRARY, BODMIN.

THIS building is to be erected through the munificence of Mr. J. Passmore Edwards, on a site in Fore-street, Bodmin, acquired from Lord Robartes, at the junction of the road leading to the Beacon, where stands the prominent obelisk to the memory of the late General Gilbert, of the same town. It will be a great improvement to this part of the ancient borough, and is centrally situated for the population. The plan exhibits the arrangement of the ground floor, and the upper story is to be devoted to a local museum and an excellent suite of classrooms for the use of classes in technical instruction in connection with the County Council scheme of technical education. The walling will be in Margate Wood stone, with Bath stone dressings. The internal joinery will be in pitch-pine, varnished. The roofing will be of the Cornish grey slates, quarried at Delabole, and the base and steps of Luxulyan granite. The foundation-stone was laid by Mr. Edwards last Monday, and contains the following inscription:—"This stone was laid by J. Passmore Edwards, Esq., 27th April, 1896." The Mayor, Corporation, High Sheriff of the County of Cornwall (Sir Robert P. Edgecumbe), the Mayors of Falmouth, Liskeard, and Lostwithiel, and other notabilities were present. The architect is Mr. Silvanus Trevail, F.R.I.B.A., of Truro, and 13, Sherborne-lane, E.C., and the builder is Mr. Sampson Trehane, of Liskeard.

PASSMORE EDWARDS FREE LIBRARY, ST. IVES.

THIS building is the gift of Mr. J. Passmore Edwards to the inhabitants of St. Ives, an ancient borough in his native county, and is another proof of his unbounded generosity. After accepting Mr. Edwards's offer, the corporation, in the first place, had great difficulty in procuring a suitable site for the building; but, however, they at last succeeded. The present site, the gift of Mr. T.B. Bolitho, M.P. for the Western Division of Cornwall, is but a short distance from the railway station, and, on entering the town, is situated very prominently on an angle where two streets intersect. The frontage of the building towards Gabriel-street is 76ft. in length, and that against the main street 34ft. The perspective sketch is taken from the main street. The elevations are to have granite dressings to the plinth line; above this the dressings will be of Bath stone, with pink rockwork Elvan facings; all other walls will be of local stone, with brick dressings. Internally, the ground floor will contain newspaper and periodical room, 30ft. by 18ft.; lending library and borrowers' lobby, 32ft. by 18ft.; boys' reading-room, 19ft. by 10ft., with spacious lobby and staircase, also heating chamber and other offices. The partitions on this floor are to be glazed for

librarian's supervision. On the first floor there will be a reference library, 28ft. by 18ft.; ladies' or committee-room, 15ft. by 15ft.; librarian's room, 19ft. by 10ft., also necessary caretakers' apartments. The whole of the building for library purposes will be heated with hot water on the most modern approved principle, and will be well lighted and ventilated throughout. Messrs. John Symons and Son, of Blackwater, Scorrier, are the contractors for the building.

THE ROYAL INSURANCE COMPANY'S NEW OFFICES, LIVERPOOL.

THIS illustration, reproduced from the architect's competition drawing, which is now on view in the Royal Academy Exhibition, represents the chosen design by Mr. J. Francis Doyle, the architect, who has been instructed to proceed with the buildings. The site is one of the most important in Liverpool, at the corner of Dale-street and North John-street, and bounded on the south and east by Princes-street. The frontage is 53ft. in Dale-street, and 213ft. in North John-street. It is intended to have a sub-basement and also basement floor below the ground level. The façade is shown by the perspective, and it is not too much to say, amply justifies the selection made by Mr. R. Norman Shaw, R.A., the professional referee. The building will make an exceedingly handsome and admirable addition to the architecture of the city. The base of the building, up to the first-floor window-sills and balconies, will be of light grey Aberdeen granite, and the wall-facing above a white stone. The interior of the basement will be lined with white glazed bricks. The main entrance, the whole of the ground floor, staircase, and first floor is to be elaborately fitted up. The board-room occupies the front position on the first floor overlooking Dale-street. The apartment measures 47ft. by 28ft., and is to be 23ft. high, and will be a room on which much richness and beauty of detail will be lavished. A great feature will be made of the main staircase, which is to be of a novel character, and from its scale and proportions will add to the importance of the hall. It is intended to make the sanitary and toilet appointments of the most advanced and perfect kind. The elevators will be worked by electricity. At the top of the building a large dining-hall will be arranged, providing cooking accommodation, with separate dining-rooms and toilet-rooms for females. Importance is given to the ground story by its being 22ft. high from floor to floor, and by a special system of top-lighting from the side-street. The Company's present buildings are of considerable architectural importance, but the directors have acquired all the property of the enlarged site and some of the surrounding buildings. It was originally intended to extend their existing premises over the enlarged site; but after giving the matter the fullest consideration, the Company decided upon an entirely new building.

ROYAL INSURANCE BUILDINGS COMPETITION, LIVERPOOL.

THE drawings of this design, by Mr. J. Belcher, were lent us last March; but pressure on our space prevented their earlier illustration, and we take the opportunity of showing the exterior of this scheme at the time of illustrating Mr. J. Francis Doyle's chosen design, so that the contrast furnished by two such divergent treatments may be compared. We understand that in Mr. Belcher's design an imposing office as the headquarters of the "Royal" was the ideal aimed at, rather than permitting any considerations of a financial kind (such as accommodation for offices to rent out) to restrict the scope of the architectural composition, it being thought by its author to be better rather to allow the importance of the façade to impress the public, and so direct attention to the purpose of the building. We shall illustrate the interior at an early date.

PROPOSED CHURCH ON THE CLIFF, SCARBOROUGH.

IT is proposed to build this church of Whitby stone, the roof to be covered with red Broseley tiles. The chancel will be fitted with carved and painted oak stalls, with black and white marble floor, moulded plaster painted ceiling, and wrought-iron and oak chancel-screen, with Pavenazza marble base. The nave roof is to be groined in stone, and the floors of aisles to be laid with a dull sage-green tile. The walls and ceiling of aisles will be panelled in oak. The seating in nave and aisle to be low oak pews, stained a greenish tint, with richly-carved ends. Messrs. Hall, Cooper, and Davis, of Scarborough, are the architects.

SILESIAN TOMBS.

HIRSCHBERG, a town of some 10,000 inhabitants, is situated in that district of East Germany known as Silesia. It lies in a beautiful position at the foot of a mountain, and is the centre of the linen industry, the manufacture of which in the middle of last century was in a far more flourishing condition than it is at the present time. Remains of its former importance still exist, not only in its double line of walls and the rich interiors of its private houses, but also in the magnificence of its tombs. Four of these tombs we illustrate on another page to-day, and they sufficiently show the love of display which possessed the merchant princes of this township at the beginning of the 18th century. They are mostly built in stone; but some are of brick covered with stucco—a few are in marble. They nearly all are alike rich in sculpture (oftimes in the most Rococo taste), and in the elaborateness of the wrought-iron grilles which adorn the portals of these sepulchral edifices.

METHODIST FREE CHURCH AND SCHOOL, NOTTINGHAM.

THIS church and school is now being built on a site at the corner of Gregory Boulevard and Noel-street. The schoolroom floor is sunk 3ft. below the ground, the church being approached by two flights of steps. The school is for 300 scholars with lecture-room, and five vestries, kitchen, &c. Owing to the squareness of the site, it was found advisable to adopt the plan of a Greek cross for the church with radiating pews. The church will seat 360 persons, provision being made for side and end galleries which will increase the accommodation to 600. Nottingham patent bricks are used with red Ruabon dressings. Mr. Swaine Bourne, of Birmingham, is supplying the coloured lead lights, Mr. John Lewin, of Netherfield, being the general contractor. The total cost will be about £3,300. Mr. Fred W. Dixon, of Manchester and Oldham, is the architect, his design having been selected in a limited competition.

## CHIPS.

Mr. Benjamin Howdle, Hull, has been appointed clerk of works and draughtsman to the Penang Municipal Commissioners.

The town council of Mansfield, Notts, have adopted plans prepared by the borough surveyor for the extension of the town-hall, at an estimated cost of £5,000. The extension will provide a public hall seated for 1,000 persons, and a free library.

At Shrewsbury, last week, Councillor John Gethin, a local builder, who has recently returned from a trip in the Mediterranean, taken for the benefit of his health, was formally presented with a gold watch by his employees, some of whom have been in his employ for 22 years, and prior to that, were employed by his late brother, the founder of the business.

In the case of Henry Heinrichs (described in receiving order as Heinrichs and Co., trading as Heinrichs and Co.), Old-street, St. Luke's, New-street, Old-street, Central-street, and Powell-street, E.C., bent-wood furniture manufacturers, the discharge has been suspended for two years ending March 19, 1898.

In the ventilation of the new drill-hall for the Ayr artillery volunteers, Messrs James A. Morris and Hunter, architects, the "Climax" patent direct-acting turret ventilators are used, and have been supplied by Cousland and Mackay, ventilating engineers, Glasgow.

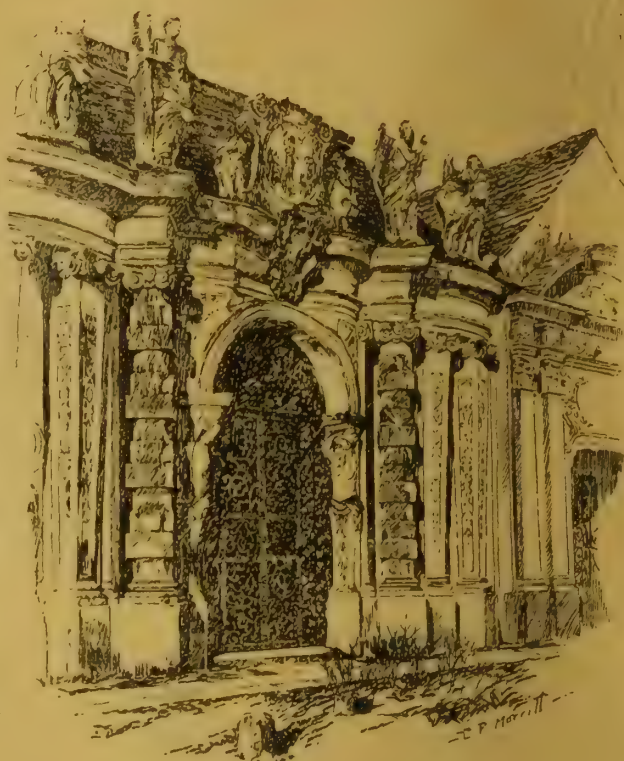
The Blackwall tunnelling operations have now reached the No. 1 shaft, and in the course of a few weeks the shield will be got on to the last lap. Mr. A. R. Binnie, the engineer to the London County Council, has designed the works, which have been carried out under contract by Messrs. Pearson and Sons.

The ceremony of unveiling the memorial to the late Very Rev. William John Butler, D.D., for nine years Dean of Lincoln, was performed by the Bishop of Ely on Saturday afternoon. The memorial, which has been erected in the retro-choir of Lincoln Cathedral, consists of an altar tomb, and it takes the form of a recumbent effigy, life-size, in English alabaster, the figure being dressed in surplice, cassock, and hood. The base and slab on which the effigy lies are of red Verona marble. At the eastern and western ends of the tomb are the arms of the Butler family and those of the Diocese, and on the north and south sides are Latin inscriptions and free translations. The memorial was designed by Messrs. Farmer and Brindley, of Westminster Bridge-road, S.E., and has been executed by M. Chevailland.

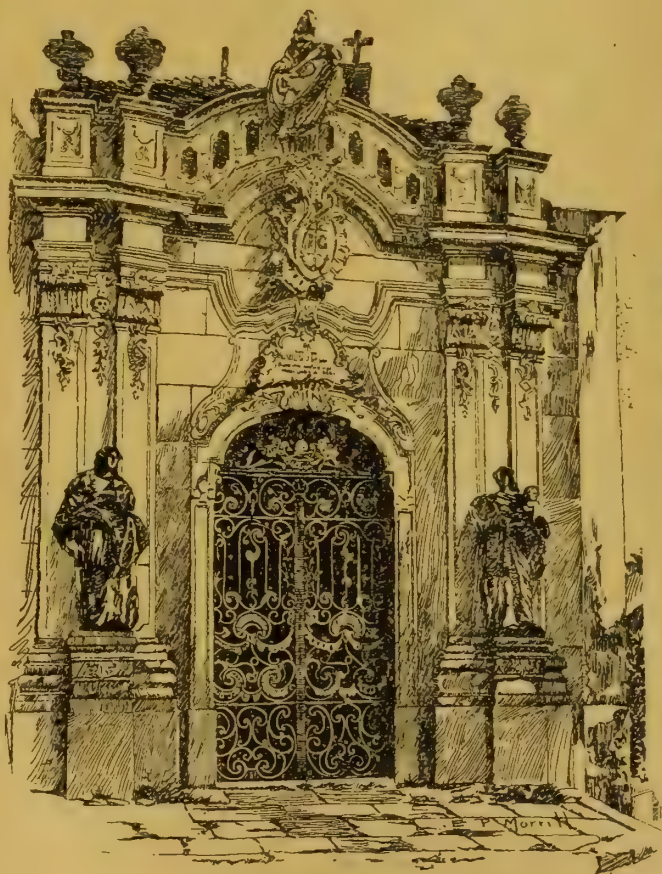




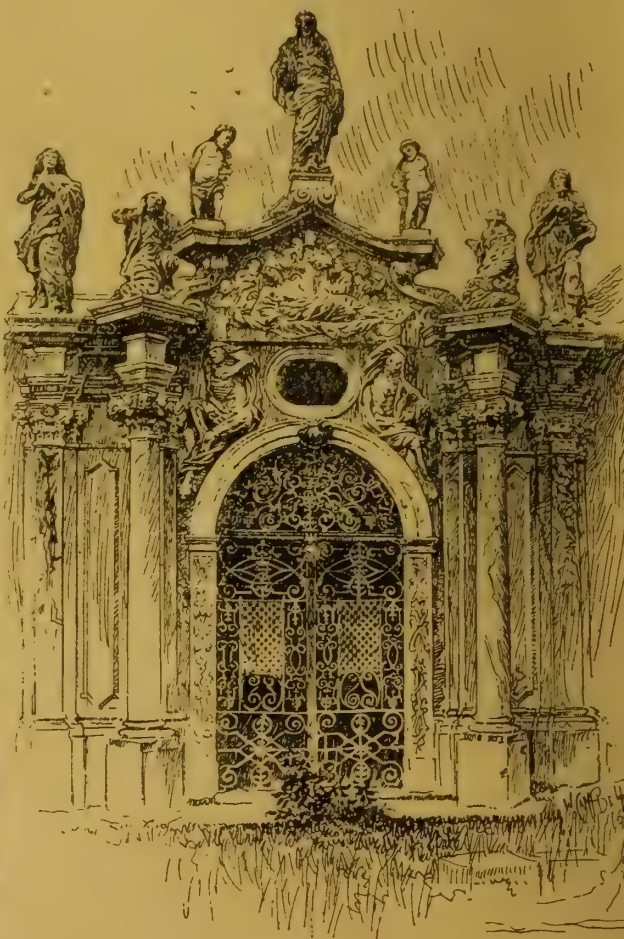
Tomb of the Merchant Kosche, Hirschberg, Silesia.



Tomb of the von Schweinichen Family, Hirschberg, Silesia.



Tomb of Judge Titze, Hirschberg, Silesia.



Tomb of Justice Hess, Hirschberg, Silesia.

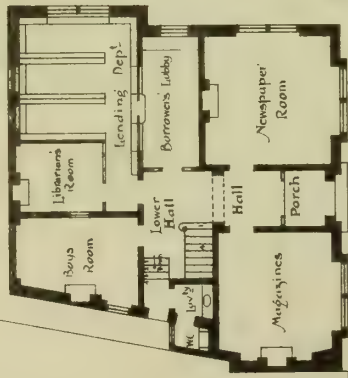




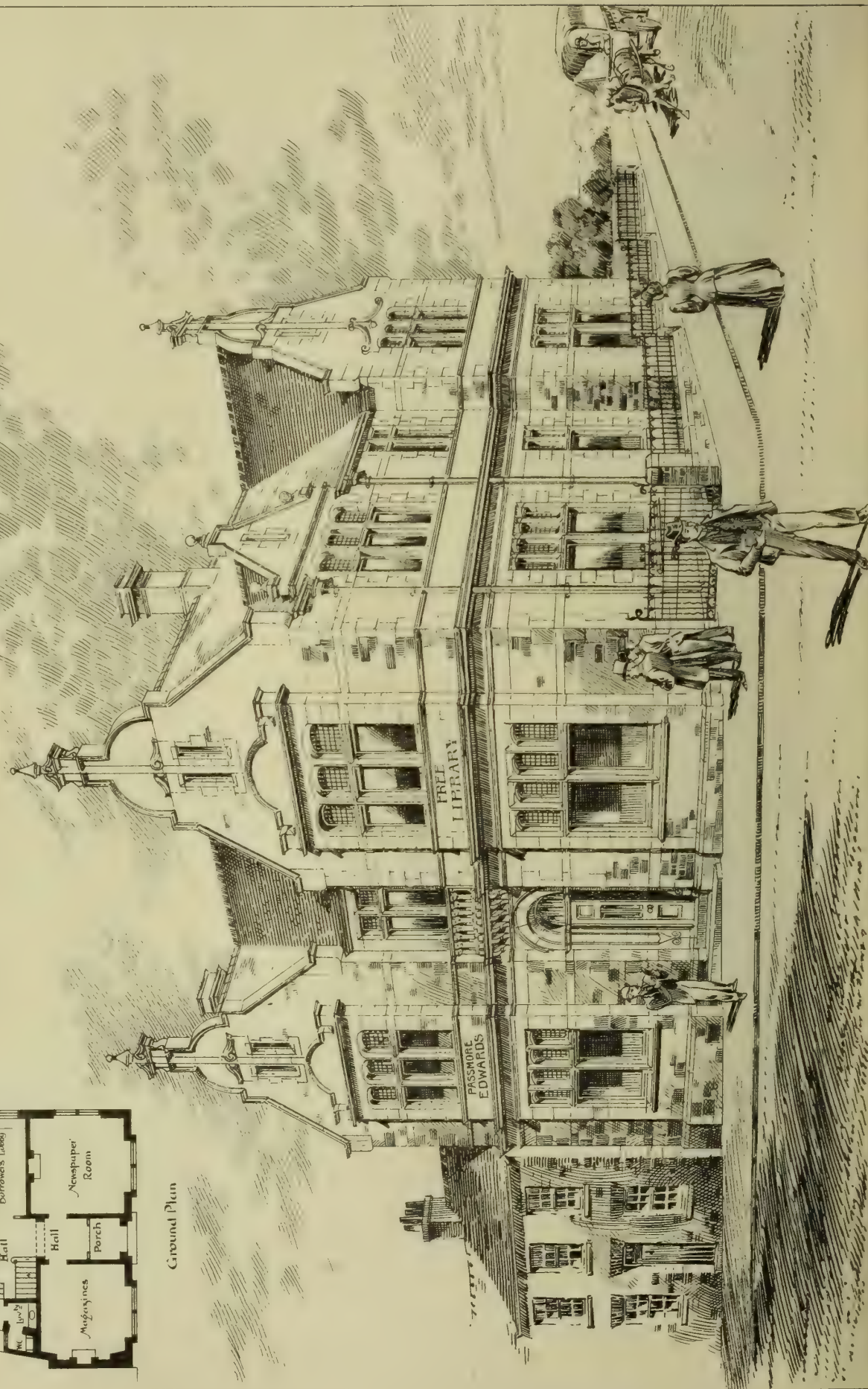


# THE PASSMORE EDWARDS FREE LIBRARY BODMIN.

SILVANUS TREVAIL FRIBA ARCHT.



Ground Plan











ROYAL INSURANCE BUILDING

DESIGN BY JOHN B. HARRIS



WS. MAY. 1. 1896.



PHOTO TINT BY J. H. B. & CO. LONDON

THE LIVERPOOL COMPETITION  
HERFORD ARCH

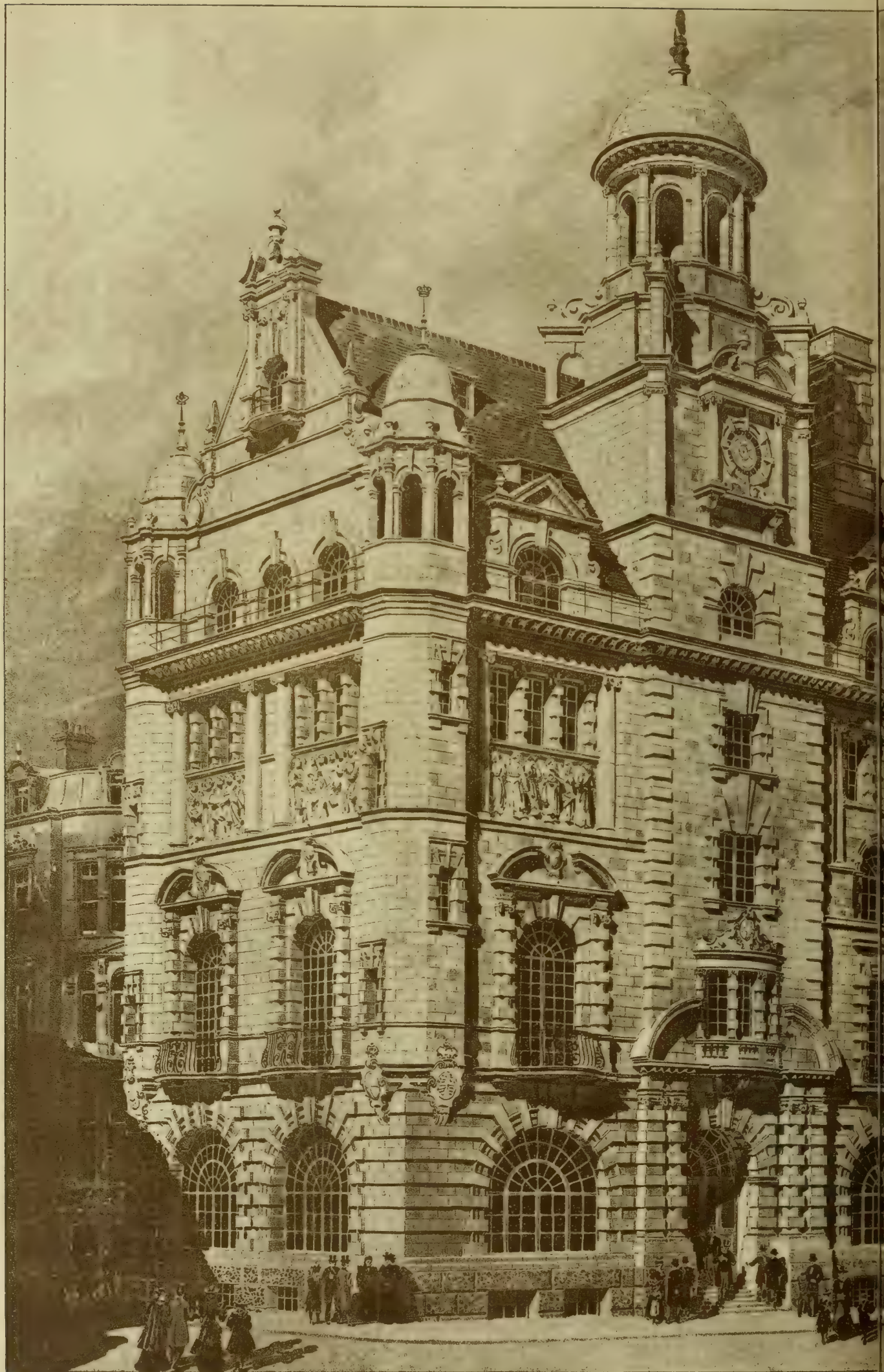












ROYAL INSURANCE BUILDING



18 MAY. 1, 1896.



18 MAY. 1, 1896.

"PHOTO-TINT" by James Akerman. Queen Square London W.

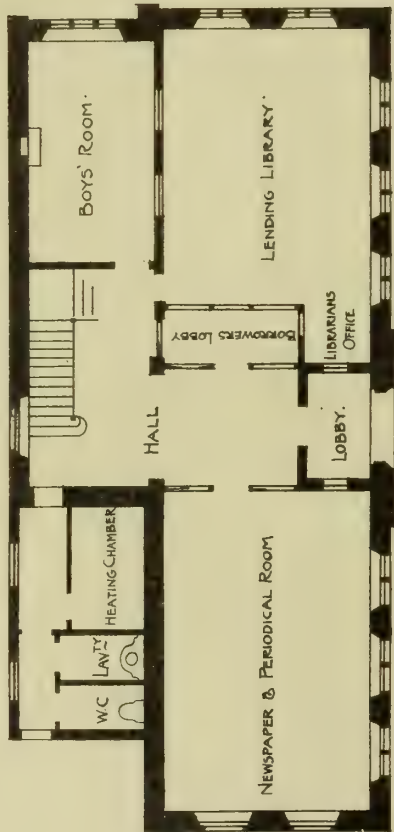




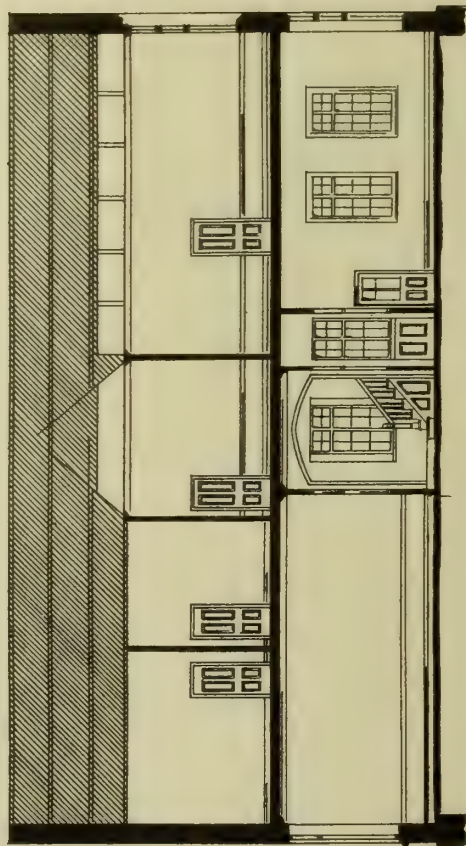








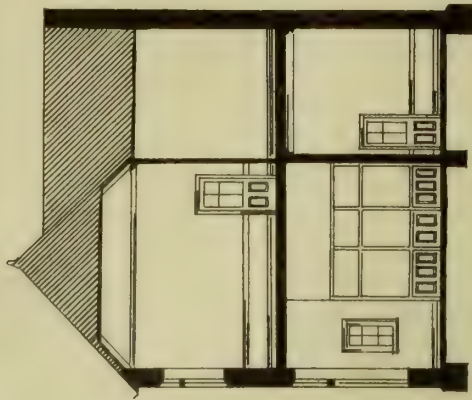
GROUND PLAN.



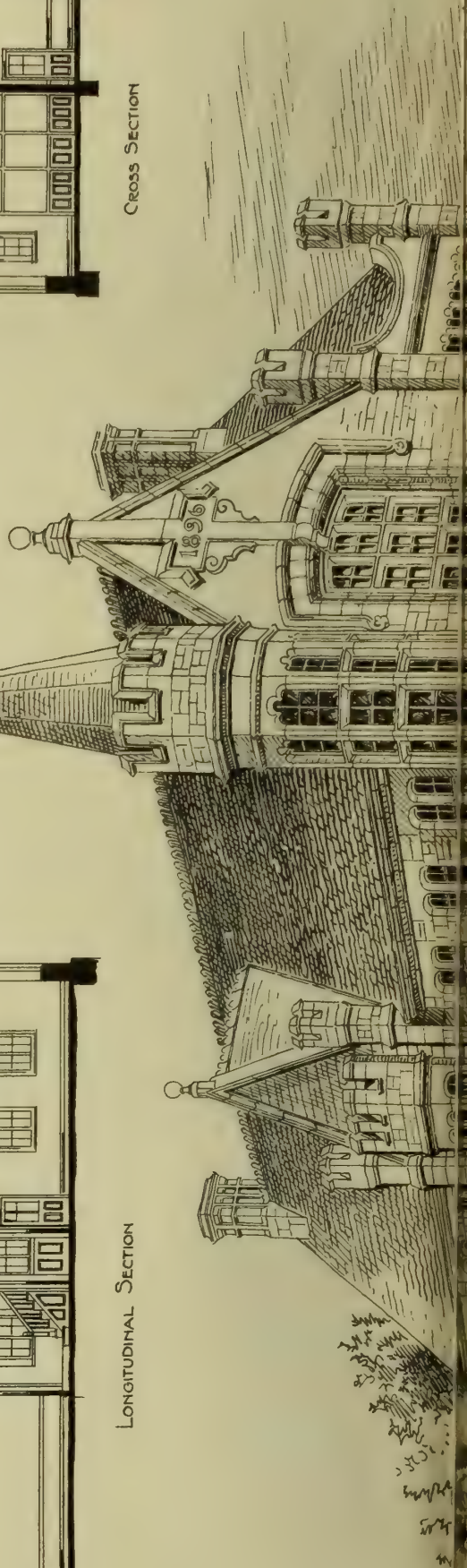
LONGITUDINAL SECTION



FIRST FLOOR PLAN



CROSS SECTION



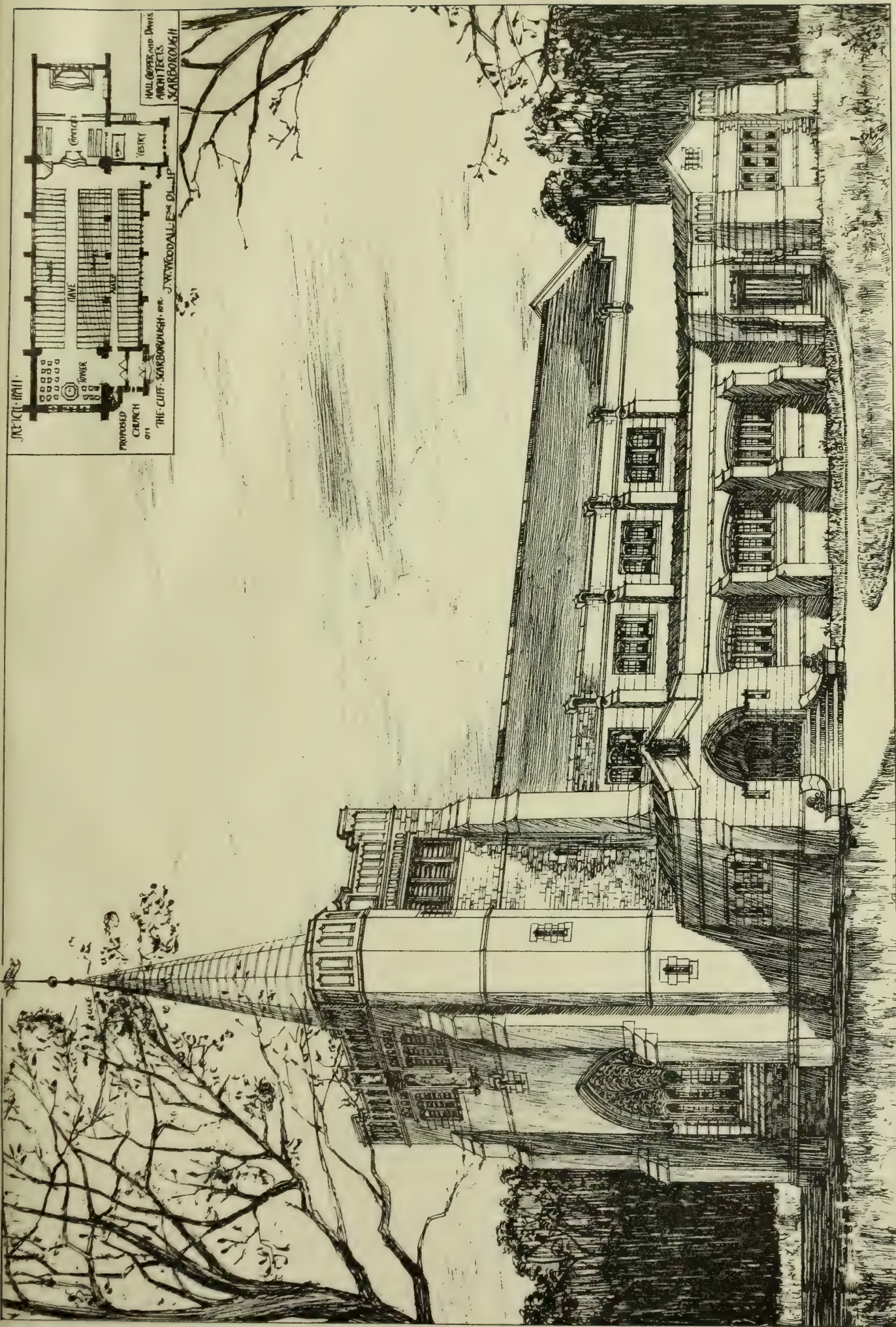












PROPOSED CHURCH ON THE CLIFF, SCARBOROUGH. MESSRS HALL COOPER & DAVIS ARCHT.







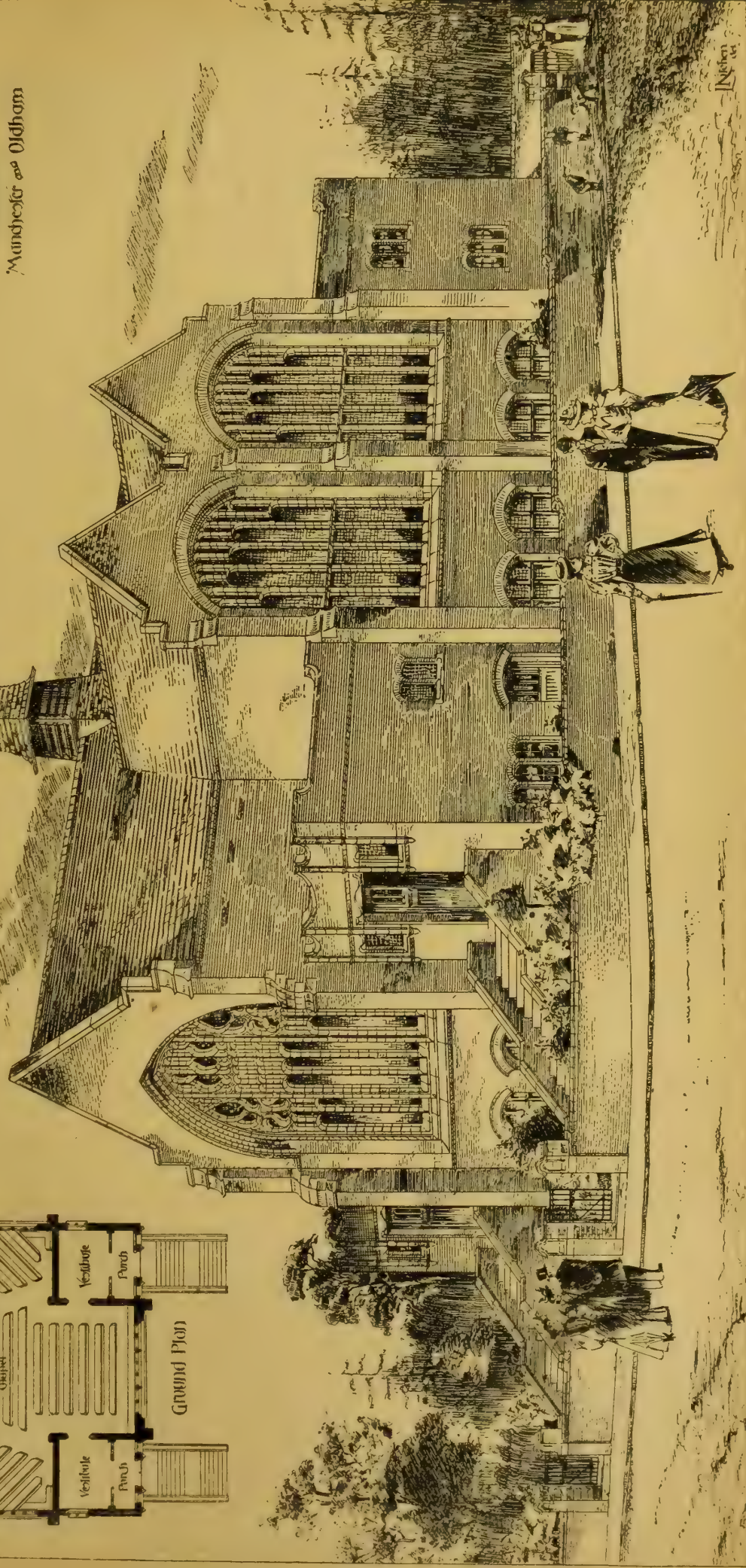
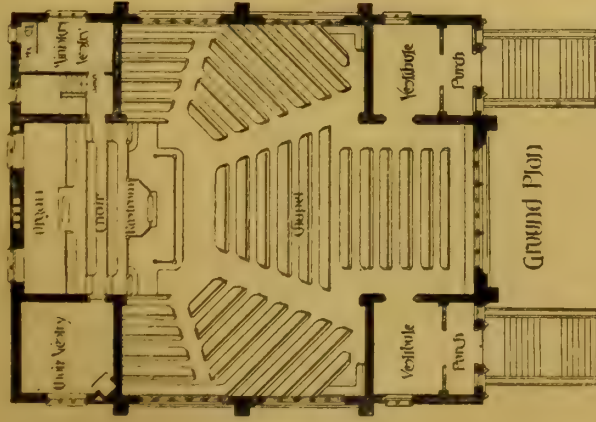
Methodist Free Church: and: School

КОНЦІАН

• T. W. Dixon  
Architect •

Archived

Manchester and Oldham





## Building Intelligence.

**DARLINGTON.**—This town is extending at a rate that should satisfy the most progressive of her citizens. During the past three years up to the end of December last, plans have been passed for over 600 houses, and the corporation are still busily engaged in passing plans for future building operations. A number of houses are being erected on the Greenbank Estate and other parts of the town, and it is contemplated to lay out more streets on the North Lodge Estate. Messrs. Clark and Moscrop have made a commencement with the new road through the Ashcroft Estate, and Mr. T. Barningham is about to build a number of houses near the North End Recreation Ground. In the way of public and semi-public buildings in various stages of construction, may be mentioned the Technical College, the extensive new premises for the North of England School Furnishing Company, the new Union Offices, the children's wing and new dispensary in connection with the Hospital, and the Holy Trinity Day and Sunday Schools. All these are being carried out from the designs of Mr. G. G. Hoskins, F.R.I.B.A.

**DURHAM.**—The Earl of Durham laid, on Monday, the foundation-stone of the new county council buildings in Old Elvet, in the city of Durham. The premises have a frontage of over 200ft.; the front elevation is of red terracotta from Ruabon, and the roof will be of green slates. The site is inclosed by a balustrade of red terracotta, and the main entrance on the ground floor, which is about 6ft. above the level of the street, is approached by a broad flight of steps in red Mansfield stone. The front has been designed with projecting gables, and prominence is given to the central entrance by marking it with a tower, which carries a dome on attached columns, roofed with copper and surmounted with a fleche. The acute angle at the north-west corner has been masked by a smaller tower, which also marks the entrance to the inspector of weights and measures' department. The ground floor contains accommodation for the county councillors, consisting of council-chamber, ante-rooms, committee and retiring-rooms, chairman's room, lobbies, and lavatories. The offices of the clerk are also on this floor. From the main entrance a porch 14ft. by 14ft., lined with terracotta, opens into a hall 24ft. by 18ft. The walls of this hall are divided into panels by attached Doric columns with enriched caps. On either side of the hall are corridors, each 8ft. in width, and continuously lighted from the sides, with also windows at the ends. From the hall also is reached the main staircase; the flights are 6ft. in width, the balustrade is of red terracotta, and the steps of polished green slate, while the columns are of white Parian. Immediately opposite the entrance a door leads from the hall to the ante-room, an hexagonal room 32ft. in diameter and 24ft. in height. The walls will be decorated with panels, filled with ornament in relief. A clerestory of detached Ionic columns, supporting arched windows filled with coloured glass, will light the interior; the ceiling is coved and domed. Between the ante-room and council-chamber, and entered from both are a division lobby and the lavatories. The council-chamber itself is of a horse-shoe form in the lower portion. It contains accommodation for 100 members, who are arranged in semi-circular rows. There is a raised dais for the chairman, with seats for the clerk and vice-chairman. The reporters have seats at the side, and the public are in a gallery. At a height of 12ft. the horseshoe makes a transition into the circle, and so becomes what is probably the only circular council-chamber in the country. It is 45ft. in diameter, and 30ft. high. The walls are relieved by attached columns, clustered into four piers; these carry arches of 28ft. span, which support a dome of 32ft. in diameter. The dome will be enriched with ribs and circular panels with medallions, and the pendentives and coves will be also decorated. A broad frieze will encircle the chamber, and the windows, which are kept well up from the floor, will be glazed with coloured glass. The largest committee-room is 42ft. by 21ft. The offices of the county surveyor's room are on the first floor, as are also the offices of the accountant, medical officer, and education secretary. The second floor contains the library, laboratory, and photographing rooms. In the basement are the caretaker's rooms, store-rooms,

and heating chamber. The building will be heated by low-pressure steam, and the council-chamber ventilated on the plenum system, all by Messrs. Ashwell and Nesbitt. The original estimate by the architects, Messrs. Harry Barnes and Frederick Coates, of Sunderland and West Hartlepool, was £18,081, but the plans were revised, and the accepted tender for the whole of the work, by Messrs. D. and J. Ranken, of Sunderland, was £13,875 10s. The clerk of the works is Mr. J. G. Kilburn. The building will be completed in September, 1896. We illustrated the original design of the architects as selected in competition in our issue of Aug. 16, 1895, by an elevation and two plans.

**EASTLEIGH, HANTS.**—The foundation stone of a new boys' school, in Chamberlayne-road, was laid on Wednesday week. The school, which is being erected by Mr. T. Rashley, of Lymington, from the designs of Messrs. W. H. Mitchell, Son, and Gutteridge, of Southampton, is planned on the central-hall type. Each entrance is to be from a porch into a short, broad corridor, passing a lavatory and cloakroom. The hall is 80ft. long, 30ft. wide, and 25ft. high at the centre, and 16ft. at the sides. Ten classrooms, each accommodating 60 children, surround it on three sides, and the fourth side, facing south, is left open for light. The interior walls will be plastered and coloured, with a Portland cement dado, finished in Parian. The exterior will be faced with red brickwork, with stone sills, labels, and copings to the main front. The school will be heated on the low-pressure hot-water system, from a boiler in the basement. The cloakroom, lavatory, and corridor floors will be of asphalt, and all others of wood blocks. The total cost of the school building, furniture, playgrounds, land, and supervision is £9,063, which, after deducting the cost of half the site (not at present utilised), and its boundary walls, works out to £14 0s. 6d. per head.

**EDINBURGH.**—The new Waverley Passenger Station, for which warrant was obtained in the Edinburgh Dean of Guild Court on Friday, has practically been in progress for some years, the Act for its construction having been obtained after much negotiation with the city authorities in 1891. Much preliminary work has been done, mainly to clear the ground for the new station by removing the goods department from its old site between the North Bridge and Cranston-street to its new site between Cranston-street and New-street, by altering the line of the North Back of Canongate so as to throw it close under the Calton Hill rocks, and by constructing new streets in place of Cranston-street. The rebuilding of the Waverley Bridge is also part of the same scheme. The new North Bridge is being carried out to suit the same comprehensive plan, the Railway Company contributing one-third of the cost of the new bridge. Under the old North Bridge the actual space available for railway traffic was 327ft., divided up into numerous arches, while under the new bridge there will be an available space of 436ft., divided only by two piers, each 18ft. thick. At the North Bridge the width of the present passenger station is 240ft.; but the new station will have a width of 370ft. The walls and roof of the main station will extend a distance of about 1,275ft.; but the platforms will extend for about 100 yards further west. The principal approach will still be from Waverley Bridge; but there will be two inclined accesses in place of one as at present, and the gradient will be slightly improved. Opposite the foot of the inclined accesses there will be a large block of new offices, and also waiting and refreshment rooms. The west portion of this block will contain a booking hall, about 75ft. square, while the principal waiting-rooms will be grouped around it. Four wide passages will lead direct to the platforms. The roof of the new station has been limited by agreement to a height of 42ft. above the rails, a very low elevation for a roof covering such a large area. It will, therefore be carried on light steel lattice girders resting on cast-iron columns. The whole area will be covered with glass. Messrs. Cunningham, Blyth, and Westland, C.E., are the engineers for the works. Messrs. G. and R. Cousins, of Alloa, who are at present rebuilding the Waverley Bridge, are the contractors for the station walls, the new offices, and the mason-work of the inclined recesses.

**GORTON, MANCHESTER.**—The Thomas-street School, the thirtieth erected by the Manchester School Board, but the first board school in

Gorton, was opened on Friday. The work of building the school has been carried out by Messrs. William Brown and Son, Salford, from the designs and under the supervision of Messrs. Royle and Bennett, Manchester. It will accommodate 1,270 children—namely, 400 infants and 870 boys and girls (mixed). The site covers an area of 4,700 square yards, with a street frontage on every side. A caretaker's house is erected at one corner of the girls' playground. The school is planned on the central hall principle. The classrooms are entered direct from the central halls—one on each side of the two floors—and there are separate entrances for boys, for infant boys, for girls, and for infant girls, two at either end of the buildings. The staircases and a lift extend from the basement to the upper floor. In the basement is space for a manual instruction room, 48ft. by 25ft., with a store-room, a cookery classroom, kitchen, and cellars. All these rooms have a clear height of 12ft. 8in. The infants' department is on the ground floor, and there are also on this floor a central hall, 115ft. by 30ft., nine classrooms, two cloak-rooms, and two teachers' rooms. These rooms have a clear height of 15ft. The mixed department is on the upper floor, and includes a central hall, 100ft. by 30ft., and nine classrooms, with cloak-rooms and teachers' rooms, as on the ground floor. The central hall on this floor is 23ft. high, and the remaining rooms 14ft. 6in. in height.

**IVINGHOE, BUCKS.**—An alabaster and marble reredos has just been presented to the parish church by the children of the late Mr. and Mrs. C. Buckmaster, of Ivinghoe-grove, and it was dedicated on Sunday by the Archdeacon of Buckingham. The reredos stretches across the whole width of the choir. The church itself is a fine cruciform building of Early English date, with Perpendicular alterations and insertions. The east window is an insertion in this style, and the new reredos has been designed to harmonise with the 15th-century work. The reredos is executed in marble, alabaster, and Caen stone. The central portion contains a representation of the Lord's Supper, carved in relief in white alabaster, the background being formed of a polished slab of red Victoria marble. The canopy above is of traceried work, with crocketed arches, finials, and pinnacles, and is finished with a moulded and carved cresting, the columns being of Levant marble. The side wings are divided into two bays with moulded and crocketed arches, finials, and pinnacles. The background to the tracery is of white alabaster carved in diaper, each bay being subdivided by traceried work on a coloured alabaster background. The centre column is of Devonshire marble flanked with Brocatella marble. The wings are finished off with a carved cresting as in the centre portion. The work was carried out by Mr. George Porter, of King's-road, Chelsea, and Fulham-road, S.W.

### CHIPS.

The Corporation of Dover received on Tuesday an offer of fifty thousand volumes and eighty thousand prints, together with a quantity of coins, fossils, and pottery, from an anonymous gentleman for the proposed Public Library in Dover, with the curious condition that the donor should be honorary librarian for life, with an annuity of £100. The offer was referred to a committee.

The town council of Penzance have applied to the Local Government Board for sanction to borrow £10,830 for the reconstruction of a portion of the Western Promenade sea wall.

New co-operative premises in Smallgate-street, Beccles, were formally opened on April 22nd. They occupy a corner site, 94ft. by 56ft., and are faced with red bricks, with moulded brick dressings. Mr. Arthur Pells, F.S.I., of Beccles, was the architect, and the builders were Messrs. John Youngs and Son, of Norwich.

At the auction mart, Tokenhouse-yard, the active demand for freehold ground rents, and other favoured securities, is fully maintained, and all investments of good character sell with freedom. Residential properties, only find buyers when required for occupation, and this applies also to houses in suburban districts where rents range over about £50 a year. The aggregate for last week was £124,324, about £50,000 more than was recorded for the corresponding week last year.

The Marquess of Lorne's committee in the House of Commons, gave their assent on Monday to the preamble of the London County Council (Vauxhall Bridge Tramways) Bill. The Bill is promoted to authorise the construction of tramways as part of the new Vauxhall Bridge and approaches.



## COMPETITIONS.

MADRAS.—For the new premises for the Bank of Madras the design submitted under motto "Hope" has been selected and awarded the first premium. The author is Col. S. S. Jacob, C.I.E., R.E. The design is in an Anglo-Hindoo style, and consists of three stories of buildings, the angles of central block and the ends of building at return front being emphasised by open domical copper-covered kiosks of minaret outline. The building is proposed to be faced with pucca brickwork, with dressings of Cuddapah cut stone, and the woodwork will be of teak. The estimated cost is over £25,000 sterling.

## CHIPS.

Mr. William Clark, builder, Ayr, is the successful contractor for the work of the Newton esplanade, to be constructed by the Glasgow and South-Western Railway Company.

It has been decided to erect an organ in Thornton parish church to the memory of the Brontë family. The Rev. Patrick Brontë was for some time vicar of the parish, and it was at Thornton that his illustrious daughters were born. The organ is to be built by Messrs. Harrison and Harrison, of Durham, and will cost £1,000.

A correspondent in the *Lancet*, signing himself "M. B.," states on the authority of a patient who has had thirty years' experience of working in teak, that "if the smallest splint pierces the skin, or if the skin gets abraded in the slightest degree when a carpenter is working with teak, the place is sure to inflame and suppurate." What has been the experience of our readers who have worked in teak?

An organ which has been placed in Drayton Bassett Church, near Tamworth, was dedicated by the Bishop of Lichfield on Friday. The instrument, which cost 200 guineas, was built by Messrs. Harston and Sons, of Tamworth.

Colonel Durnford, Local Government Board Inspector, held an inquiry at the corporation offices, Bank-street, Bury, Lancs, on Friday, into the application of the Bury Corporation to borrow £15,000 for the purpose of completing the gasworks siding, £8,000 for cleansing and scouring Barn Brook, and £2,400 for the formation of a new road at Eltonfold. Mr. J. Cartwright, borough engineer, produced and explained the plans.

Mr. R. P. Wilcox has been selected for the appointment of secretary and engineer to the Moulmein municipality.

The Manx Legislative Council passed a Bill on Friday to enable the Ramsey Town Commissioners to borrow £71,534, with which to discharge existing loans amounting to £68,500, the balance to be applied for carrying out sewerage improvements.

The office-bearers appointed for the ensuing session of the East of Scotland Engineering Association include Professor Armstrong as honorary president, Mr. E. H. Fairgrieve as president, and Messrs. John Robb and Robert Boath as vice-presidents.

Mr. Edward J. N. Stent, who died on April 12 in Bayonne, New Jersey, was well known as an architect and decorator, especially in the ecclesiastical branch of the profession. He was of English birth, and had been an extensive traveller. He had made church architecture a speciality.

The foundation-stone of the new North Bridge at Edinburgh will be formally laid by the Lord Provost of that city on May 25th.

The cost to the corporation (or, more correctly speaking, the ratepayers) of Leeds for sanitary works in that city was last year £63,156, including the medical officer of health's and sanitary inspectors' departments, and the up-keep of the fever hospitals, cleaning of streets, and destructors. This year the estimate is still higher—viz., £65,407, or about equal to a shilling rate on the city.

Mr. Mark H. Judge, A.R.I.B.A., hon. secretary of the Sunday Society, writes stating that the experiment of opening the South Kensington and Bethnal-green museums on Sundays from 2 to 6 has been so successful that next Sunday and until further notice the museums will be open from 2 till 7. The number of visitors at South Kensington last Sunday was 4,532. The arrangements for the Sunday opening of the British Museum in Bloomsbury, the National History Museum at South Kensington, the National Gallery and the National Portrait Gallery in Trafalgar-square are nearly completed.

The clerk to the Kesteven (Lincolnshire) County Council has received an amended award from Mr. Robert Vigers, F.S.I., the arbitrator appointed by the Home Secretary to settle the dispute between the various asylum authorities in Lincolnshire. Under the amended award, the borough of Grant-ham will receive the sum of £1,966, and the county of Kesteven £21,993, making £23,959 altogether.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On Saturday afternoon a large party of the members of the Edinburgh Architectural Association and friends visited the Island of Inchcolm and the very interesting Abbey of St. Columba. In his unavoidable absence, a paper by Mr. H. J. Blanc was read by Mr. Thomas Ross, vice-president of the association. In it he stated that the abbey exhibited evidences of four periods of building operations—first, the hermit cell, or oratory, of the sixth century; next, the church, followed closely by the cloister buildings, about 1163; third, the chapter-house and new choir of 1265; and finally, the abbot's lodging and porter's lodge, and the Lady Chapel of the beginning of the 15th century. The various parts of the group of buildings were described, and their salient features brought out in detailed explanations by Mr. Ross.

MANCHESTER SOCIETY OF ARCHITECTS (INCORPORATED).—The annual general meeting of this society was held on Tuesday in last week at the Accountants' Rooms, King-street, Manchester, the president, Mr. John Holden, in the chair. The following officers and council were elected for the session 1896-7:—President, John Ely; vice-presidents, R. I. Bennett and R. Knill-Freeman; honorary secretary and treasurer, Paul Ogden; assistant honorary secretary, Edward Hewitt; members of council: Fellows, Thomas Chadwick, A. H. Davies-Colley, John Eaton, John Holden, F. W. Mee, J. D. Mould, W. A. Royle, Edward Salomons, and J. H. Woodhouse; Associates: J. S. Hodgson, H. E. Stelfox, and P. S. Worthington.

Investigations made by Dr. Carl Müller, and reported in *Himmel und Erde*, show that lightning prefers to strike certain kinds of trees. Under the direction of the Lippe-Detmold Department of Forestry statistics were gathered showing that in 11 years lightning struck 56 oaks, three or four pines, 20 firs, but not a single beech tree, although seven-tenths of the trees were beech. It would seem, then, that one is safer in a storm under a beech tree than under any other kind.

A scheme for the enlargement of the parish church of Eastleigh, Hants, will be submitted to a meeting to be held this (Friday) evening in that growing railway centre. Plans for the enlargement have been prepared by Sir Arthur Blomfield, which will increase the church to nearly three times its present size. The present building, which only seats 350, will form the north aisle of the new church, which will accommodate from 950 to 1,000 worshippers. The cost of the enlargement is estimated at £8,000.

Mr. William Pitt Wentworth, one of the oldest architects of Boston, died in Newton, Mass., on April 12. He was a native of Vermont, and removing to Boston about 30 years ago, he became prominent as a designer of churches and hospitals. Among the hospitals which he had planned are the Newton Hospital, the Lynn Hospital, the Washington Home in Boston, and he was the architect of the insane hospital now in process of construction by the State of Massachusetts in Medfield.

We learn that Messrs. C. Isler and Co., of London, have completed artesian bored tube wells on their improved system, and have obtained copious supplies from the new red sandstone and other formations, at the following breweries and mineral water manufactories:—The South Staffordshire Brewery Co., Wolverhampton; Messrs. Bucknall and Co., Kidderminster; Grand Hotel, Birmingham; Messrs. W. J. Rogers, Limited, Bristol; Middlesbrough and District Mineral Water Co., Middlesbrough; Messrs. Arnold Perrett and Co., Wickwar; Mr. Thomas Lakeman, Brixham; The Farmers' Brewery Co., Everton; Leicester Brewing and Malting Co., Limited, Leicester; Messrs. Hooper, Struve, and Co., Tottenham-court-road, London; and two artesian bored tube wells have quite recently been completed—one at Marden, for Messrs. Jude Hanbury and Co., and one at Horley, for Messrs. Youell and Elkin.

At Llandudno Police-court, on Monday, eight journeyman house-painters, now on strike, were each fined 10s. and costs for intimidating Charles Hanley, of Wolverhampton, who had been imported to fill up a vacancy. The intimidation consisted of hooting Hanley as he was passing to his work, and though he declared he was not frightened, the Bench held that intimidation within the Act had taken place.

A Local Government Board inquiry was held at Winchester, on Friday, before Mr. J. H. Tullock, C.E., concerning a loan of £2,000 towards purchasing, and laying out as a road, the land from Colebrook-street, under the city walls, to College-street, and another loan of £270 for Guildhall excess expenditure.

## Correspondence.

## THE INSTITUTE AND ITS FINANCES—A DEFICIT.

To the Editor of the BUILDING NEWS.

SIR,—Members of the Institute may recollect that last year Mr. Fredk. Todd and myself, as auditors appointed by the Institute, presented a report on the financial condition of that body, which, because we recommended certain economies in the administration, the council declined to publish with their own advanced report, and that, therefore, the members generally were kept in ignorance of our report until the evening of the annual general meeting, when, of course, it was too late to be of any service.

This year (having been again appointed auditors) we carefully abstained from recommending economies, and confined ourselves in our report to the endeavour to make clear to the members the real financial condition of the Institute, and to solve, as far as possible, some of the enigmas which appear to be inseparable from an officially-prepared document. We went further, and qualified our certificate of examination by a reference to our report as auditors attached thereto. We also wrote to the council, and pointed out that our report should, to be of service, appear side by side with the council's report, so that members might be in a position to discuss the subject with intelligence at the annual general meeting next Monday evening.

It will scarcely be believed that, notwithstanding our decided requests for publication, the council have suppressed our report from that which they have just sent to every member, merely making a note to the effect that it will be brought before the members next Monday.

The reason of this is obvious: Our report is hardly pleasant reading to an extravagant council—the balance, a heavy one, is on the wrong side of the account, and the meeting next Monday being confined to members only (reporters not being admitted), the council will be able to concentrate a report of the criticisms on its tactics to its own *Journal*, edited by itself; and as it has practically re-elected itself for another year, we may look forward, hopefully, for a further increase in the balance under the head of "deficit."

It must be distinctly borne in mind that the auditors are elected by the *Institute*, and not by the council, and that the by-law clearly states that the auditors are to report to the *Institute*. It is, therefore, to my mind an unwarrantable interference with our prerogative on the part of the council to suppress our report, and I trust that the members who have the best interests of the corporate body at heart will attend the meeting next Monday evening and support me in the endeavour to prove to the council that they are not at liberty to play as they please with men elected by the Institute to perform a specific duty.—I am, &c., WM. WOODWARD.

13, Southampton-street, Strand, April 28th.

[It certainly seems desirable that the members of the Institute should attend next Monday night, and find out where the money is actually going to. It may be that the great majority approve of the expenditure which is being incurred for certain purposes, in which case no one has any right to complain; but, if so, why this apparent desire on the part of the council to suppress the auditors' report?—Ed. "B.N."]

## ARCHITECTS AND QUANTITIES.

SIR,—As a hitherto constant reader of your paper, I am somewhat surprised to find you publishing such a biased attack on my profession, as the first article in to-day's issue undoubtedly is. Apparently it is entirely in favour of the architect preparing quantities.

In the first place, I may state that although I mostly work for architects, I occasionally act for contractors, and I have frequently been told confidentially that the contractors almost invariably price architects' quantities considerably higher than surveyors' quantities, because of the fact you mention of the architect skinning things down too much with a view of trying to cheapen the building, while if a surveyor is employed, they feel safe on that point; and then, again, a properly qualified surveyor will prepare his quantities thoroughly in detail in accordance with the price books, and such items as "No. 1 staircase, three floors high, &c.," "No. 1 stone and all labour in church spire, 70ft. high," "No. 1 public house,



counter—feet long, as sketch," will not be found in the professional quantity surveyor's quantities; but these and similar items have and do frequently occur in quantities prepared by architects.

We also find another fact which bears out my statement that the employment of a quantity surveyor is preferable to the quantities being prepared by the architect, and that is the much closer tendering by the contractors. I have often noticed that the tenders seldom vary more than 10 or 15 per cent. where a quantity surveyor has been employed; but, on the other hand, they frequently vary 30 to 50 per cent. or more when the statement "Quantities by the architect" appears.

Of course, occasionally an architect may prepare his quantities properly, and where two men are in partnership, one may be an expert surveyor, and prepare faultless quantities; but even in these cases the contractor feels that it is to the architect's interest to prepare quantities which can only be characterised as unfair, and feels he must allow a margin accordingly.

I also beg to take exception to the statement that the surveyor can measure to excess, and run up cost of the building to an unlimited extent, as your article suggests;—his position being somewhat between the Devil and the deep sea, because if the quantities are short the builder objects, while if the building costs too much, as can easily be checked by the cubic foot cost of other similar buildings, the architect will easily find it out.

The surveyor's best interest is, therefore, served by steering a middle course; on the one hand measuring absolutely net, and on the other hand preparing the quantities in sufficient detail, and measuring labours which ought to be measured, and thus providing a perfectly fair and impartial basis for tendering. The above remarks also apply to settling up extras and omission on contract.

The employer who is wise and wishes to obtain a building properly carried out on the lowest cost, and desires to avoid disputes over extras and omissions, will do well to insist on a quantity surveyor being employed for the quantities.—I am, &c.,

ALEXANDER H. KINDER.

23, Finsbury-circus, London, E.C., April 24.

#### DEVONSHIRE CHURCH SCREENS.

SIR,—It may be well to point out that when, after reading the paper upon the above subject, Mr. H. A. Saunders asked me whether Decorated ecclesiastical oak work existed in Devonshire, I took the query as referring to colour, and not to the name, first given, I believe, by the late Mr. Rickman, to 14th-century work. As a matter of fact, I know of no Decorated woodwork amongst the screens, pulpits, or font-covers of Devon's churches. And, replying further to the same gentleman, I referred, or meant to refer, to the 16th-century screen in the north aisle at Atherington Church, as the only one in which an old gallery in its entirety is still preserved in the county. In character, although a smaller screen, it is much like the one at Lapford, which seems to have been done by the same school of men. Atherington's screen consists of four and a half bays, cut and adapted to its present position in a somewhat awkward way. When I saw it last (the church has been restored since, and the screen has possibly been altered), the south end of the screen overran the width of the aisle and projected into the nave, cut away at the pier arch. This suggests that it was never originally intended for its present position. Above the groining and cornices there is a superstructure forming a gallery of five bays, with canted ogee canopies. The back (eastern face) is only plain boarding, with a rude royal arms and the words, "GOD SAVE THE CHURCH, OUR QUEEN ELIZABETH, PEACE AND TRUTH IN CHRIST; AMEN," upon it. The only other old screen with a gallery is at Atherington. Both it (the gallery) and the groining beneath are all new. We made them in 1890-91, from the designs of Mr. Bligh-Bond, architect. The only two fragments of the original gallery at Staverton I had pleasure in exhibiting at the lecture just referred to.—I am, &c.,

HARRY HEMS.

Fair Park, Exeter, April 25.

A fire raged for five hours on Sunday morning in the shipbuilding yard of Messrs. Gourlay Brothers, Dundee. The workshops and sawmills were all reduced to ruins, and quantities of valuable timber and fittings were consumed. The amount of damage is estimated at £15,000. Two hundred men will be thrown out of employment.

## Intercommunication.

### QUESTIONS.

[11504.] **Descending Smoke-Flues.**—I observe in Mr. Waterhouse's report, 1897, upon his designs for the Law Courts that he proposed the adoption of descending down-cast smoke-flues communicating by a main horizontal flue with a chimney 300ft. high. He cited the case of Osmaston Manor, Derbyshire, as a case where the same principle had been successfully adopted. To what extent has the system since been applied to houses, hospitals, and public buildings, and with what result?—**SMOKE-TOWER.**

[11505.] **Automatic Gate.**—Can any reader kindly give me details about an automatic gate for an avenue, which opens on the approach of a vehicle, and closes when same has passed?—**BLAZER.**

### REPLIES.

[11502.] **Noiseless Paving for Stables.** I do not know of any paving blocks for stables which are noiseless. Cork bricks, and such-like materials, would soon be kicked to pieces, and would also become offensive from their absorbent tendency. I think the most practical way for "A. B." to attain his object will be by carefully lining the walls with some efficient deafening substance, preferably plaster slabs padded on one side with silicate cotton. These slabs are excellent non-conductors of sound, and not expensive. They are Fredk. Jones and Co.'s patent.—**G. BRACHMORZ**, 119, Prince of Wales-road, N.W.

[11502.] **Noiseless Paving for Stables.**—In reply to "A. B.'s" inquiry, cork pavement is the most suitable material for paving stables, more especially where it is desired to deaden the sound. I have seen it laid at several places. Where it particularly took my fancy was at Messrs. Tattersall's yard at Albert Gate.—**P. T. PEREY.**

[11503.] **Riga White Floors.**—"R." states he has been told Riga white prepared flooring is very good, &c., and asks for information thereon. I am not aware there is any export trade done from Riga in prepared white flooring. What boards come on this market are imported in the rough, and prepared at the ports or in the inland towns. The qualities of these boards are "unassorted," i.e., all qualities shipped together, and they are not all square-edged. One inch in thickness is the standard, but occasionally 3/4 in. and 1 1/4 in. are shipped. The widths run from 5 in. to 11 in., but nothing over 7 in. is manufactured into flooring. They are invariably shipped unmarked; in some cases the shipper's initials may be stencilled or hammered on. The export port is, of course, Riga, the winter or open port of which is Libau. This latter port has a wood trade of its own, but it is seldom that such low-priced goods as Riga white boards are shipped through this agency. As to "defects and what to be avoided," I may start with the remark that it is the lowest grade of whitewood shipped from the Baltic, all the Swedish, Finland, and St. Petersburg boards being superior. Riga wood is soft, quick grown, subject to great shrinkage, and sappy, and the boards, being made from the outsides, are largely sapwood. When in good condition this defect is not patent to an inexperienced eye; but if shipped or stored in wet or poor condition, they compare badly with ordinary whitewood when wrought into flooring. Stored in our yards as shipped, they may be distinguished from other whitewoods by their coarse or open battedness, and in being roughly sawn. What to avoid if "R." wants Baltic whitewood flooring is this shipment of boards, and in adopting any other to see that it is of average length. As a rule, the shorter the average length of whitewood boards, the commoner and more sappy the wood. A fair average is 15ft. to 16ft., but some will drop down to 13ft. Others, as St. Petersburg, will occasionally rise to 18ft. Riga boards are invariably short.—**WM. STEVENSON**, Hull Timber and Sawmill Co., Hull.

### CHIPS.

The memorial-stone of Polmadie United Presbyterian Church, Glasgow, was laid on Saturday. An expenditure of £3,150 is estimated in connection with the new building.

The Swedenborgian church, of which the corner stones have just been laid in Anvil-street, Blackburn, is being erected to replace one which has been removed because it had been found to be insecure. The cost of the new building is estimated at £2,000.

The urban district council of Knighton have elected Mr. D. Lewis, of that town, as surveyor.

The Wesleyan chapel at Flaxton, near York, was reopened after alteration on Tuesday week. Mr. E. Taylor, of York, was the architect, and Mr. G. Mansfield, the contractor.

The Belfast City Council have had conditions prepared by the city surveyor for information of competing architects, who shall furnish plans and designs for the erection of a city hall on a portion of the site now occupied by the Linenhall Grounds. Of this area of five acres, it is proposed to build on one acre, and to lay out the remainder of the site as open space and ornamental grounds. The scheme is to be further considered by the corporation on Monday, June 1.

The death of Mr. Jagannath Sadashivji Hate, A.M.I.C.E., the water-works engineer of the Baroda State, is announced at the age of 70 years.

An oil portrait of Mr. F. J. Johnstone, C.I.E., late chief engineer and secretary, Public Works Department, Bengal, has been hung in the Town Hall at Calcutta.

## Legal.

### COVENANTS AGAINST ANNOYANCE.

**M**OST leases contain a covenant by the lessee that he will not do anything which shall be a nuisance or an annoyance to the lessor or his other tenants, or the neighbours. Such a covenant is often useful in preventing lessees from injuring the letting value of the place they occupy, or the surrounding premises. But the covenant requires to be construed reasonably, and with regard to the kind of property and the locality to which it relates. In a recent case (*Times*, April 25) before Mr. Justice Romer, the Holborn Viaduct Land Co., Ltd., took rather too strong a view of their rights and powers as against a lessee who had entered into such a covenant. It appeared that the Our Boys' Clothing Company, Ltd., occupied the first, third, and fourth floors of a house on Holborn-viaduct held by them on lease from the land company, and which contained a covenant by the lessees that they would not do anything which may grow to the injury, annoyance, disturbance, or inconvenience of the lessors or their other tenants or neighbours. The clothing company, desiring to push their business, put up a large advertisement right across their first floor premises, announcing "An eccentric and startling stock-taking sale for 14 days." No doubt it was an ugly and obtrusive thing, as is the nature of such boards to be. The land company promptly required their lessees to remove it, and as they did not do so, the lessors, a few days after, pulled it down. Now the clothing company came to the Court for an injunction to stop this sort of thing, and their landlords counter-claimed an injunction to restrain any such breach of the covenant.

The question for the judge was, of course, whether the putting up of this board was contrary to the lease. Mr. Justice Romer came to the conclusion that it was not. He pointed out that the Holborn Viaduct was a purely business locality, where advertisements of this kind would not frighten the tenants away. The plaintiffs, as shopkeepers, having an ordinary summer sale on, sought to advertise it in the usual style. Such a big board might be an eyesore to sensitive persons; but the whole neighbourhood had to be considered, and as the lower portions of all the houses were let out as shops, there was nothing in the plaintiffs' display which was unreasonable or out of character. The defendants had been in the wrong in their view of the covenant, so they had to pay all costs of the action, while it was declared that the plaintiffs had not broken their lease.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday morning* to insure answer same week.

**H. W. M.—SEASHORE.—WATER LINE.**—I can only suggest that you should inquire of the officials in the locality.

**QUERIST.—COURT LEET.—FINES.—DISTRESS.**—These old local and customary courts retain their ancient powers and jurisdictions, unless taken away or modified by statute. Better consult a local solicitor.

**P. S.—COMPETITION.—DAMAGES.**—You can raise the question by an action, as you suggest; but it would have to be in the county-court, I should say, and it looks doubtful.

The work of restoration of Winchester Cathedral roof has been practically begun by Mr. John Thompson, of Peterborough, and will, it is expected, occupy about two years before completion. During preparatory work it was necessary to excavate a drain for water from the engine working the steam crane. This has resulted in the discovery of one or two chalk coffins with their bony occupants, which no doubt are burials of the brethren of the ancient Benedictine Priory. The coffins were about 2ft. under the surface.

The Flavel Memorial Congregational Church at Dartmouth was opened last week. The style is Gothic. The walls are of dressed limestone. The church consists of nave, 58ft. 6in. by 38ft., with a recessed organ-chamber at the west end. The roof is framed in single span, and rises to a height of 48ft. to the apex. The organ is being re-erected by Messrs. Hele and Co., the original builders. The general seating is of pitch-pine. The accommodation provided, including the gallery, is for about 400. The main contractor was Mr. R. T. Pillar, of Lower-street, Dartmouth, and the cost will be £2,000. Mr. E. H. Back, M.S.A., Dartmouth, was the architect.



## LEGAL INTELLIGENCE.

**FIREPROOF FLOORING PATENT CASE.**—**FAWCETT V. HOMA AND ROGERS.**—(Chancery Court No. 111. Before Mr. Justice Romer.)—The hearing of this case occupied three days last week, and judgment was given on Wednesday, April 22. The claim of the plaintiffs was substantially that the defendants had infringed their patent. Expert and professional evidence was heard at some length on both sides. In the end, Mr. Justice Romer, in a most carefully worded judgment, decided that the plaintiffs' patent had failed, and the action must be dismissed. The plaintiffs have lodged notice of appeal.

**THE CENTRAL LONDON RAILWAY TERMINUS AT SHEPHERD'S BUSH.**—On Saturday, before Mr. Under-Sheriff Burchell, and a special jury at the London Sheriffs' Court, the hearing was concluded of the claim of the Woodhouse-park Syndicate for £28,000 as compensation for their interest in the Woodhouse-park estate, Shepherd's-bush, about to be acquired by the Central London Railway Company for a central and germinating station in connection with the new electric railway about to be constructed between Shepherd's-bush and the City. The claimants are leaseholders of the estate under the Ecclesiastical Commissioners, paying a rent of £200 a year, and the lease has 1½ years to run. The jury awarded the claimants £4,500, with 10 per cent. additional for compulsory purchase—in all £4,950.

**"BLACK LISTS" OF WORKMEN.**—**TROLLOPE AND SONS AND OTHERS V. THE LONDON BUILDING CONFEDERATION AND OTHERS.**—This case, heard by Mr. Justice Hawkins and a jury on Tuesday and Wednesday, was a proceeding in which the plaintiffs asked for an injunction to restrain the defendants from publishing in their "black list" the names of workmen who were employed by Messrs. Trollope and Sons, builders and contractors, in Grosvenor-road. The defendants pleaded, claiming the right to do what they had done. Mr. Carson, Q.C., in opening the case, said that the question was, Had the defendants, or had any body of men, the right to publish such a document as he would produce to the jury with the intention to maliciously injure other persons in the process of carrying on their business? Messrs. Trollope and Sons were contractors, Mr. Eves, another of the plaintiffs, was a sub-contractor under them to do brickwork, whilst the other plaintiffs were Mr. Iliffe, a foreman in the employ of Messrs. Trollope, and also a number of workmen employed by them. These persons complained that they had been put into "Trollope's black list." The defendants were the London Building Trades Confederation, and the Secretary and Executive Committee of the Association. In October, 1894, the defendant association and their executive committee called out the men who were working for Messrs. Trollope, and the first intimation that the firm had of this was a letter from Mr. Burden, the secretary of the federation, saying that complaints had come to them as to what had been done by them. There had been a dispute between masters and men, and an arrangement had been come to that there should be no distinction made between trades-union workmen and free-labour workmen, and the Building Trades' Confederation agreed that there should be no distinction made between the two bodies of men. The complaint made against Messrs. Trollope was that they were rejecting trades-union men, and that only free-labour men were employed. It also seemed that Mr. Eves, the sub-contractor, and Mr. Iliffe, the foreman, were objectionable to the confederation, and it was required that they should be discharged. Messrs. Trollope positively refused to break or to terminate their engagements with these men. The federation, therefore, called out Messrs. Trollope's workmen for the 1st November, 1894. In obedience to this call, 170 men left them on the day named, and the usual picketing followed. Upon the 27th November, 1894, a motion was made that 1,000 copies of the "black list" should be got out in reference to Trollope's jobs. He produced to the jury a copy of this document. (It was a large yellow poster, surrounded by a black mourning border.) In this every man who was engaged or employed by Messrs. Trollope upon their various jobs was specified. What was the motive and object in publishing this list? The Court of Chancery had already granted an interlocutory injunction to restrain the publication of this "black list," but that Court also thought it fit to send the matter down to a special jury, that they might say what was the real object in sending the list out. He contended that the object could be nothing but to prevent Messrs. Trollope from employing certain men, and to prevent those men from getting employment elsewhere. Mr. George Howard Trollope, one of the plaintiffs, was called, and said that the instructions that were given to their foremen were to carry out the agreement which had been come to in 1892, as to no difference being made as to the employment of union men and free-labour men. The federation said that a difference had been made, and they also said that so long as Messrs. Eves and Iliffe were in their employment they would not be

satisfied. There were eleven unions connected with the federation, and the effect of a man's name being inserted in the black list would be that none of the men denounced would get employment elsewhere, and the continued publication of the placard might cause serious injury to his firm in preventing them getting contracts, as many people would not care to employ a firm which was subject to these contentions. The hearing is not concluded.

**COUNTY COUNCILS AND FOOTPATHS.**—**DERBYSHIRE COUNTY COUNCIL V. MATLOCK BATH DISTRICT COUNCIL.**—In the Court of Appeal, on Tuesday, before Lord Herschell, Lord Macnaghten, Lord Morris, and Lord Davey, judgment was given in the appeal from a decision of the Court of Appeal, affirming a judgment by Mr. Justice Wright, the Queen's Bench Division, in a cause wherein the respondents were plaintiffs and the appellants were defendants. The substantial question for decision in the case was whether the paved footway of disused roads in an urban district form part of the "main road" within the meaning of the Highways and Locomotives (Amendment) Act, 1878. The respondents are an urban sanitary authority, and they raised the point whether they were entitled to recover from the appellants, the County Council, the sum of £264 18s. 8d., awarded by the Local Government Board as due in respect of the losses incurred by the respondents during two years ended in March, 1892, which had been expended by them exclusively in the maintenance and repair of the paved footpath at the side of the main road and not upon the carriage-way. Mr. Justice Wright gave judgment for the respondents for the amount claimed, stating that he was bound by the authority of the decision of a Divisional Court in the Local Board of Warminster, Wilts, and the Court of Appeal affirmed his decision. Their lordships, without calling upon the respondents, gave judgment affirming the decision of the Court below and dismissing the appeal with costs. Lord Herschell said that the question involved the meaning of the words "main roads." Under the 13th section of the Act of 1878, he came to the conclusion that the paths on each side of a main road were part of the road. The appeal must be dismissed with costs. The other lords having concurred, the appeal was dismissed with costs.

**BUILDING BY-LAWS NOT RETROSPECTIVE.**—**WITCHINGTON COUNCIL V. MOORE.**—In this case, which came before the Court a few days ago, Vice-Chancellor Hall gave judgment on April 26. The Withington Urban District Council asked for an injunction to restrain Mr. George Moore, builder, from building certain houses, the plans of which, it was contended by the council, had been abrogated by the adoption of more modern bye-laws. The defendants submitted that his plans having been approved he had acquired the right to build, particularly as the houses in question formed part of a scheme already begun. The Vice-Chancellor remarked that the defendant's contention was that he had in effect commenced work, that the houses he intended to build were part of a scheme which was partly completed, and that he was entitled to go on with the work. Moreover, the defendant said that if the plaintiffs' contention was right, all the houses they had allowed him to build since July, 1893, were erected in contravention of the by-laws, and that therefore the council would be entitled to pull them down. He therefore claimed in defence that he was entitled to the protection of the by-laws under which he had received approval of his plans. Now it was quite clear to the Vice-Chancellor that the by-laws were not intended to be retrospective. Moreover, they contained a clause to the effect that they did not affect "any work commenced before the date of these by-laws." The supposition, therefore, that the Court could give a right to pull down the houses was preposterous. In his view, the new by-laws did not apply to buildings previously sanctioned, and as he considered the houses in question part of one scheme, he should decline to allow the new by-laws to apply to them. Judgment would therefore be given for the defendant, with costs.

**PERMISSIBLE ADVERTISEMENTS.**—In the Chancery Division of the High Court, before Mr. Justice Romer, on Friday, an action was tried, "Our Boys Clothing Company, Limited v. Holborn Viaduct Land Company, Limited." The plaintiffs have premises in Holborn, leased from the defendant company, and last summer they put up across the front of their premises a large advertisement announcing "an eccentric and startling stock-taking sale." The defendants objected to this advertisement, which they alleged to be an infringement of a covenant in the lease that the lessee "will not do anything which may grow to the injury, annoyance, disturbance, or inconvenience of the lessors," and eventually they caused it to be pulled down. The plaintiffs thereupon instituted an action to restrain the defendants from removing or interfering with any of their advertisements or trade announcements. The defendants counter-claimed for an injunction to restrain the plaintiffs from exhibiting advertisements so as to be an annoyance to them and their other tenants. His Lordship held that

what the plaintiffs did was not a breach of their covenant, and gave judgment to that effect, with costs to the plaintiffs.

**BY-LAWS AS TO NEW STREETS.**—**DISTRICT COUNCIL OF BARTON REGIS V. STEVENS AND ANOTHER.**—Mr. Baron Pollock and Mr. Justice Kennedy heard, on Monday, a special case stated by consent in an action brought by the plaintiffs for an injunction to restrain the defendants from laying-out and constructing a certain new street and certain sewers within the district of the plaintiffs. The defendants are the executors and trustees of the late Sir Joseph Dodge Weston, who was, at the time of his death, the owner of land at Westbury-upon-Trym, Gloucestershire. The plaintiffs are the rural sanitary authority for the district, having, however, urban powers. The defendants' testator, being desirous of developing the land by building thereon, deposited a plan for a new street with the clerk to the authority. The proposed new street (Rosebery-avenue) abuts upon an existing thoroughfare within the city of Bristol, and outside the plaintiffs' district. That thoroughfare is 30ft. wide throughout its length. The proposed new street abuts at the other end upon inclosed ground. The deposited plan was disapproved. The plan was amended, and on Jan. 26, 1894, again disapproved of. The defendants' testator continued, however, to lay out Rosebery-avenue, and to construct the sewer therein, and so as to empty into a single cesspool. The authority object now to approve of the said plans on two grounds. First, that a proper entrance to Rosebery-avenue was not provided at one end thereof; and secondly, that the system of drainage provides for drainage into one cesspool only. Mr. Lawrence, for plaintiffs, cited "Hendon Local Board v. Pounce" and "Bromley Local Board v. Lloyd." Mr. Low urged that they were the decisions of single judges, and that a divisional court was not bound by them. He cited further proceedings in "Bromley Local Board v. Lloyd." Mr. Baron Pollock said that the Court ought to give effect to the judgments given by Mr. Justice North in the case of "Hendon Local Board v. Pounce," and by Mr. Justice Kekewich in the case that followed it. As at present advised, the learned Baron was of opinion that those decisions were right. Mr. Justice Kennedy concurred.

## CHIPS.

The urban district council of Llanfairfechan have decided to purchase the local waterworks, at a cost of £9,500.

The annual meeting of the Kent Archaeological Society will be held, on July 28 and 29, at Sittingbourne, and not, as was announced last week, at Canterbury. That place, however, is this year to be the venue of the annual week's congress of the Royal Archaeological Institute.

Recognising the enlargement of the area of his jurisdiction, owing to the extension of Liverpool, and the ability which he displays in the post of city engineer, the health committee of that city have unanimously decided to recommend the council to increase the salary of Mr. H. Percy Boulnois from £1,000 to £1,200 a year.

The Yost Typewriters' Co., Ltd., have found it necessary to open an additional branch at 50, Dean-street, Newcastle-on-Tyne, the business in that district having developed to such an extent that it was impossible for their late agents to adequately cope with it. A large supply of typewriters and accessories will be kept in stock.

Under the presidency of Mr. J. Wolfe Barry, C.E., the annual dinner of the London Association of Foremen Engineers and Draughtsmen was held on Saturday evening at the Cannon-street Hotel, a large company assembling on the occasion. The toast of the evening, "Prosperity to the Association," was acknowledged by Mr. Royal, the president.

The statue to be erected on the Castle-hill at Dunoon, in honour of Burns's Highland Mary, will be unveiled during July by the Marchioness of Lorne. Mr. D. W. Stevenson, R.S.A., of Edinburgh, is the sculptor.

A redos of oak, having as its central subject "The Last Supper," has just been placed in Baslow Church. Mr. Tory, of Sheffield, was the sculptor.

The joint committee of the East and West Suffolk County Council met last week to consider a report by Messrs. Giles, Gough, and Trollope on the improvements and extensions needed at the lunatic asylum at Melton, near Woodbridge. The architects recommended sundry works, including a new block for 120 female patients, and another for 100 male patients, the total cost being estimated at about £43,500, exclusive of the purchase of 33½ acres additional land. It was referred to a committee to consider and report whether the asylum should be enlarged, or a new building erected for West Suffolk.

Mr. A. Pearce has been appointed as municipal assistant engineer, Calcutta waterworks, in place of the late Mr. Dickson.



## WATER SUPPLY AND SANITARY MATTERS.

**FALCON COURT, S.E.**—The London County Council, in pursuance of a scheme for the improvement of an insanitary district of Southwark, propose to sweep away no less than 111 houses in Falcon-court and adjoining courts and alleys. Dr. F. J. Waldo, medical officer of health of the district, stated in evidence before the Local Government Board inspector that the Falcon-court area is hemmed in on the west by lofty model dwellings, on the east by houses lining the Borough High-street, and on the north and south by warehouses, preventing the admission of light and air. The cellars, especially in the back-to-back houses, contain the water-closets, ash-pails, and other sanitary conveniences. They also serve as kitchens, and are generally used for the washing and drying of clothes. The occupied houses cover together 1 acre, 30 poles, and upon that space 822 human beings are concentrated.

**SOUTHAMPTON.**—The mayor laid last week the foundation-stone of the engine-house in course of erection in connection with the extension of the existing refuse destructor, and the development of the scheme for the re-drainage and disposal of the sewage of the eastern districts of the borough by chemical precipitation before discharging into the river Itchen. The eastern districts now being dealt with have an area of 54½ acres, and a population of 45,000 persons. The volume of sewage in dry weather is 1,350,000 gallons, increasing in wet weather by rainfall to 3,000,000 gallons. Tanks are to be constructed to receive the sewage for treatment, and they are to be kept up to a level to permit the discharge of the effluent on the ebb tide. For this purpose a pump well will be erected at the wharf, and also an engine-house, containing engines and pumps for lifting the sewage into the tanks. In connection with the pump-wells are two chambers, in which the sewage will be screened before passing to the pumps' suction. It will then be lifted and discharged into the mixing culvert, where the chemicals will be added. Rapid mixers will be provided to insure the thorough incorporation of the chemicals with the sewage before it proceeds to the tanks, where it will remain quiescent until a satisfactory effluent has been obtained. Messrs. Jenkins and Sons, of Bournemouth, are the contractors for the engine-house, pump-wells, screening chambers, and chemical stores. The refuse destructor, built ten years ago, is being enlarged by the addition of four cells, two new boilers of the water-tube type being inserted between each pair of cells. The destructor is being erected under contract by Messrs. Goddard, Massey, and Warner, of Nottingham. Buildings are provided for the sludge presses, air-compressing plant, lime stores, &c., the tender of Messrs. Jenkins and Sons, of Bournemouth, for the erection of which has been accepted by the corporation. The existing main sewers, which are situated at low levels with flat gradients, after the house drainage has been disconnected from them, will be retained for the purpose of rainfall drainage only, so as to prevent the flooding of low-lying portions of the borough. In addition to this, about 8,000 yards of stoneware pipe rainfall drains will be laid in the districts of Newtown, Nichols-town, Bellevue, Terminus-terrace, Oxford-street, Marsh Estate, and Northam districts. The whole of the works described are estimated to cost £40,000. A new cast-iron intercepting sewer is being constructed from the platform along the town quay to the bottom of Simnel-street, where it will form a junction with a cast-iron intercepting sewer laid several years ago along the western shore to Blechynden, including a system of storm-water drainage for the diversion of the rainfall from the sewer stated, and the precipitating tanks at the platforms. This work has recently been let to Messrs. Sanders and Co., of Bournemouth for £4,000.

A new district church is to be built at Gilfach in the parish of Llantrisant, Glam., from plans by Mr. E. M. Bruce Vaughan, of Cardiff.

In consequence of the application of the Herts County Council for power to borrow £150,750 for erecting and furnishing a new asylum at Hill End, near St. Alban's, £6,000 for the erection of police-stations at Rickmansworth, Watford New Town, Much Hadham, and Harpenden, and for permission to sell land at Hill End to the Great Northern Railway Company, for the construction of a siding, one of the Inspectors of the Local Government Board, Colonel J. O. Hasted, R.E., held a public inquiry at the Shire Hall, Hertford, on Friday. The clerk to the County Council (Mr. C. E. Lougmore) appeared in support of the applications. It was explained that the asylum will be built from the designs of Mr. Hine, of Parliament-street, S.W., and is intended to provide for the eventual accommodation of 800 patients, with accommodation for 564 patients at once. The administrative block for the whole 800 would be at once erected. The police-stations will be planned by Mr. Urban A. Smith, the county surveyor of Herts, who explained the designs.

## STAINED GLASS.

**STRATFORD-ON-AVON.**—At the birthday celebrations at Stratford-on-Avon on St. George's Day, the chief feature was the unveiling of the American memorial window in Holy Trinity Church by the Hon. T. F. Bayard, the U.S. Ambassador, and the presentation to the Shakespeare Memorial Theatre of a portrait of Edwin Booth. The new stained-glass window lights the south transept, a portion of the church erected in the 14th century by John de Stratford, Archbishop of Canterbury. The leading idea is the Incarnation, the subject the Adoration by the Old World and the New. Christ is shown in the centre light in His mother's arms, and beneath is a representation of the Epiphany. In the side-light to the east are shown figures representing the Mother Country and the Mother Church, St. Edwin, Bishop of Worcester in 716, representing ecclesiastical authority; King Charles I. representing civil authority; and Archbishop Laud, who was the first to propose the sending of a bishop to America. Beneath these is a small representation of Laud's martyrdom, of which the 250th anniversary was observed last year. In the side-light to the west are the figures of three of the foremost founders of the New World—Amerigo Vespucci, Christopher Columbus, and William Penn. Beneath these is a representation of the Landing of the Pilgrim Fathers, their chaplain being shown in the act of prayer, standing on Plymouth Rock. When the whole design is complete, John de Stratford will be shown building the south aisle of Stratford Church, and Bishop Seabury receiving consecration at the hands of the Scottish bishops at Aberdeen. The window is the work of Messrs. Heaton and Butler, of London, and the portrait is a replica of the one by Mr. J. S. Sargent, A.R.A., which hangs in the hall of the Players' Clubhouse, and depicts the American tragedian in the character of Hamlet.

## CHIPS.

The school board for Scarborough accepted on Friday tenders amounting to £1,888 for the enlargement of the school in Gladstone-road by six classrooms, accommodating 340 children.

A portrait of Sir Robert Pullar, of Tayside, painted for subscribers by Sir John E. Millais, P.R.A., was formally presented to the new Picture Gallery at Perth on Saturday night.

From a return of the County of London valuation in force on April 6, 1896, which has been submitted by the local government taxation committee of the London County Council, it appears that the total valuation of the Administrative County of London is £35,833,468, an increase of £1,611,639, or nearly 5 per cent. on the valuation of 1895. Of this sum £264,000 represents the increased valuation of the City, an increase of rather more than 6 per cent. on last year's valuation.

The old oak carved work of the stalls formerly in Peterborough Cathedral, was purchased at the recent restoration of the choir of that minster for the Dominican Priory at Red Burns, Newcastle-on-Tyne. It has been made up into a recondes for the priory church, and was dedicated on Sunday.

The city fever hospital in Netherfield-road, North Liverpool, is being extended by the addition of two pavilions and an isolated ward. At present there is accommodation for 90 patients, and the additions now being made will find room for 50 more beds, bringing the total to 140. A porter's lodge is also being built. The cost of the whole work, including land, buildings, and boundary walls, is estimated at £26,000. Messrs. Morrison and Sons, of Wavertree, are the contractors.

On Monday last St. Mark's new schools, erected at the corner of Brickkiln-street and Humber-road, Wolverhampton, were dedicated by the Bishop of Lichfield, and formally opened. They provide accommodation for 306 children on the ground floor, and 266 on the first floor. They are built of red brick, with tiled roof. The architect was Mr. J. Lavender, and the builder Mr. H. Gough. The cost of the site, building, and furnishing is about £2,600.

A new Wesleyan chapel at Guiseley was opened last week. It is Gothic in style, and has a tower and spire rising to a height of 100ft. Externally, delphic stone wallstones have been used, relieved by ashlar dressings of Guiseley sandstone, and the roof is covered with green Westmoreland slates and red ridge tiles. Internally, the church comprises nave, chancel, and transepts, and in each of the latter a small gallery is placed. The accommodation is for 500 persons on the ground floor, and 200 in the galleries. Four vestries and a store-room are also provided. All the woodwork is pitch-pine, and every window has some tracery heads, and is filled with stained glass. Messrs. Walker and Collinson, of Bradford, are the architects, and the chief contracts have been carried out by the following firms:—Messrs. S. Mounsey and Sons, masons, Guiseley; and Mr. James Deacon, joiner, Shipley. The cost, including site, amounts to over £5,000.

## Our Office Table.

Steps are being taken, under the auspices of the National Trust for Places of Historic Interest and Beauty, to secure for the nation the house and art treasures of the late Lord Leighton, which are announced for sale by auction at the Mart, E.C., on Tuesday, the 19th inst. At a meeting held at 4, Melbury-road, W., on Wednesday, letters of sympathy with the movement and communications were read from many eminent men in the world of art and letters, including Professor H. Herkomer, R.A., Mr. W. B. Richmond, R.A., Professor Villiers Stanford, Lord Thring, Lord Napier of Magdala, Mr. Walter Crane, A.R.W.S., and Sir Alfred Lyall. After a discussion, in which Lord Loch, Mr. Alfred Waterhouse, R.A., Mr. Aitchison, A.R.A., Mr. Hamo Thornycroft, R.A., and others took part, it was resolved that steps should be taken towards forming a provisional committee, with a view to a special meeting to be called at the late Lord Leighton's house at an early date, to take further steps in support of the movement. Mr. H. D. Rawnsley, the hon. secretary of the National Trust, writes:—“It is impossible to overrate the value to art students in the future of being able to consult in such surroundings the studies and careful drawings for pictures, of which whole portfolios-full exist. The walls are covered with sketches of the artist's travels, and are a kind of journal of his life. For these alone, putting aside the marvellous Arab hall and the pictures by Tintoret, Sir Joshua Reynolds, Constable, Corot, Mason, Alma-Tadema, Millais, Burne-Jones, and Watts, it would seem that the house should, if possible, be retained in its entirety. No monument of a man's mind could so fitly enshrine his memory as this house.”

The London County Council discussed, on Tuesday, a report showing that the expenditure by the Works Committee upon works carried out for the Fire Brigade Committee had largely exceeded the estimates. The report set out in Table 1, 24 accounts of work done by the Works Department at fire brigade stations, showing that the architect's original estimate was £970, revised estimate £1,256, and the actual cost £1,825. Table 2 gave five accounts, for which the original estimate was £586, the revised estimate £1,033, and the actual cost £1,522. Table 3 contained 17 accounts, for which the architect's original estimate was £2,589, his revised estimate £3,348, and the actual cost £5,101. One of the items in this table was for alterations and painting at the Bishopsgate Fire Station, the original estimate being £500, the revised estimate £883, and the actual cost £1,332. The excess of expenditure over estimate for the year 1893-4 on repairs at stations was about £3,200, and for the year 1894-5 it was £5,668. The Committee recommended that the instruction given to the Fire Brigade Committee, that jobbing work should from time to time be done by the Works Department, should be revoked. An amendment referring back the report with instructions to the committee to report again after 12 months' experience of the present system of executing jobbing works, was ultimately carried; but a further recommendation of the committee that they should have the option of intrusting jobbing work to the Works Department or to contractors was carried.

The London County Council will be asked by the Improvements Committee next Tuesday to sanction the expenditure of £30,000 towards the cost of widening the south side of West Strand, from Nos. 76 to 88, which form the Strand frontage to the new Hotel Cecil. The United Realisation Company, the owners of the hotel, are now promoting a Bill in Parliament by which they seek compulsory powers to acquire the property between the Strand and the hotel, and they have made the following proposals to the Council:—(a) That the company shall give up sufficient land to make the Strand 80ft. wide between Nos. 76 and 88 inclusive; (b) that the company shall have the right to construct cellars under the street pavement in such a way as will meet with the approval of the local authorities; (c) that the company shall be at liberty to build along the whole frontage of the widened road, including the sites of Salisbury-street and Cecil-street, and to make an access to the courtyard of the hotel by means of a private gateway through the building on the Strand level; (d) that the Council shall pay to the company the sum of £30,000 and shall agree to support the



company's Bill in Parliament. These proposals, which the committee consider reasonable, mean that a strip of land, about 16ft. in depth and containing an area of about 1,945sq. ft., would be given up and added to the public highway, provided the Council agreed to pay £30,000 for an additional strip, 15ft. in depth, thus making the Strand 80ft. wide, by adding to the public way land of a total area of about 5,080sq. ft., and having a length of frontage of 225ft. The committee think that this very favourable opportunity for widening the Strand at a comparatively small cost should be readily seized, and they recommend the Council to accept the proposal of the company.

The discoveries and results of the past year's explorations in the Romano-British city of Silchester have been on view during the present week at the Society of Antiquaries, now in Burlington House. The area of the site—about 100 acres—is, for exploration purposes—divided into a number of equal squares or insulae, and in the insula XIV., near the west gate of the city, two unusually large residences have been exhumed from the foundation to the height of the dado of the principal rooms. The two houses are situated between the main street running west and east from the western gate, and another road parallel with it on the south, the entrances to both being from the south street, and not from the main street, towards which are the stables and other outhouses. The westerly house, which occupies an area of 150ft., is being built completely round a central court instead of on three sides of it, or with, as in some cases, a wall on the fourth side. On the sides of the central open-air court are two wings with the principal rooms placed between an outer and an inner corridor—the grand entrance and vestibules being central on the south front, and the rear on the north being closed by two large rooms within corridors as at the sides of the edifice. The inner court is also divided from the vestibules by a corridor. In the five principal rooms of the eastern wing were as many tessellated pavements, three of which, each 20ft. square, have been wholly removed and put together again in sections—the half of each pavement being as much as can be displayed in the society's large hall. These are now on view with the rest of this year's collection. The second or easternmost mansion is 160ft. in length, but broader at the north than at the south end, the breadth averaging about 100ft. This villa is two stories in height, the principal rooms being on the west from about the mid-length to the south extremity, a tessellated gallery passing at the north across to a central block of rooms on the east side. The court is large, and in the southern area, there being a gate in the eastern wall. In the south-east angle of the area is the entrance to the residence, all the ground-floor rooms being accessible by a corridor, in the course of which are traces of two stairs, which gave access to the upper rooms. There is also on the ground floor, entered from the corridor, an interior temple for domestic worship, and a square altar for the household gods. This residence had, like the western house, an outer court on the north, with a wide gate leading into the main street. The two houses together occupy the whole of one insula. In the western house was found a Roman force-pump, with its four lead pipes, their valves, and a central cistern in a large piece of timber.

During the past week Dr. John Murray and Mr. F. P. Pullar have taken over 350 soundings in Loch Lubnag, and with these data have been able to draw out the contour lines of depth throughout the whole extent of the loch. The bottom is very uneven, due apparently to the presence of glacial moraines. The loch is divided into three well-marked basins. In the northern basin, which extends for about a mile and a half from the head of the loch, the greatest depth is 52ft. The central basin, which is about three-quarters of a mile in length, is the deepest, the greatest depth being 153ft. This central basin is separated from the northern one by a flat submerged ridge, on which the depth is 10ft., and from the southern basin by a ridge on which the depth is 31ft. The southern basin occupies the whole southern portion of the loch, which has a direct north and south trend, and the greatest depth in this southern basin is 117ft. At present the loch is believed to be about 3ft. higher than its lowest summer level, and 6ft. lower than its highest winter level. These soundings were taken by means of Dr. Youll's wire sounding apparatus, and it is proposed to extend those observations to other Scottish fresh-water lochs.

THE annual dinner of the Sheffield Master Builders' Association was held on Thursday night in last week at the King's Arms Hotel, Commercial-street, in that city. Mr. James Longden, the president, was in the chair. After the loyal toasts had been honoured, Mr. C. Coward gave "The City and Trade of Sheffield." He remarked that the present condition of the building trade was highly satisfactory, and the future was promising. Mr. J. Brumby proposed "The Corporation," and commended the business done, with one exception, his idea being that much of the work might be done more economically by contract than by the present system. Mr. George Carr responded. "Success to the Master Builders' Association" was given by Mr. M. Biggin, who advocated a uniform rate of charges for day-work, the federation of all sections of the building trade, the adoption of the London agreement, whereby there is an arbitration clause in all contracts, and the careful pricing out of quantities. The secretary, Mr. John Spink, also spoke to the toast, and urged those outside to join, so that there might be united action for the general good. Other toasts followed.

In our notice last week of the Building Trades Exhibition, Manchester, we overlooked the exhibit of the Lancashire and Cheshire Opalite Glazed Brick and Tile Co., Ltd., who exhibit several samples of their patent opalite glazed bricks and tiling, which are superseding the ordinary bricks for wall decoration and general application, being more durable, less costly, and capable of producing a varied combination of colours for decorative purposes. The Manchester agents are Messrs. Thos. Elliott and Sons, 37, John Dalton-street.

The London Extension of the Manchester, Sheffield, and Lincolnshire Railway Company Bill, which is of an omnibus character, and proposes, at £350 an acre, the purchase of an estate of 120 acres at Neasden for siding purposes and the construction of a goods' depot, came before a select committee of the House of Commons on Tuesday. The committee found the preamble proved subject to modification of clauses.

The St. Helen's Corporation have applied to the Local Government Board for sanction to borrow £9,350 for public works and improvements, including £2,600 for laying new water mains, £2,000 for gas mains extension, £1,500 for works of sewerage and sewage disposal, £1,050 for public abattoirs, and £850 for street improvements. An inspector of the Local Government Board will hold an inquiry into the matters concerned on Thursday in next week.

The baths committee of the Leeds Corporation, at a meeting held yesterday, have resolved to advertise for tenders for the erection of public baths at Holbeck. The baths, the architectural features and internal arrangements of which will be similar to those at Kirkstall-road and Union-street, are estimated to cost about £8,000. A site has been secured at the corner of Holbeck-lane and Springwell-road.

New schools, erected in High-street, Tunstall, by the Wolstanton School Board, were formally opened on Monday. The schools have been provided at a cost of £6,900 for the buildings and £2,500 for the site. The buildings are two stories high, and afford accommodation on the ground floor for 330 infants, and on the upper floor for 460 boys and girls, the latter being used for the present as a mixed department. The contractors for the buildings were Messrs. Yorke and Goodwin, of Tunstall, and the architect was Mr. A. R. Wood, of Tunstall.

At Tiverton County-court, on Saturday, the award of Mr. C. E. Ware, of Exeter, was read on the case of Edmund Labdon, builder, of Collumpton, who, at the previous court, claimed £59 16s. of Valentine Frederick Wreford, farmer, of Culmstock, balance due for building a house. A counter claim for £19 3s. structural defects, £5 inconvenience sustained, £5 trespass was referred to Mr. Ware, who awarded defendant £13 11s. for the defects, and nothing for the other items, the costs to be shared equally.

M. Ferdinand Duval, who was for many years Prefect of the Seine, under the Presidency of M. Thiers and Marshal MacMahon, died on Sunday, of influenza, at the age of 69. During his term of office as Prefect of Paris he carried out the improvements designed by Baron Haussmann, and especially the Boulevard St. Germain and the Avenue de l'Opéra.

The annual soirée of the Architectural Association will take place on Friday, May 15th, at St. Martin's Town Hall, Charing Cross-road, W.C., when a new and original comic opera, entitled "The Celestial Institute," written by Mr. E. Howley Sim, will be produced. The music has been specially composed by Mr. Leonard Butler.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Annual Meeting. 8 p.m.  
Society of Engineers. 7.30 p.m.  
Society of Arts. "Applied Electro-Chemistry," Cantor Lecture No. 2, by Jas. Swinburne. 8 p.m.  
Liverpool Architectural Society. Annual Meeting.  
TUESDAY.—Society of Arts. "Australia's Prospects in British Markets," by Jas. F. Dowling. 8 p.m.  
Institution of Civil Engineers. "American and English Steel Plates," by Jeremiah Head; "American Rolling Mills," by S. T. Wellman. 8 p.m.  
Glasgow Architectural Association. Lecture on "The Distinctive Qualities of Scottish Architecture." 8 p.m.  
WEDNESDAY.—Royal Archaeological Institute. "Discoveries of Mural Paintings in Willingham Church, Cambs.," by C. E. Keyser, F.S.A.; and "Great Stones at Gozo, Malta," by Dr. A. A. Caruana. 4 p.m.  
Society of Arts. "High Explosives and Smokeless Powders," by Hudson Maxim. 8 p.m.  
Carpenters' Hall Free Lectures. "The Setting-Out and Construction of Staircases," by James Bartlett, demonstrator at King's College Architectural Classes. 8 p.m.  
Edinburgh Architectural Association. Annual Meeting. Valedictory Address by R. Rowand Anderson, LL.D., President.  
FRIDAY.—Architectural Association. "Fabrics," by Aldam Heaton. 7.30 p.m.

## CHIPS.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied some more of their patent Manchester stoves with descending smoke flues to the Waktipu District Hospital, Dunedin, New Zealand, those previously supplied having proved very satisfactory.

The committee of the Blind Asylum and School at Edinburgh have adopted remodelled plans and estimates by Mr. G. Washington Browne, R.S.A., of that city, for additions and alterations to the premises. The proposed outlay is about £4,500.

The Ontario Architects' Registration Amendment Act, to which we referred on p. 586 in our issue of a fortnight since, has been withdrawn by the promoters, as it is understood that the Government of the province will deal with the question.

The Bishop of Winchester dedicated on Friday Shere parish church, which has lately undergone restoration.

The Lord Mayor presided on Friday at the Mansion House over a meeting in support of the East London Trades Exhibition, which is to be opened by the Prince of Wales at the People's Palace on the 6th of June. Among those who took part in the proceedings were the Bishop of Stepney, Cardinal Vaughan, the Chief Rabbi, Sir A. Rolitt, M.P., and the Master of the Drapers' Company.

New works of water-supply at St. Austell, Cornwall, were inaugurated on Thursday in last week. The work of constructing a reservoir with a capacity of 800,000 gallons and two filter-beds, each with a capacity of 100,000 gallons, has been carried out for the urban district council by Messrs. A. Delbridge and Sons.

Mr. William F. Yeames, R.A., has been appointed Curator of the Painted Hall of the Royal Hospital, Greenwich.

The old parish church of Colne, in Huntingdonshire, has been reduced to a condition of ruin by the falling of the tower on Friday. Only the bare walls and a part of the chancel remain. The church dated from the 14th century, and a fund was in existence for its restoration.

The old organ in St. Michael's Church, Framlingham, built in 1674 by Thamar, of Peterborough, and the only known work of his extant, was, after repairs and additions, reopened on Easter Sunday. The organ was originally built for Pembroke College chapel, and was presented, in 1708, by the Master and Fellows, to St. Michael's.

An inquiry was conducted by an inspector of the Local Government Board on Tuesday into the application of the Blackpool Corporation for permission to borrow a sum of £30,000 for electric-lighting purposes. It was stated by the electrical engineer that a further extension of the works was urgently needed.

The Unopposed Bill Committee of the House of Commons passed on Wednesday a Bill sanctioning an extension of the authorised Baker-street and Waterloo Electric Railway, in order to effect a communication with the terminal station of the Manchester, Sheffield, and Lincolnshire Railway Company's new line into London. The Bill also authorises the construction of this railway in three separate sections, each section having a distinct capital. An extension of time is also granted until March, 1901, within which to construct this railway.



## Trade News.

### WAGES MOVEMENTS.

THE CRISIS IN THE LONDON BUILDING TRADES.—We regret to find that affairs in the building trades of London have come to a crisis owing to the refusal of the Master Builders' Association to arrange a conference with the Building Trade Federation, and yesterday afternoon at 4 p.m. the men in all trades, with the exception of the bricklayers, tendered the customary one's hour's notice to cease work, and thus formally began a strike. A conference of the labourers' unions was held on Wednesday, after which the following notice was issued:—"Building Trades Crisis.—Labourers' final instructions are to give one hour's notice to terminate their engagements to-day, Thursday, at 4 p.m., with the exception of those employed direct for public bodies, and any employers who concede the terms demanded. A. Humphrey, Navvies' Union; T. Coffey, General Labourers' Union; J. Davenport, United Order of General Labourers; W. Thorne, Gasworkers; D. Stevenson, United Builders' Labourers, Secretary, Federated Labourers' Council." The members of the Plasterers' Union have received similar instructions. The London Building Trades' Federation issued the following notice to all the secretaries of the branches of unions engaged in the building trade in the United Kingdom:—"London Crisis. Dear Sir,—Seeing we are expecting a serious dispute in the London district, we would deem it a favour for you to make this known to your members, so that they may not be induced into accepting employment for this district, either by advertisement or otherwise. Thanking you in anticipation.—Yours fraternally, The Executive Council, J. Verdon, Secretary."

CASTLETOWN, ISLE OF MAN.—A strike of stone-masons, joiners, plumbers, and wallers is pending at Castletown. The wages in these trades are 24s. per week of 57 hours, finishing at three o'clock on Saturday. The men ask that the hours should be reduced to 54, and that the work on Saturdays should close at noon. The masters refuse to accept the men's terms, and declare that in the matter of wages and hours the men are as well off as at similarly-situated places in the island. The men contend that they should be conceded the same hours as prevail at Douglas, and announce that if their terms are not accepted by to-morrow (Saturday) they will strike.

DUBLIN.—The plasterers, brick and stone layers, carpenters, painters, slaters, and builders' labourers of Dublin came out on strike last (Thursday) night, owing to wages disputes.

DUNDEE.—The threatened strike among the operative house-painters for an increase of wages from 7½d. to 8d. per hour has been averted, the men having decided not to come out.

HUNTLEY, N.B.—The carpenters came out on strike on Monday. The points of difference have reference to the indenture of apprentices, the men contending for five years' service instead of four, and that fortnightly payments should be made before one o'clock on Saturday.

LEEDS.—A conference took place on Saturday night at the Hope and Anchor Inn, Call-lane, Leeds, between the representatives of the London and Manchester societies of operative bricklayers and the local branch of the Bricklayers' Labourers' Union, in reference to the dispute now pending between the men and the master builders of Leeds. The delegates, who met together after the separate meetings, were unable, however, to decide upon any definite action being taken at present. Some of those who attended took occasion to reply to recent statements that Sheffield was the only town in Yorkshire where 9d. an hour was paid to bricklayers. It was pointed out that 9½d. was paid in the Manchester district, and also in the London district, which comprised 52 branches, while in Blyth 9½d. was likewise paid. Among the towns where 9d. was paid were Birmingham, Birkenhead, Blackhill, Blackburn, Byker, Bolton, Edinburgh, Gateshead, Hartlepool, Horwich, Jarrow, Liverpool and district, Liscard, Middleton, Newcastle-on-Tyne, Oldham, Rochdale, Rotherham, South Shields, North Shields, St. Mary's Cray, Sunderland, Stalybridge, Sutton Coldfield, and Whitefield.

NEWCASTLE-ON-TYNE.—The lock-out of the bricklayers and plasterers by the Master Builders' Association of Newcastle, Gateshead, and district has now been settled so far as the bricklayers are concerned. The two classes of workmen quarrelled as to which trade should do new cement work, and as they could not agree and stopped work at several buildings, the employers decided that the question must be left an open one for them to settle, and locked out both bodies of workmen. The bricklayers are willing to leave the matter in the hands of the masters, and resumed work on Monday; but the plasterers still hold out, abiding by the late arbitration which gave them the work, or are willing to

submit to the decision of a court of arbitration consisting of three architects, as originally proposed by the employers. The plasterers are also demanding an advance of ¼d. per hour in their wages, and are out on strike for the advance.

PORTSMOUTH.—A strike is threatened in the building trade at Portsmouth.

SUNDERLAND.—The strike of Sunderland house joiners has been settled, the men having temporarily decided to accept the masters' offer at 9d. per hour, the question as to the winter work being left over for three months, when the matter of revising the rules will also receive attention.

### CHIPS.

The foundation and corner stones of the new synagogue at Cardiff were laid on Wednesday. The new synagogue will occupy a site in Cathedral-road, secured from the Marquis of Bute, and will accommodate 241 persons on the ground floor and 158 in the gallery. Provision has also been made for considerable extension. A feature of the plan is the arrangement whereby the apse containing the Ark will be placed at the same end of the building as the entrance, this being the only method of securing an eastward aspect of the Ark. The reading-desk and the pulpit will be grouped at the same end of the building as the Ark. The new synagogue has been designed by Mr. Delissa Joseph, F.R.I.B.A., of London, and the contract for the building is £5,161.

The Romilly-road Schools, Barry, Glam., were opened on Monday week. The schools are built of terracotta bricks, and are situated on the hill above Barry. The buildings comprise cookery kitchen, scullery, larder, and caretakers' dwelling-house, and have been erected at a cost of £5,395, by Mr. Geo. Rutter, from plans prepared by Mr. George Thomas, F.S.I., Cardiff.

The ancient stained-glass windows in the parish church of St. Dennis, at York, have just been repaired and renovated by Mr. J. W. Knowles, of Stongate, in that city.

The claim for compensation brought by Mr. Cecil Harris and others against the Manchester, Sheffield, and Lincolnshire Railway in respect of the compulsory acquisition of 36 acres 1 rood and 3 poles of the Westcote's Estate, Leicester, has been brought to a close by the issue of the arbitrator's award at £45,347, in addition to £490 for certain drainage alterations.

A stained-glass window, from designs by Sir E. Burne-Jones, has lately been placed at the east end of Rickmansworth parish church. The church itself was rebuilt six years ago, the architect being Sir A. Blomfield. The east window is erected in memory of the late Lord and Lady Ebury. The subject is the Crucifixion. A reredos, of Messrs. Powell's opus sectile, has also lately been erected in memory of the late Lord and Lady Ebury by friends. About £2,000 more is wanted to complete the church, in addition to the £7,000 or so spent upon it already. The tower is all that remains of the original edifice, which was pulled down in 1825 to make way for the structure which was in its turn rebuilt in 1890.

At the morning service at St. Lawrence's Church, York, on Sunday, the Dean dedicated the carving work which has been completed in the nave, and in the afternoon the Rev. Canon Machell dedicated a window in the north transept, placed there by the children of the parish. The figures at the terminations of the nave arches represent St. Lawrence and St. Nicholas, vested as deacon and bishop; St. Elizabeth, with St. John the Baptist by her side; St. Anne, St. Peter, St. Agnes, and St. John the Evangelist. There are figures of angels bearing shields inscribed with the arms and initials of the donors, and the nave pillars—the capitals of which are ornamented in the Early English and the Early Decorated styles alternately—the corbels, and the roof capitals, together with the two western responds, having been treated by the sculptor, Mr. Milburn, of Bootham Bar. The window has three lancet openings, and the subject is "The Finding of the Saviour in the Temple."

The chairman of the Market and Parks Committee of the Nelson Corporation, formally opened on Monday for public use a portion of land embracing about 5,000 square yards, acquired by the Nelson Corporation as an extension of the existing park.

Lightburn infectious diseases hospital, which has been erected by the joint-committee of the lower and middle ward districts of the county of Lanark, the first hospital of the kind built at the expense of a county council, was formally opened on Friday. The hospital has been erected at a cost of £29,000, and provides accommodation for 60 patients. It consists of eleven blocks of buildings. These include two pavilions, each containing 17 beds; two smaller pavilions, each containing 11 beds; a couple of observation wards, and the administrative department, where the hospital physician, 14 nurses, and 10 servants will be accommodated. Mr. James Thomson, of Edinburgh, is the architect.

The arbitrator in the case of George Killpatrick v. the Sheerness Urban District Council has awarded the plaintiff £55 2s., the costs to be jointly borne by both parties.

Building operations are in active operation at Aberdeen, for at the last meeting of the town council the erection of new dwelling-houses and buildings of the estimated value of £40,000 was sanctioned.

The tender of Messrs. Walter Scott and Co., of Newcastle-on-Tyne, has been accepted for the construction of one of the sections of the Central London Railway.

The church of St. Clement, Chorlton-cum-Hardy, was consecrated on Friday by the Bishop of Manchester. It is described as "St. Clement's New Church," but as a matter of fact it has been open and in use for some thirty-six years. Some additions have recently been made, at a cost of £1,600, and the old structure has been renovated. The additions consist of a south transept, of the same style and dimensions as the north transept, and an extension of the side chapel. The work has been done under the superintendence of Messrs. W. and G. Higginbottom, architects, Manchester.

## ARCHITECTURE.

### A MONTHLY MAGAZINE OF ARCHITECTURAL ART.

When *The Times* said that the Publishers of this Magazine had provided a really marvellous shilling's worth; when *The Daily Chronicle* said that it was a model of beauty and that it is quite certain there is a fine future for the publication; when *The Sheffield Independent* said that ARCHITECTURE was worthy to rank with either *The Magazine of Art* or *The Art Journal*; when *The Daily Telegraph* said that in point of artistic knowledge and literary excellence the Magazine was not to be beaten; when *The Daily News* regarded the appearance of this Magazine as a sign of growing public interest in building as a fine art; when *The Pall Mall Gazette* went out of its way to congratulate the Editor on his splendid effort to bring the artistic side of Architecture into the prominent position it ought to occupy; when *The Manchester Guardian* said that the production was an event of striking importance; when *The Birmingham Post* said it was truly a handsome Magazine; when 487 other Journals throughout the kingdom eulogised the work—they did but justice to a production which the entire profession of Architecture is proud of.

It is impossible to enumerate the features which from time to time will embellish it. The issue which has just left the press is the first in the field with "Architecture at the Royal Academy," and it is about the most perfect specimen of an Art production possible to find in Europe.

It is not to Architects alone that ARCHITECTURE is valuable. There is no one connected with either of the creative Arts, be he workman, craftsman, or merely a student, who can afford to neglect such a beautiful publication, so instructive, so delightful, and so useful. Every Surveyor worthy of the name will find a mass of interesting detail. Every Engineer can contemplate the beauty of constructed things.

We are informed that the Publisher will send a Specimen Copy to any *bona fide* applicant upon the receipt of three penny stamps to cover cost of postage.

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 Quantities supplied:—

Holland and Hannen...	£4,164	0	0
Lorden and Sons	4,100	0	0
Jarvis and Sons	4,082	0	0
Patman and Fotheringham...	3,961	0	0
Richardson, J. O.	3,959	0	0
Matlock	3,933	0	0
Kilby and Gayford	3,913	0	0
Lawrance and Sons	3,898	0	0
Shepherd	3,689	0	0
Greenwood	3,668	0	0

**BERMONDSEY.**—For the erection of factory for Messrs.  
 Rogers, at Bermondsey. Mr. F. W. Ledger, A.R.I.B.A.,  
 architect. Quantities supplied:—

Harbrow	£1,792	0	0
Scharien and Co.	1,683	0	0
Goad	1,642	0	0
Greenwood	1,561	0	0
Holt and Son	1,550	0	0
Woodward and Co.	1,530	0	0
Richardson, J. O., Albert Works,			
Peckham (accepted)	1,444	0	0

**BECCLES.**—For the supply of (a) 500 tons of 1½ in.  
 granite, and (b) 100 tons of 1 in. granite, for the town  
 council:—

Le Maitre, London (accepted) (a), 11s. 2d. per ton,  
 and (b), 18s. 8d. per ton.

**BODMIN.**—For the erection of the Passmore Edwards  
 free library:—

Trehane, S., Liskeard (accepted).  
 (Lowest of four tenders received.)

**BRAINTREE.**—For new infirmary buildings, alterations  
 to present buildings, and new drainage scheme at the  
 workhouse, for the guardians. Mr. Frank Whitmore,  
 Chelmsford, architect. Quantities by Mr. J. Sydney  
 Farmer, Exchange Chambers, Ipswich:—

Smith, J., and Son, Witham	£2,560	0	0
Brown, A., Braintree	2,478	0	0
Parmenter, S., Braintree	2,431	0	0
Kerridge and Shaw, Cambridge	2,398	10	0
West, E., Chelmsford	2,380	0	0
Enness, J., Braintree (accepted)	2,333	0	0
(Architect's estimate, £2,325.)			

**BRISTOL.**—For furnishing Victoria Park school, for the  
 City School Board:—

Brown, W. H. (accepted) ... £471 1 6

**BRISTOL.**—For providing a cookery-room to accommo-  
 date 54 children at Barton-hill school, for the Bristol  
 School Board. Mr. W. L. Bernard, architect:—

Bastow, J.	£520	0	0
Walters, E.	520	0	0
Gay, E.	519	0	0
Eastabrook and Son	484	0	0
Downes, C.	480	0	0
Church, W.	472	0	0
Love, E.	469	0	0
Humphreys, G.	468	0	0
Hatherly and Carr	467	0	0
Wilkins, R., and Son	450	0	0
Perrott, J.	443	0	0
Woodward, E. F. (accepted)	427	0	0
(Architect's estimate, £450.)			

**BULFORD.**—For rebuilding the Rose and Crown, at  
 Bulford, near Salisbury, for Messrs. Bartlett and Co., of  
 Warminster. Mr. Alfred C. Bothams, Salisbury, archi-  
 tect. Quantities by architect:—

Test. Quantities by architect:		A.		B.		
Hoskins, Hungerford	£1,334	£34	0	0	£32	0
Kite, H. J., Salisbury	1,291	29	0	0	24	0
Witt, E., Salisbury	1,262	35	0	0	25	0
Jenkins and Son, Bourne- mouth	1,257	9	0	0	40	0
Webb and Co., Salisbury	1,200	17	15	6	30	0
Harris, J., Basingstoke	1,190	14	16	0	Included	
Dawkins, Barford, Salis- bury	1,185	18	17	0	33	0
Hale, E.	1,170	33	0	0	34	0
Wort & Way, Salisbury*	1,040	31	7	0	21	5

\* Accepted.

**BURNHAM.**—For the construction of new roads and  
 sewers on the Crouch-walk Building Estate, Burnham-  
 on-Crouch, Essex. Mr. F. Whitmore, Chelmsford,  
 architect and surveyor:—

McGee, C., and Co., Malden	£1,026	7	0
Glenny, B. W., Colchester	1,010	0	0
Potter, H., Chelmsford	995	0	0
Jackson, J., Forest Gate	867	17	7
Trueman, J. C., Swanley, Kent	835	0	0
Rackham, G., Colchester	725	0	0
Cook, A. M., Burnham-on-Crouch*	695	0	0

\* Accepted.

**CHELMSFORD.**—For alterations and additions to Mr.  
 Jeffrey's premises, High-street, Chelmsford. Mr. F.  
 Whitmore, 17, Duke-street, Chelmsford, architect:—

Smith, J., and Son, Witham	£598	0	0
Potter, H.	550	0	0
Saltmarsh, E.	464	5	0
Fincham, W. (accepted)	443	0	0

Rest of Chelmsford.

**COVENTRY.**—For laying a water-main to Highfield, for  
 the city council:—

Cash, J. and J. (accepted).

**DEPTFORD.**—For stables at Trundley-road, Deptford,  
 S.E., for Mr. F. Francis. Mr. F. Newman, architect.  
 No quantities supplied:—

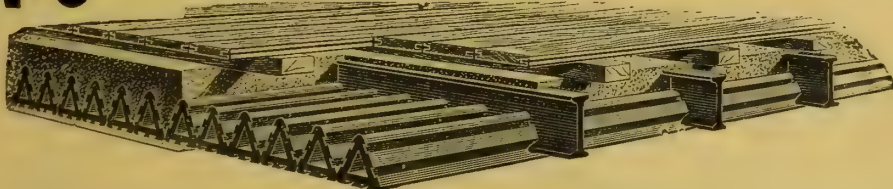
Parsons	£650	0	0
White and Co.	575	0	0
Richardson, J. O.	566	0	0
Chafen (accepted)	375	0	0

**DEVIZES.**—For the erection of new stables at the  
 brewery, Devizes, for Messrs. Wadworth and Co., Limited.  
 Mr. J. A. Randall, M.S.A., architect:—

Brown, G.	£1,290	0	0
Mullings, R. B.	1,070	0	0
Ash, H. (accepted)	965	0	0

(All of Devizes.)

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EPSON.—For house at Epsom, for Mr. Gorton. Mr. Fredric W. Ledger, A.R.I.B.A., architect. No quantities supplied:—

Balchin and Shopland	£1,487 0 0
Jedl	1,308 0 0
Hughes	1,225 0 0
Richardson, J. O.	1,181 0 0
Potter (accepted)	1,175 0 0

FAIRLEY, LEEDS.—Accepted tenders for the various works connected with the erection of a new day-school, capable of accommodating 360 children, in New-street, Fairley:—

Mason and joiners' work:—Appletard Bros., Bramley.  
Slaters:—Thornton, T. and A.  
Plumber:—Higginbotham, A.  
Plasterers:—Laycock, J., and Sons.  
Painter:—Hutton, D. H.  
(Total estimated cost, £3,400)

FAVERSHAM.—For alterations to the isolation hospital, for the rural district council:—

Seager, Laurence, Borden, near  
Sittingbourne (accepted) ... £1,797 0 0

HENDON AND FINCHLEY.—For alterations and repairs to premises, for the executors of the late Mr. L. C. Cather. Mr. George Hornblower, A.R.I.B.A., 20, Fitzroy-street, W., architect:—

First series:—  
Lidstone, N. (accepted) ... £1,761 2 10  
Second series:—  
Tont, W. (accepted) ... 860 13 9  
[Amounts wrongly given, owing to clerical error, in last issue]

HOXTON.—For additions to factory premises in Biches-street and Craven-street, Hoxton, N., for Messrs. Umfreville and Son. Mr. Robert W. Holden, architect:—

Gadden	£1,527 0 0
Scrivener	3,831 0 0
Killby and Gayford	3,735 0 0
Holloway	3,600 0 0
Todd	3,590 0 0
Richardson, J. O.	3,495 0 0
Jarvis and Sons	3,264 0 0

LONDON.—For the erection of a new section house at Albany-street. Mr. J. D. Butler, architect. Quantities supplied by Mr. Thurgood:—

Holloway	£6,800 0 0
Grover	6,785 0 0
Perry	6,770 0 0
Scrivener	6,730 0 0
Ansell	6,700 0 0
Lawrance and Sons	6,697 0 0
Richardson, J. O.	6,692 0 0
Higgs and Hill	6,684 0 0
Lathey Bros.	6,547 0 0
Messum	6,527 0 0
Chessum	6,479 0 0
Willmott	6,234 0 0

LONDON.—For alterations and additions to Leman-street police-station, for the Receiver of Metropolitan Police. Mr. J. Dixon Butler, architect. No quantities supplied:—

Higgs and Hill	£784 0 0	£44 0 0
Richardson, J. O.	730 0 0	Not stated.
Holloway Bros.	687 0 0	63 0 0
Lathey Bros.	670 0 0	56 0 0
Lascelles and Co.	645 0 0	Not stated.
Lawrance and Sons	644 0 0	30 0 0

A. Alternative estimate for Jarrah-wood paving.

LONDON.—For the construction of a section of the Central London Railway:—  
Scott, W., and Co., Newcastle-on-Tyne (accepted).

MAESTEG, GLAMORGANSHIRE.—For three schools, to be built on the Plasnewydd site at Maesteg, and to accommodate 258 boys, 312 girls, and 450 infants, for the school board. Mr. E. W. Burnett, Tondü, near Bridgend, architect:—

Davies, E. D., and Son	£12,804 12 3
Willcox, H., and Co.	12,367 8 0
Lissaman, W.	10,815 0 0
Gaylard, P.	9,900 0 0
Evans, D., and Sons	9,547 8 4
Francis, W.	8,950 0 0
Rattray and Jenkins (accepted)	8,706 0 0

MAESTEG, GLAMORGANSHIRE.—For a mixed school, to be built at Troedrhiew, Garth, to accommodate 250, for the school board. Mr. E. W. Burnett, Tondü, near Bridgend, architect:—

Willcox, H., and Co.	£2,690 0 0
Evans, D., and Sons	2,372 0 0
Lissaman, W.	2,100 0 0
Davies, E. D., and Son	2,085 0 0
Rosser, W.	1,958 0 0
Evans, E.	1,852 12 0
Gaylard, P.	1,827 0 0
Hurley, J.	1,797 0 0
Rattray and Jenkins	1,763 0 0
Francis, W. (accepted)	1,650 0 0

MAIDSTONE.—For making-up Douglas-road, for the town council:—  
Logan, W. J. (accepted) ... £231 0 0

MAIDSTONE.—For making-up Holland-street, for the town council:—  
Logan, W. J. (accepted) ... £108 5 0

MAIDSTONE.—For fencing the allotment grounds at Loose-hill, for the town council:—  
Startup, D. (accepted), 11s. 6d. per rod.

NEWTON, Ayrshire.—For the construction of the Newton esplanade, for the Glasgow and South-Western Railway Co.:—  
Clark, W., Ayr (accepted).

NEWMARKET.—For erection and completion of police-station, &c., at Newmarket, Suffolk, for the West Suffolk County Council. Mr. F. Whitmore, West Suffolk, Chelmsford, and Bury St. Edmund's, architect and county surveyor:—

Scales and Robins, Cambridge	£5,065 10 0
Saint, J., & Son, St. Ives, Hunts	5,300 0 0
White, J. P., Bedford	5,293 0 0
Linzell, H. J., Newmarket	5,093 0 0
Hipwell, S., Wisbech	5,000 0 0
Bateman, A. J., Ramsey, Hunts	4,997 0 0
Collins & Barber, Downham Market	4,990 0 0
Kerridge and Shaw, Cambridge	4,749 0 0

\* Accepted.

NORTON.—For additions, alterations, and repairs at the Carr Farm, Norton, for Mr. N. H. Bacon, Raveningham Hall. Mr. Arthur Pells, F.S.I., Beccles, architect and surveyor:—

Youngs & Son, Norwich	£787 0 0	£20 0 0
Elden, L., Loddon	598 5 8	7 10 0
Elden, J., Broome	555 5 5	10 0 0
Bunn, S., Wheatacre	528 10 0	14 0 0
Rayner, B., Harleston (accepted)	474 0 0	3 0 0

A.—Less if tiling of barn be repaired, instead of stripped and rehung.

NORTON.—For additions, alterations, and repairs at the Low Farm, Norton, Norfolk, for Mr. N. H. Bacon, Raveningham Hall. Mr. Arthur Pells, F.S.I., Beccles, architect and surveyor:—

	A.	B.	C.
Young and Sons, Norwich	£178	£399 0 0	£776 0 0
Wynes & Whall, Thurlton	232	478 10 0	710 10 0
Elden, J., Broome	218	449 17 9	667 17 9

A.—House. B.—Buildings. C.—Total. \* Accepted.

NUNHEAD.—For the erection and completion of new public library at Gordon-road, Nunhead. Mr. R. P. Whellock, A.R.I.B.A., architect. Quantities supplied by Messrs. Franklin and Andrews:—

Holloway Bros.	£2,870	£3,060
Watson and Ellwood	2,840	—
Jerrard and Sons	2,479	2,639
Maides and Harper	2,477	2,677
Marsland	2,476	2,641
Richardson, J. O.	2,433	2,573
Smith	2,367	5,527
Holloway	2,334	2,514
Evans	2,319	2,459
Downs	2,276	2,425
Gough (accepted)	2,274	2,454

A.—Alternative estimate.

ORHAMPTON.—For the enlargement of the board schools at North-street:—  
Jordan and Ball (accepted) ... £348 2 6

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# THE BUILDING NEWS AND ENGINEERING JOURNAL.

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FRIDAY, MAY 8, 1896.

## "THE PLASTIC ARTIST NEEDS NO FESTIVAL."

SO says Goethe, who, as a great artist and a great critic of art, speaks with authority. Wilhelm, the hero of his romance, has arrived in the course of his travels at an ideal home of culture. All crafts, from the lowliest to the loftiest, are practised there, and at the time of his arrival are holding their yearly festival. Painters, poets, and musicians are exhibiting, reciting, or performing their creations in public. Yet there is one exception to the general jubilation: the architects are still at work. A peculiar silence reigns over their quarter, though it is beyond all comparison the finest in the region. The traveller asks why, and receives for answer the adage which heads this article, "The plastic artist needs no festival. When he has accomplished something excellent, it thenceforth stands before the eye of the world. Its whole being and nature is a perpetual exhibition. It calls for no repetition, no new effort, such as the musician has for ever to afflict himself with. If you seek our exhibition of architecture, look around you at our buildings of every sort." This was a satisfactory reply in an ideally perfect town, into which nothing common or unworthy had been allowed to enter. It is not equally satisfactory in any modern city. We cannot call London, for instance, an exhibition of architecture. It is simply a collection of crudities, vulgarities, and failures, amongst which, once in a while, we come on something that really deserves admiration.

It is the most natural thing in the world that we should wish to bring all the admirable buildings together, and make a show of them. It is quite true, as Goethe says, that they are always on show; but then a multitude of them are on show where few persons see them. Some are in back streets and slums; some, like Mr. Belcher's Institute of Chartered Accountants, are in unfrequented passages; and some, like Mr. Norman Shaw's and Mr. Ernest George's most interesting designs, are in remote places where hardly anybody goes. If we could only get them away, with or without the consent of their owners, and set them up, say, in the Green Park from May to August, we should acquire some new ideas about the preferences of the public. One might safely back an actual exhibition of architecture such as this would be against the exhibition of painting and sculpture on the opposite side of the road. In real buildings the public do feel some interest. At the very lowest, that interest shows itself in a desire to look over all the houses that are vacant and the lodgings that are to let. Many people—besides burglars taking notes with a view to subsequent business—find a sincere pleasure in this seemingly unattractive occupation. "Wandering Christians," as Mrs. Lirriper called them, inspecting her apartments without the slightest idea of hiring them, were the plague of that good woman's life: people who had the root of the matter in them—if the root of it is an interest in planning and construction of the most hackneyed kind—but who had never produced the flowers and fruits of a taste for detail or a love for good composition. Our great churches and palaces attract crowds to see them. Part of the attraction, of course, lies in their history and associations. Westminster Abbey would have fewer visitors with no tombs and no Poets' Corner; but it would not be quite deserted. Lincoln

Cathedral and York Minster have little beyond their own merits to draw the general public; yet the public go, and go with vast, if indiscriminating, admiration. They worship they know not what: yet even this is better than not to worship at all. It indicates a faculty which might be trained, though it seldom is.

The public does not flock in this way into the Architectural Room at the Royal Academy. That is a calm and quiet haven; a place for retirement from the world; the meditative man's retreat, and a bower for confidential conversations between engaged couples. But this is because the Architectural Room does not, and cannot, exhibit actual architecture at all. It exhibits mere schemes and sketches for it, which one must be an architect himself to understand. There are actual paintings on view by hundreds and actual sculptures by scores, but no actual architecture at all. The painter and the sculptor are really present in their work; but the architect only forwards an apology for his unavoidable absence. That is what his sketch amounts to: a description of what he is doing some miles or hundreds of miles away, and a regret that he cannot bring it in to be seen. The descriptions interest other architects, whose training enables them more or less to understand them, and that is the Academy's justification for having an Architectural Room. But they do not interest the untrained public, and that is the Academy's excuse for having only one such room.

The difficulty is in the nature of things. It arises out of the very obvious fact that buildings are not movable, and cannot be brought together. If we have nothing better to do, we may spend our lives in arguing for or against the desirableness of an architectural exhibition; but we shall never get one. An architectural exhibition is an impossibility. Suppose we collected the scores of a number of operas and oratorios, took a hall, and hung them up on the walls, and then called this a "Musical Exhibition." It would interest musical adepts just as the Architectural Room interests architectural adepts; but the mass of people who love music would not go there. The crowd cares a little for real music and for real architecture; but not a whit for paper representations of them. That is the ultimate fact we have to reckon with, and though there were many ultimate truths in Mr. Masey's late address on "The Position of Architecture at the R.A.," he hardly seems to have given this one the prominence it deserves. Some 30 years ago there was in London, for several seasons, a so-called Architectural Exhibition, got up and managed by architects, and quite unconnected with the Royal Academy. But nobody came to it except members of the profession, and it finally died of inanition.

Yet there is a ray of hope. Though architecture itself cannot be moved and collected, there are architectural details and adjuncts which can. The suggestion that the Academy might make a winter exhibition of these is a good one. They would be real works as far as they went, and not mere ghosts or pictures of works, and they would attract spectators, as realities do. Real metal-work, real mosaic panels, real decorative carving, in wood or stone or marble, real stained glass (and not, as Mr. Masey proposes, mere cartoons for it), would, if well selected, be worth going to see. Cartoons, in fact, and all their tribe, are the very things which need to be kept out of a collection meant for the public. Of course, they are vitally necessary, and a gathering of them, by artists for artists, might be instructive enough. But to outsiders they are misleading, and the more misleading the more attractively they are got up. What is the history of half the trashy, tawdry windows which deface our churches? It is determined to set up a memorial of some person or some event. A committee is appointed, and they

decide that the memorial shall be in stained glass. It does not occur to them that they want an architect. They do not see what architecture has to do with it. It is only a question of good taste, they think, and who would dare to say they lack it? They feel abundantly competent to decide for themselves, seeing that the problem is only to get the prettiest window for the least possible money. They send to half a score of pushing firms for designs and prices, and receive half a score of the dearest little sketches anyone could wish for. Then they discuss them, and finally, at a very low price, select the prettiest of the pretty. The figures show deep devotion, combined with undisputed elegance. There is nothing bold or coarse about them, and then the colours—those lovely reds and blues! If they are so charming on paper, what will they be in reality!—provided, of course, that the manufacturers keep those abominable leads as narrow as possible. This they are instructed to do, and in time the practical issue of all the committee's labour arrives. There was one thing they forgot to discuss, and that was the glass itself. Consequently their chosen cartoon has been worked out in material of the thinnest, rawest, paltriest quality that can be had. There is no depth, no softness, no gradation of colour in it. The glazing, as such, is on the level of that which the speculating builder puts into his £30 houses. The committee, after all, have only set up a magnified peepshow, to be seen on Sundays and weekdays, till some new and better Puritans shall arise and destroy it.

By exhibitions of architectural details, some of the people who pay for these details might by degrees learn to become judges of them. Really good work as yet, whether in glass, metal, carving, or anything else, is too scarce and too scattered to impress the public much. But if a quantity of it were brought together and put before them by competent authorities, such as might be found amongst Academicians and Associates, they might begin dimly to discern what goodness in such matters is. Then deceptive trade sketches and misleading trade catalogues would cease to bring in customers, and the true ability, which seldom goes along with commercial enterprise, would have a chance. But the idea is not new. Without including Building Trades Exhibitions, which contain more to repel than to attract the man of artistic tastes, we have in the South Kensington Museum a starding show of architectural details, which is far from being unpopular. But it deals with the past rather than with the present, with the productions of dead men more than of living ones. It is invaluable as reminding us of what has been done, but it hardly attempts seriously to tell us what is being done now. This is why an annual exhibition is needed. It would be in comparison with the Kensington Museum pretty much what the Royal Academy is to the National Gallery—a sample of the year's production as compared with the productions of all the ages. It would have the attraction of newness about it, and its contents, even if poor things, would be our own. Goethe's rule is one that demands some exceptions. Sound enough in his own ideal realm, it needs to be relaxed and modified to this work-a-day world. Here, even the plastic artist may welcome such festivals as it is possible to give him, and if the architect can have none that sets forth his doings in their completeness, there is all the more reason why he and his fellow-workers should show their actual work in such fragments as they may.

## THE EXPERIMENTAL AND THE PRACTICAL.

WHAT the practical architect is most in need of is authority on those subjects of his profession of which he is in daily quest.



He now suffers under what may be termed "diffuseness" in the sources of his information. A plethora of opinion on any one question is not half so desirable as a few well-recognised facts. When he begins a design for any building that is a little out of the beaten track—say, a theatre, or a concert or assembly room, he is often lost amid a maze of perplexing ideas and considerations. He finds a plan for a building of a similar kind, but it does not suit the site or the requirements, and, after a fruitless search for types, he is thrown back on his own resources—wiser it may be, but still without the right clue to a solution of the problem. He is almost like a rudderless craft—lost in a troubled sea of bewildering thoughts, but without any chart or definite haven of certainty. A number of plans of theatre auditoria may furnish him with a fair notion of such a building, but without any clear direction, or as to what principle he may take for his guidance. Which is the best proportion for his auditorium or room; what the right width, depth, and height of his stage; the proper width of corridors and staircases—these he has to determine for himself. How is he to decide about the isacoustic curve of seats, or the "lines" of his pit, stalls, and private boxes, dress-circle, upper-circle, &c.? Is it not the general fault that an architect, intrusted with a building of this class, which may be his first, copies the "lines" of existing buildings, and adopts a faulty plan?—as, for example, in making an awkward angle in the front line of private boxes to the proscenium, or in the arrangement of the pit, which is considered the backbone of the theatre, he may commit the fault of making the pit extend too far beyond the circle front, or of giving the floor a rapid inclination which regulates the angle of the tiers above. Or, if it is a concert-room, he adopts a proportion of length, width, and height which are not of any harmonic relation; makes his orchestra too large or deep, or commits the equally reprehensible blunder of not providing the necessary accommodation for the artistes, in the shape of retiring and dressing-rooms for the performers, musicians, and soloists, or proper vestibules, and crush-rooms, and foyers for the public. A still more crucial step is to determine the form of a concert-hall. Is he to accept Herr Muller's idea, that a concert-room should be like a violin—have all its parts free to vibrate in unison with the voice, that the walls, roof, and floor should be constructed to reinforce the sounds? Or is he to eschew all such theories, and follow the types of building which give the largest accommodation are fireproof, and are proof against panic? He cannot do both. In buildings like churches the requirements are better known, and the architect has to adopt a good model that is generally approved for ritual or preaching purposes, whichever of these is considered paramount. But here also the variety of examples and types is too embarrassing to afford any definite guidance to the inexperienced builder of churches. There are rules about proportions, seating, the dimensions of the sanctuary, and its fittings and furniture about which books and plans are often silent. Even the requirements of a large modern residence are so many, and such diverse views are entertained by clients and hygienists about sanitation, warming and ventilation, decoration, and other requisites, that a very considerable amount of well-ordered and classified information is necessary. It is easy for the architect to make a mistake about such essentials as aspect and prospect of rooms, the fitting up and warming of conservatories, billiard-rooms, household fittings, and other things, seeing how many are the failures, and how much is required by the host and hostess. We have seldom known an architect to give unqualified satisfaction in these matters, and that is not because he has committed any egregious

error, but simply owing to the architect not having all the best or the latest improvements at his command, showing himself ignorant or forgetful of the latest "fad" or craze in domestic appointments or decoration. Forgetfulness in minor things is a sin in the eyes of some people. Not knowing what Mr. Brown or Mrs. Jones has got, is another unpardonable offence. A wrong estimate is never forgotten or forgiven. These are all things difficult to learn; but when once learned, they are worth all the theorising in the world, and it is just because architects do not trouble to learn them that they are so constantly failing to satisfy their employers. It is in such little things that the average architect fails. He is called to task over a dining-room stove, a cooking-range, a new plaster or a wall fabric. No doubt it is very excusable; but it is the very ordinary blunder of building that is never forgiven by the typical client. He has employed it because it has been well spoken of, is advertised, has been used by Mr. So-and-So, but from no actual experience of his own. Some other invention or appliance might have done better. It is easy to specify a ventilating or heating arrangement; but the question is, is it the best adapted for the purpose, for drawing off the vitiated air from a room or set of rooms, or for introducing the required temperature in the most simple manner? These are matters about which absolute and certain knowledge is necessary.

A great many of the troubles experienced by the architect arise from unacquaintance with correct or authoritative data. To a large degree he is a man of figures; but those he finds to his hand are not always reliable. If he wants to know how many people can be accommodated in a room of a certain area, he will doubtless find that there are two or more statements, each reckoned, no doubt, on some particular principle. One estimate is based on standing, another on sitting; another may make certain allowances for open spaces, and so on; so that the most reliable method is for him to find out by actual observation how many people of average stature can be made to stand or sit on a given area, and thereby deduce how many people, or what fraction, can he stand or sit on a square foot or yard. We all know how conflicting tables of loads for floors of certain materials are; we may take up half a dozen textbooks, and find them all different, and these variations can only be accounted for by supposing that each experimentalist has adopted a system of his own. One author has very truly remarked that no one is competent to devise or carry out such experiments who is not trained in those departments of mathematical and mechanical science relating to the subject; hence it is the utter confusion and contradiction which result from a series of tests wrongly conceived and inadequately carried out. Tests on the strength of materials have been conducted by such means, and have become unreliable. One class of men has given us theories and formulæ, and an entirely different class has given us facts and figures, and so long as this separation existed the conflict between theory and practice was complete. Before our formulæ will represent actual facts, we must bring the experimental and the mathematical minds together, or the two phases of the question must find a place in the same individual mind. In a word, the experimentalist and the maker of the formulæ must be the same person, if possible, and this end will be reached when every building school will have its own laboratory for testing materials and structures. Few architectural students know anything definite of materials, such as stone, timber, or iron; they are obliged to accept the published results or descriptions, or those put forward by the manufacturer. If they are not disappointed, well and good; if the material turns out inferior, or if decay or

shrinkage occurs, why, the employer suffers, the specification has not been complied with, or—well, the less said about it the better. Yet absolute facts ought to be attainable, and it ought to be as easy to select the right stone, or timber, or cement, as it is to choose a good hard brick. The only reason why an absolutely certain opinion cannot be formed about such materials is because they are of complicated nature, and not homogeneous in their structure. Brick is made under known and uniform conditions; but stone and timber are natural productions of ever-varying composition, making it more difficult to ascertain their properties or strength. We have to discover their behaviour under certain conditions of atmosphere or moisture, and the factors which influence them are not so well known as in other cases. To distinguish between what is certain and assured and that which is merely experimental and doubtful, is one of the most useful acquisitions of the architect, and the more accurately he can do this, the more capable he becomes of carrying out his work with discretion and success.

## PICTURES AT THE ROYAL ACADEMY.

[SECOND NOTICE.]

LAST week we gave our impression of a rapid glance at a few of the principal pictures at Burlington House—so far, indeed, as it was possible in a few hours' notice to do so. We this week continue our survey of the leading canvases, and will try to fill up with more detail a few of our descriptions of the more important pictures already noticed. In Gallery I., besides the President's figure composition of St. John the Baptist, "A Forerunner," W. Q. Orchardson's "Reflections," and F. D. Millet's clever incident, "Lucky at Cards," of two card-players (Cavaliers) in the parlour of a country inn, one of whom is winning, while a pretty parlour-maid sits on the edge of a table, her solicitude being obviously bestowed on the loser—all noticed last week—we have Ralph Hedley's "Barring-Out Day" (34), a number of children shutting their master out of the schoolroom; and a pathetically conceived picture, by J. B. Burgess, "The Widower," a scene in an Italian or Spanish church. The three daughters of the dejected widower, who sits with his head bent down in anguish, are full of tenderness; the eldest with her rosary seems to feel for her father's grief. These are the chief subject pictures, while the splendid landscapes of John MacWhirter, "Bonnie Scotland," with its mountains and loch, and David Murray's fine piece of colour in his "Musk Mallows," which we have referred to, are among the principal works. In the second gallery the first-named landscapist has a glowing piece of colour "Golden October," in which the charm of touch of Mr. MacWhirter is seen in the forest birch backed by hills. Albert Goodwin's imaginative subject, "The Besieged Town of Mansoul," a piece of imagery suggested by Bunyan's "Holy War," is a fabric of Oriental magnificence, with its cupolas and minarets high above a harbour, in whose waters the visionary palace is reflected amidst vessels and lights. The blue moonlight tones impart an air of mystic grandeur to the scene.

Gallery III. We only had time to refer to the few leading pictures, including the late Lord Leighton's "Clytie." In addition to what we have said on this masterly composition, it may be of interest to say that this work was painted during the illness of the illustrious painter, and, though unfinished, may be considered one of the finest of his studies. In all essential features the picture is complete, as far as the painter was able to depict, with no faltering hand, the beautiful figure of the kneeling goddess "in adoration before the setting sun, whose last rays are permeating her whole being," to



quote from the late President's own words. With upraised arms she is entreating her beloved not to forsake her. The head, arms, hands, and amber-green draperies of the adoring maiden are not only vigorous and gracefully drawn, but possess that indescribable charm of mobility and earnestness which distinguished this painter's work. The luminous cloud typifies the anger of the god to whom Clytie is making so passionate an appeal. The Fine Art Society are to publish an engraving of it.

H. H. La Thangue's picture, "The Man with the Scythe" (195) is full of deep pathos. The sick child, who rests almost lifeless in a chair at the outside of a cottage door, with his mother tenderly stooping over him, is painted in very sombre tones. Passing by the wicket gate a labourer carrying the ominous implement, a scythe, looks towards the little invalid. There is doubtless an allegorical meaning conveyed by the incident. H. W. B. Davis, whose love of rustic hedgerows and flowering shrubs is always popular, paints "An Orchard in Wales." The blossom of apple-trees, which catch the bright sunshine, is wonderfully realistic and vivid. "Pensioned Off" (262), by J. B. Burgess, is another example of this painter's Spanish ecclesiastical *genre*. There is much that is touching in the expression of the old violinist, with his youthful son holding his arm, as in the uplifted and sorrowful face of the musician. He is apparently being censured by the vicar, who is seated in the sacristy of a Spanish church, accompanied by another ecclesiastic and members of the choir. The details of the apartment and the expression on the face of the vicar and his colleague are painted with knowledge and technique. Last year Mr. Burgess gave us another similar subject—ecclesiastical students reading prohibited books. "Conquerors" (272), by Hugh de T. Glazebrook, is a large masterly canvas hung rather high. The scene is a battlefield, whereon we see the dead and dying who have managed to gather round a large Calvary, some lying prostrate on the steps, others gazing, wounded, on the figure of the Crucified. Beyond we see another, but an earthly conqueror, on horseback—Napoleon, who is slowly surveying the scene of his victory; behind him the remains of his guard. Scarcely has the smoke of the battle cleared away. Amidst the scene of desolation and triumph the uplifted crucifix forms a central feature, which the painter has introduced into his picture with telling effect. J. C. Hook's "Breadwinners of the North" (279) is full of freshness, with that sense of light and air which Mr. Hook so admirably imparts. The scene is one of those natural tidal harbours or inlets of the sea found on the coasts of Caithness-shire. Natural jetties of rock covered with seaweed run into the sea, and leave a quiet haven in which small fishing-boats are moored, and other craft are making for it. The sea is of that soft pearly hue and reflected light which is noticed on the northern coasts—not of the deep blue intensity seen in the same painter's Cornish view.

P. H. Calderon's "Springtime"—a fair young girl in white drapery through which her figure is displayed, sitting on the trunk of a beech-tree in a forest, musing, the grass at her feet dappled by primroses and bluebells—is an idealised study, a little unmeaning in the garb worn in such surroundings. The fine-toned landscape, "September Sunshine" (281), by G. D. Leslie—a sunny meadow sloping down to the river, with a background of trees illumined by a warm afternoon sun—is delightfully tranquil. The reflection of the dark, massive foliage in the mirror-like water makes a rich harmony and gradation of tone.

E. J. Poynter's work is less attractive than his "Ionian Dance" of last year. "Neobule" (300) is a maiden who, it is said—so the story runs in Horace's "Ode"—was

chidden by her uncle, and was forbidden to enjoy the delights of Cupid. She is here shown seated on a low stool, resting her head on one arm, disconsolate at her seclusion, clad in an amber-coloured robe, in a marble vestibule. The accessorial accompaniments—the closed gate, the garden beyond—are painted with much scholarly knowledge, and the colour is refined. Neobule's work has dropped from her hand: the balls of wool are lying on the marble floor, while she is soliloquising on her lover Hebrus.

Briton Riviere has two subject pictures in which dogs are introduced. "Aggravation" represents a humorous incident, in which the painter takes us back to Mediaeval times. The scene is a kennel of a castle, of which we see a high wall. Leaning over it a jester, with his cap and bells and parti-coloured costume, is teasing a number of dogs of the deerhound sort. They are seen clambering against the wall, and barking and snarling, and showing their teeth at the intruder. Their infuriated manner and their muscular efforts to reach their enemy are very cleverly painted. His other subject, "Trust Her Not," in the Ninth Gallery, exhibits a deep insight into the habits and faithfulness of dogs. The picture shows a large silken-haired collie beside his mistress, who is pouring her praises into his ears. The dog regards sagaciously his young and coquettish mistress, whose protestations of affection are fickle, and are not always to be trusted. It is this lesson suggested by the title that the painter has so well conveyed.

"A Venetian Christening Party" (298), by Henry Woods, is a large crowded picture. Ladies, nurses, and children are descending a staircase outside a church, all gaily attired. The colours are brilliant, and the drawing of the little girl and lady with fan is all that can be desired. By the side of other more sombre pictures, this one looks rather garish; but the painter has scarcely exaggerated the effect of Venetian colour and light.

In Gallery IV. we pass by a few works of more or less interest. Pepys Cockerell's "Our Lady of the Ruins," St. George Hare's "Prisoner of Chillon" (307), John White's clever piece of *genre*, "Be it ever so humble there's no Place like Home" (312)—a village stable and a sympathetic youth leading home a donkey. Seymour Lucas has this year illustrated another of those historical incidents which he has made his own, "A Story of the Spanish Main," the incident in which Salvation Yeo is standing and speaking before Sir Richard Grenville and Amyas Leigh, a story told in Charles Kingsley's "Westward Ho!" The interior of the chamber and the expression of the speaker and listeners are painted with dramatic force and interest.

Frank Dicksee, whose symbolical subject of "The Mirror" we noticed last week, sends also a large picture entitled "The Confession" (340), in Gallery IV. We are left to conjecture the meaning of the painter. A lady in an arm-chair in her dressing-gown, with the full evening light from the window upon her, sits opposite her husband, who is ensconced in the seat of a deep-jamb window, and she is telling him the fatal secret. His face, buried in shadow, is serious and thoughtful; he holds one hand to his brow, as if in deep thought, listening to her intently. This is all that the picture reveals. The anxious expression on the lady's face, who is bending forward, her thin hands nervously entwined, but displaying the wedding-ring on her finger, and the soft, greenish-grey twilight which suffuses the scene, are painted with much subtlety. On the whole, we prefer "The Mirror," with its wonderful Oriental tissues and charm of refined colour, in which the pearl-like inlay of the chair so largely contributes; not less, the beauty of the dark maiden, who is holding a mirror, and whose

attitude and delicate draperies are so charming.

Everyone remembers T. C. Gotch's remarkable decorative subject, "The Child Enthroned," the inner mystical meaning of which was a question for critics. Last year he showed us an allegorical picture, "Death: the Bride"; this year, in Gallery IV., we have another highly decorative subject, treated with much beauty and power, in "Alleluia." A choir-like array of children standing in orderly ranks, and clad in rich embroidered robes, against a background of gold, with a central niche or recess, singing a hymn of praise. Sweet and seraph-like are the faces of this choir of girls, each of them with an expression of her own devotion, as they join in the hymn, "Sing praises to God, sing praises; sing praises to our King, sing praises." The elder and taller girls stand behind the younger and shorter ones, and in the centre niche is an angelic-looking maiden, with clasped hands and devout expression, who leads. Each holds the scroll of the canticle. As a work of figurative meaning, archaically treated, Mr. Gotch's work is interesting; the brilliant colours of the robes of green, red, blue, and other shades, and the details are well harmonised and balanced. We understand this work is acquired by the Chantrey Trustees.

Peter Graham's grand rock and sea, "From Beetling Sea-Crags where the Gannet builds" (322) rightly occupies a centre position under Richard Jack's large picture of "Cleopatra." The precipitous rock which rises jagged, and overhanging the lashing sea at its base, is realistically painted, its nooks and crannies tenanted by the sea-bird whose haunt it is. The foaming waves and the sea mist are equally strong. There is something of pathetic interest in Margaret J. Dicksee's interesting piece of *genre*, "The Early Days of Swift and Stella." A fair-haired little girl is seated at her lesson at a table, while Swift, by her side is, with fatherly attention, looking over her work. We must not pass unnoticed the President's standing portrait of Sir Richard Quain, Bart., M.D., F.R.S., a work full of character, slightly painted in parts, though it hardly comes up to the queenly-looking portrait of the Marchioness of Tweeddale (whose portrait, a three-quarter-length standing figure in walking costume, by Knighton Warren, was a prominent feature of Gallery VIII. just fourteen years ago), and certainly not to Mr. Orchardson's full-length seated figure enveloped in a fur-trimmed crimson robe of the Lord Provost of Aberdeen, which portrait presides over the end of the Third Gallery.

We must pass rapidly over the V., VI., VII., and VIII. Galleries. Stanhope Forbes, A.R.A., last year exhibited his now well-known picture, "The Smithy," in which he depicted with realistic truthfulness the conflicting elements of fire and daylight. This time he exchanges the smithy's shed for a cowshed—a humble shelter in which a new calf, just born, is receiving all the attention and kindly offices of the wife and family of the owner, and is taking his earliest nourishment, while the old cow appears quite unconcerned at the auspicious event. The contrast of the dark shadows and the blue light of early dawn through the windows with the warm glow from the lantern in the hands of the wife is vividly depicted. The ruddy glow illumines the family group which have come to see the new arrival, and it is this element of contrasted light and shadow in all Mr. Forbes's pictures which has given them their popular claim. We all admired that wonderful study of red glowing iron in "The Forging of the Anchor," and since then the painter's efforts have been directed towards the cultivation of the realism of the forge and the smithy. And is there not also as true a poetic feeling to be awakened in this class of subject as there is in the landscape or domestic incident?



Alfred East's greyish-toned landscape, "A Pastoral" (382); David Murray's rather formal and uninteresting landscape, "River and Rail" (401); Ernest Parton's "Last Gleam of Sunlight" (421); Thorne Waite's breezy landscape, "The Wind that Blows on the South Downs," are all good examples of landscape.

Solomon J. Solomon has a large upright canvas, "The Birth of Love," representing Venus in the form of a beautiful full-length undraped figure standing on a pearl-like shell on the crest of a wave; winged Cupids whisper in her ears. As in all Mr. Solomon's ideals, there is grace and refinement in the composition; the anatomy of the nude figure is faultless, the modelling is delicate, and the body of the goddess catches the rosy light of the sun. In Gallery VI. is Arthur Hacker's large picture, "The Cloister or the World" (478). The painter represents a black-robed nun kneeling near a tree in an orchard, wrestling in prayer against the temptation of the world. A white-robed guardian angel holding a lily stands beside her, while behind, in drapery of rainbow hues, a fascinating maiden, attended by a cupid, tempts the novice. The painter has succeeded in poetically suggesting the spiritual conflict; there is a French manner, calling in mind the method of the *pleinairistes* in the composition. In the painting of the sunlit orchard and the figures of the nun and radiant angel, also of the pleasure-loving tempter, there is considerable technical skill, and the strong contrast between the black and white robes and the green background was not an easy task to bring into harmonious relation. John W. Godward's study, "Campaspe" (521), as a decorative and technical scheme, is clever. The beautiful nude figure of Alexander's mistress is shown standing against a bronze dado, the wall above having a circular panel of mosaic. The flesh tint of the maiden is set off by deep blue drapery, and she stands on the marble pavement of a bath. The blues of drapery and mosaic form a rich harmony of contrast, and the whole is handled with technical skill.

We noticed last week one of B. W. Leader's landscapes, "A Golden Eve," in the Third Gallery—a very splendid study of a row of thin trees in a forest, suffused with the glory of sunset light. Our only criticism is that the exquisite precision and glowing beauties of such aspects of nature may lend itself to a mannered style, and to the oleograph or chromo-litho reproduction too easily. It is rarely a painter can give us so much light and sense of air as Mr. Leader, and it is just this luminosity and clearness in his canvases that make them so popular, and brings with them its own penalty—easy reproduction. "The Skirts of a Pine Wood" (448), in Gallery V., is a large upright canvas, perhaps the strongest work. Tall bare stems of the trees rise the whole height, and catch the glowing light of the setting sun, while through the upper branches of their dark foliage blue sky is seen. The distance and foreground are admirably painted.

In Gallery VII. there is only one great picture, and that is by the American painter, Edwin A. Abbey, whose large work "Richard, Duke of Gloucester, and the Lady Anne" (616), is one of the most remarkable in the Academy, though not, perhaps, in the sense of colour or atmosphere. It has rather the hard tapestry look or motive in its composition and colour. It represents the wooing of the young Lady Anne, daughter of the Earl of Warwick, and widow of Prince Edward, by the tyrannical and crook-back Richard. It is a funeral procession, which crowds the canvas, and the central figures are the fair Anne and Richard, whose scarlet cloak forms a forcible contrast to the long black and embroidered train of the youthful widow, and the black-robed retinue of followers with their black hoods, which half-conceal their faces. These men-at-arms carry red pikes and

halberds reversed, which lend a solemn and mysterious air to the procession. The cruel duke turns his head to Anne, and holds up a ring in ominous earnest. Mr. Abbey has given us an interesting episode, told with dramatic skill. The gorgeously-draped hearse under a canopy, the youthful Anne with her quaint headgear of the period, her ample robes and long borne train, richly embroidered, the gesture of the hypocritical duke, who walks by the side of the lady, compose a wonderfully painted drama, in which the Mediaeval costumes have been strongly accentuated.

In Gallery VIII. we have Frederick Goodall's large centre and luminous sea and coastscape, "Cloud Shadows Over Sea and Land, Beachy Head," and above it a very beautiful composition by Lawrence Koe, "Venus and Tannhäuser" (661), very subtle and delicate in the modelled and recumbent figure of the goddess and the flesh-tints. She is represented much foreshortened in the limbs, and her right hand is stretched out to the kneeling Tannhäuser. Last year we had on this wall George W. Joy's admirable picture, "Joan of Arc," showing the Maid of Orleans lying in full armour, at her feet an angel, and we may incidentally mention that in the present Black and White Room there is a very excellent steel engraving of Mr. Joy's picture by Arthur Comfort, the Chairman of the International Society of Wood Engravers. Other pictures in this Gallery we must postpone.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—II.

THE central area of the Architectural Gallery is occupied by a large-scale model of 8ft. to the inch representing Bamburgh, "King Ida's castle, huge and square," throned on a big triangular rock commanding the horizon, and washed by the North Sea. Mr. Chas. J. Ferguson, well versed in Mediaeval strongholds, is converting this fortress into a sort of convalescent home at the cost of Lord Armstrong. Much of the poetry of this famous place remains as depicted by Sir Walter Scott; but restorations and renovations have helped to mark its history so that the dramatic shudder of assumed concern with which some anti-touch protectionists refer to any further additions to these old precincts are scarcely worthy of attention. To render the castle a home of refuge and recovery for the sick must be a work of true philanthropy, and we have little doubt that Mr. Ferguson will execute his undertakings in an appreciative and conservative spirit. The model, however, occupying this gallery is too much of a good thing, and, moreover, is not very interesting either, requiring a showman to point out its peculiarities, while the plans pasted round the sides are troublesome to the tired visitor. In general effect, the exhibit recalls one of those toys into which the player drops a marble somewhere near the top taking the chance of the game as to which point it will ultimately emerge from. The exhibition of models, such as that shown last year by Mr. E. S. Prior would materially increase the variety of the collection; but this advantage can hardly be claimed for the present large and painstaking performance. Following now somewhat more closely the order of the catalogue, we may note a selection of exhibits not previously named. St. Saviour's Mission Church, Ealing, by Mr. G. H. Fellowes Prynne, is shown by an interior illustrating a brick arcade carried up to the springing of the cove under the barrel roof of the nave, with shafts relieved by bands of stone. The Park Hospital at Hither Green, by Mr. Edwin T. Hall, furnishes a large bird's-eye pen-view with utilitarian and by no means unsightly buildings, and the competition design hard by for the Church of St. Oswald, Fulham, by Mr. E. P.

Warren, deserves a note for its freshness and graceful character. Mr. A. H. Skipworth, an architect of the same school, displays the geometrical plans of a pulpit in a florid style, with a conical spirelet over, enriched with bands and carvings. In contrast to this ornateness is a very plain convent chapel at the House of Retreat, Clerkenwell, by Mr. Ernest Newton (1597 and 1603), with an effective and simple tribune partition screen in wood, treated with good taste and reserve. Mr. Charles A. Nicholson, by means of a delightful water-colour, makes a charming subject of but small material in illustrating a design for an organ-case proposed for South Benfleet Church. The organ gallery looks a trifle stilted in proportion, and might have been brought from one of the City churches. The heavily washed Indian-red view, by Mr. J. Mitchell Bottomley, of some Upper Grade Schools, Stockton-on-Tees, makes an unfortunate contrast to the last-named study, and the drawing really fails to do justice to the design. The Universities Mission to Central Africa is to have new premises in Dartmouth-street, Westminster, and for this Mr. G. C. Horsley has made a plain, straightforward, and suitable elevation in brickwork. The plan shows a chapel located cleverly to the rear. The same exhibitor sends a design for a new building in King William-street, marked by a bold oriel bay at the angle. The pleasingly bold, not to say bare, "House at Haslemere," which Mr. Ernest Newton shows, has more character than finish about it, the only detail of any special interest being the plastered projecting bay over the garden door. This has cast enrichments upon it, flatly managed, after the method of old cisterns and stackheads produced in lead. Mr. W. D. Caröe's Adelphi Bank, Castle-street, Liverpool, here exhibited, was illustrated by us in our double number on January 3rd this year. Mr. Charles Spooner, Mr. E. P. Warren, and Mr. W. D. Caröe seem to unite in their appreciation of the large west-window treatment for churches adopted as a personal contrivance or mannerism by the late Mr. J. D. Sedding. The proposed new churches represented by the group of drawings hanging close to each other in the gallery suggest this remark (Nos. 1606, 1615, and 1617). Mr. Caröe's selected design for St. David's at Exeter, represented by the last number, is very well shown by two perspectives. The stone-ribbed brick barrel vault over the nave is broadly composed, and generally the design is massive and effective, having a sort of French tower, with curtain arches spanning the window openings, and the gable over the west front set back behind an embattled parapet—a feature repeated in the flat on other gables. Mr. Edgar Wood sends a quaintly-conceived view of an old-fashioned looking church, oddly drawn with a gabled tower above the crossing, and a timber-built aisle. The proposed church of St. James the Greater at Leicester has a tastefully-designed Classical interior with a florid hanging rood from one of the tie-beams over the nave. Close by is a very suitable Rectory-house at Eccleston, Chester, by Messrs. T. M. Lockwood and Sons, executed prettily in brick. Mr. A. M. Poynter sends a poor design, indifferently drawn, of a country house, and Mr. Wm. Emerson shows the tower from the quadrangle of the Palace for the Maharajah of Bhaunagar, an elaborate rendering of modern Indian building. Another Oriental work is Mr. Beresford Pite's Hospital at Jerusalem. This building has a semicircular courtyard, with radiating wards, which look suitable. Mr. Arthur Keen shows a house at Westgate and some new premises in Bond-street. Tastefully drawn, too, are the picturesque and homely country houses exhibited by Messrs. Bateman (1642 and 1710), and we notice Southsea House, by Messrs. Hall, Cooper, and Davis, erected at Flamborough, and lately illustrated in our pages. We



also recently published Mr. Caröe's buildings in Duke-street, Grosvenor-square (1664). Rowton House, Newington Butts, by Mr. H. B. Measures, is another plain brick building, gabled boldly, and treated with some success. The Flamboyant gates of Albi Cathedral are represented (1670) by a characteristic pen-drawing, by Mr. C. E. Mallows, and Mr. Phené Spiers delights us still with his clever water-colour sketches, as in the little view near at hand (1652), the Koboldzeller Thor, Rothenburg ob. Tauber. Another study of old work deserving of notice is the section of the choir of San Vitale, Ravenna, by Mr. John J. Joass, whose taste and ability as a draughtsman is thereby well shown. Messrs. Gotch and Saunders present by a detailed diagram a new Renaissance house of theirs at Peterborough, which is quietly correct and devoid of fussiness, though the drawing hardly does the work justice. The rich cartoon of the sumptuous design for a memorial window illustrative of "Moses Leaving the Court of Pharaoh," by Mr. Henry Holiday, to be erected in Richmond Cathedral, Virginia, deserves notice for its rich colour and good drawing; but the treatment seems hardly transparent enough for glass. Mr. Andrew N. Prentice has sent a "design for a country house," which strikes us as pretty, though the metalwork finial over the turret makes that feature look rather squat and overdone. Otherwise the work is very reserved and simple. Mr. W. H. Lucas does his cottage at Haslemere sparse justice by the curious pencil drawings 1729; the exhibit is one of those which show a levelling-up of ordinary work generally, as mentioned in our first article last week. The Forest Row Golf Club-house (1708) contributed by Mr. T. Harrison Myres, on the other hand, exhibits what to avoid, and the same remark applies to 1723, a general hall, living-room, and combination parlour, by Mr. R. B. Parker, a restless performance, and suggesting no comfort. Mr. Charles Spooner's little timber-built chapel to the almshouses at Hadleigh, Suffolk, is unassuming, and Mr. Alfred Cox sends a competition design for a memorial hall at Edzell. Mr. Edmund Kirby shows his City Improvements at York, and the buildings designed by him for Duncombe Place, which we illustrated last year\* from this same perspective (1774). It is difficult to discover wherein the merit lies in such drawings as 1785 of Mr. W. G. Scott's Bank at Enfield, and the Hon. A. McGarel Hogg's addition to Saumarez Hall, Guernsey, though more tastefully rendered in water-colour, remains an uninteresting affair. Of the unsuccessful designs for Durham County Buildings two are shown, the better one by Messrs. Prentice and Bolton, the other by Messrs. Clark and Hutchinson. One of the most remarkable exhibits on this wall is the large mansion for Mr. Barney Barnato in Park-lane, by Mr. T. H. Smith. Its size is, of course, considerable—much taller than Lord Lanesborough's and Mr. Alfred Rothschild's houses, with which the building lokes; and its style may be seen by Mr. Oakley's perspective, which we publish to-day. The quaint, long-drawn-out additions to Wye College, by Mr. Paul B. Chambers, is a suitable work, and Mr. Leonard Stokes adds another small Roman Catholic church to his list of seaside mission buildings, this one being intended for Clacton-on-Sea. The Kyrle Hall, Birmingham, in green timber work and red brick, by Mr. W. H. Bidlake, is refined and thoughtful, as might be expected. The Royal Hotel, Weymouth, by Mr. C. Orlando Law, is presumably a competition design, and anyway is a poor, commonplace performance. The new Industrial School for Girls at Ayr is one of the few Scotch buildings shown, and this one is by Messrs. Morris and Hunter. Mr. W. H. Pite's house, called "The Heights," Hindhead, looks better

adapted to a well-wooded site in a valley, and why space should be occupied by such indifferent working drawings as 1688-1689 of a club-house by Mr. E. S. Prior at Aldershot is beyond our comprehension, one being merely a frame filled with plans. The drawers of any architect's office would easily furnish almost any number with this sort of stock-in-trade, and it is a mild kind of scandal that important space should be devoted to the display of such a terrible drawing of so abject a design as No. 1646, entitled an "Institute of Architects." Could the hanger have been a wag wishing to have a sly cut at the folks in Conduit-street? Fancy Mr. MacVicar Anderson, the late President, being regularly skied on the same wall, and this "Institute of Architects" well hung! Reflecting thereupon may the victim exclaim, "Oh that mine enemy would write a book!" an ejaculation which formed the opening sentence of one of his Presidential Addresses, having reference to the question, "Architecture a Profession or an Art?" The choice of drawings gathered together in this gallery this year leaves the query still unanswered.

#### THE SALON OF THE CHAMPS ELYSEES.

THE annual Salon of the Société des Artistes Français, at the Champs Elysées, was opened on the 1st inst., the fashionable "vernissage" taking place the day before.

The Salon of this year is above the average, as far as the quantity of good work is concerned; there are perhaps very few *clous*, such as the "Last Supper," of M. Dagnan Bouveret, or the decorative panels of M. Puvis de Chavannes, at the salon of the Champ de Mars, but nearly every room contains several works of high merit, and the number of very excellent paintings is large. The works of painting hung on the walls of this salon become greater in number every year, and are now almost an exaggeration; this year there are over two thousand paintings, the total number of catalogued works of art reaching to very nearly five thousand. It is, therefore, possible to review here only the most remarkable and interesting of the works of painting and sculpture.

On entering the grand salon No. 16, the attention is at once attracted to the immense canvas of M. Rochegrosse entitled "Human Anguish." The painting depicts a seething and struggling crowd composed of men and women of all classes of society, crushing, pushing, and half-tearing each other in pieces in their frantic endeavours to reach the summit of a precipitous rock dominating an industrial town plunged in half-darkness below. Each struggler has his eyes fixed on the summit of the rock, where may be seen the scarcely outlined shapes of phantom figures which evaporate before the grasp of those, who, by crushing all in their path and clutching any object which may aid them, have reached the highest point of the hill. In the cruel struggle many lose their hold, overbalance themselves, and roll headlong into the sombre abyss, at the bottom of which a cemetery may be seen. The picture portrays the human struggle for life, in which man is surprised by death before he is able to realise his illusions. The work is one full of great power and startling effect, well-composed, and vigorously painted. The colour scale of blue and black is remarkable.

Almost opposite is another very large and striking picture by M. Tattgrain, entitled "Useless Mouths," recalling the siege of Chateau Gaillard at the commencement of the 12th century. The garrison of the castle, finding itself short of provisions, and in the impossibility of feeding the useless mouths of those who could not help in the defence, has mercilessly cast outside the castle walls the aged, the young children, and the infirm, where, to crown their misery, they are driven by the besiegers into the very ditches of the fortress. Here they undergo all the horrors of cold and famine, dig up the snow-covered ground with their hands in the hope of finding something wherewith to appease their hunger, and, failing in this, begin to devour the bodies of their fellow-wretches who have succumbed to exposure and starvation. The work is very largely and vigorously painted; the realism is, however, too horrible, and leaves a deep impression of disgust. The luminous ceiling of M. Maignan, for the Chamber of Commerce of Saint

Etienne, is quite a relief after the above two pictures and their dismal subjects. The panel represents the town of Saint Etienne offering the produce of its industry to France. The principal figures are those of blacksmiths at work with hammer and forge. The life and force of action of these figures have been very carefully studied. In the pearl-coloured background are figures of women carrying arms or casting multicoloured ribbons into space. In the same room is a large picture by M. Thivier, "Mercenaries in the Pass of Hacke": the soldiers, entrapped in the barren passes of the mountains, are dying of exposure and starvation, with no hope of any deliverer but death. M. Surand has a remarkable picture, show the massacre of barbarians by Hamilcar. "The Eagles," a picture by M. Rouffet, depicts the march of a portion of the Grande Armée across the snow-covered steppes of Russia.

Room 14 contains several very good paintings. Mlle. Louise Abbema maintains her prestige with "Perfumes," and a charmingly-painted ceiling subject. M. Choquet has two excellent pictures, a setting sun and a landscape. M. Boggs has a "View of Paris" and "March Storms," painted in his usual and very individual style, murky in colour, but excellent in effect. M. Bonnat has two much-observed portraits—one of M. Ricard, and the other of a lady. M. Buland sends a well-painted picture, full of sympathy, called "The Empty Cradle"—a young couple whose clothing betokens a very humble state of life, seated beside the cradle, which such a short while ago was occupied by the little child which has evidently only just been laid in its last resting-place, for the man and woman, still clad in their outdoor clothes, have just returned from the cemetery, to seat themselves, in sad and silent mourning, beside the empty cradle of the baby they have now buried. The picture is charming in sentiment, and is much remarked.

Room 12 contains a picture by M. Buffet, called "Fête Antique," a painting which will attract attention. M. Benner sends a painting of a beautiful young girl, and M. Jules Breton has a remarkably fine country scene, painted in the clever style of this well-known artist, depicting a group of peasants about to begin their midday meal under the shadow of a haystack.

In Room 10 are two very successful portraits by M. Benjamin Constant—one that of his son André, the other that of a blonde in red velvet dress, seated on an Oriental sofa. M. Bouguereau has two much-remarked paintings in this room; the most attractive, called "The Wave," shows the naked figure of a young girl with delicate flesh and light red hair, cast up by a wave on the beach. The wave is painted with extraordinary transparency; the work is a *genre* painting, with a certain mannerism. The artist has very cleverly given the same value of colour and texture to the principal objects of the picture, the flesh of the young girl, the water, and the sand.

Room 8 holds two clever portraits by M. Barrias; a portrait of M. Brissot, President of the French Parliament, and one of M. Lavedan, by the clever young painter, M. Baschet. Rooms 7, 9, and 11 contain some interesting work. In the last is a view of "Sport," by M. Theodore Weber, a vigorous and conscientiously-painted picture; two small paintings by M. Tony Robert Fleury, entitled "Thais" and "Fantaisie"; also a portrait by Mlle. Turner, a painting which was much admired at the Salon of Lady Artists.

A very strange picture is that of M. Jean Veber in room 13. It is entitled "L'Homme aux Poupées," and shows a tired-looking, worn-out man, whose face already gives signs of death, surrounded by a number of life-size puppets attired in various costumes: one of these is endeavouring to strangle the man, who keeps his eyes fixed on the figures surrounding him, but does not appear to notice the real life in the shape of a naked woman calmly sleeping close beside him. The picture appears to point the moral that man constantly following after his illusions, and seeing but them, ignores the real life close beside him and within his reach, and dies in his error. The picture may hardly be called a pleasing one; there are a number of very evident qualities in the work, but the peculiar subject and the artist's interpretation are not easy to understand. The picture, however, attracts considerable attention. In the same room is a decorative panel by M. Yarz, destined for the town hall of Toulouse, and several excellent landscapes by M. Paul Sain.

Room 15 contains the much-admired work of Mr. Orchardson, R.A., a large picture called "The Young Duke," showing a number of

\* See BUILDING NEWS, Sept. 6, 1895.



gentlemen in wigs grouped around a sumptuous table covered with all the accessories of a feast. The picture is much discussed; the composition is much admired, and the delicately but well-expressed painting of the table accessories found most successful. Mlle. Juana Romani exhibits "Alpine Flower" and "Desdemona," two charming figures of women charmingly painted.

M. Rochegrosse has another important picture in Room 17, entitled "Maitres Chanteurs." M. Story, a young American painter, shows a well-painted interior of a laboratory.

Room 19 is devoted chiefly to portraits. M. Schommer has a group of seven young girls in a garden; the composition is excellent, the attitudes are very graceful, and have nothing of the stiffness so difficult to avoid in family portrait groups. M. Henri Pille has great success with a portrait of Dr. Laffon.

The immense and strange picture of M. Fernand Pelez draws the attention of all in room 21. It is called "Humanity," and depicts a curious mingling of ragged beggars, stout nurses and children, well-to-do citizens, and others, in the avenue of a public park. Behind this strange group is seen the vague form of Christ on the Cross, tenderly contemplating the mingled crowd. The picture is well painted; but it is not easy to make out the intention of the artist, except it be that Christ looks on all with the same tender love, rich and poor being equal before Him. M. Luminais exhibits an admirable picture called "Taken from the Enemy."

In room 25, M. Jules Lefevre has a charming and much-admired portrait of a young girl dressed in white; the lines of the figure are very pure and harmonious.

M. William Dodge, an American artist, has a ceiling panel entitled "Ambition," destined for the Washington Library.

Room 27 contains one of the successes of this year's Salon, "The Hostages," by M. Jean Paul Laurens. Two young boys dressed in luxurious clothing have been taken as hostages, and thrown into a cold, damp prison cell. The younger has fallen asleep on the knees of his brother; the expression of the latter, lost in meditation, and evidently filled with sad thoughts, is very fine. M. Aimé Morot exhibits a very successful portrait. M. Lalrye has a charming picture called "The Wounded Siren," a group of three naked forms of women in the midst of a heavy surf. One of the sirens is holding the body of her wounded companion above the waves, whilst the third is calling for help to the denizens of the sea. The figures are beautifully modelled and painted, the sea's waves are cleverly depicted and very transparent.

A picture showing a remarkable talent is that of M. Luytten, in the grand salon 26 an immense painting entitled "The Struggle for Life." It depicts a miners' strike, a tumultuous and howling crowd of threatening and disorderly men, their fists raised in menacing revolt, their faces convulsed with rage, and their blood heated ready to lead them to any extremity. The picture is a very striking one, and the artist gives evident proof of high talent; the painting is executed in a brutal style well befitting the human tempest depicted; the colouring is intentionally dark and heavy-looking. M. Alvin Correa has a very large canvas representing an episode of the siege of Paris. M. Henri Martin exhibits a very much remarked decorative frieze for the Paris Town Hall. This artist is much admired for his many excellent qualities and his individual style of decorative work; his painting is, however, very much criticised. The lines of the figures are calm, and the colouring very harmonious, but the style of painting is somewhat cold and dry; the portrait figures mingled with the allegorical subjects are well composed, but these forms are too frail and anæmic, and lack life.

In Room 33, Mr. Lorriner has a much-admired portrait of "Colonel Anstruther Thomson," a good jovial-looking old gentleman, hat in hand, his whip under his arm, and clad in velvet breeches, high boots, and sportsman's jacket. Mr. Lorimer, whose works are always very much remarked and admired, and who, French critics prophesy, will become one of the best and most pleasing of English artists, exhibits in the same room a picture called "Mariage de Convenience," which obtains a well deserved success. An interior scene, a half-doubting and melancholy bride, surprised, in tears, by a number of noisy but charming little bridesmaids. The figures of this picture are most cleverly drawn and painted; the sentiment is somewhat theatrical, the slightest

accessories of the room are painted with great delicacy and good taste, and the lovely landscape perceived through the open window is charmingly indicated. Mr. Lorimer is an habitual sender to the Salon, where his works are always much admired; but never has he shown such masterly power and brilliancy of execution as in his picture of this year; his praise is in every mouth. M. Luigi Loir has a well-painted scene of the old iron market held on one of the Paris boulevards.

M. Franc Lamy takes the honours of Room 35. One of his pictures is a very fine study of the nude, the figure of a young girl among the river-side willows. The other is a charmingly composed and painted study of spring colours—two young women and a little girl in a boat, gliding slowly over a lake coloured by the rays of sunlight passing through the thick curtain of overhanging foliage. A fine portrait of a young girl, by M. Lobrichon, attracts much attention.

M. Chocarne Moreau, with his charming picture called "Opportunity Makes the Thief," in Room 38, continues his charming series of pictures with amusing subjects. This year, his pastrycook's boy, neat and clean in his white apron and cap, his open basket of good things under his arm, is earnestly gazing at some illustrated paper exhibited in front of a paper-seller's kiosk, two young chimney-sweeps, covered with soot from head to foot, and forming a striking contrast to the white costume of the pastrycook, are taking the opportunity of quietly stealing one of the tarts most temptingly exposed in the open basket, whilst the pastrycook's boy is too deeply engaged in admiring the illustrated paper to notice what is going on by his side. M. Chocarne Moreau is a great favourite with his amusing and well studied episodes of "gamin" life.

"The Municipal Council of Landsberg," by Prof. Herkomer, R.A., in room 40, is very much admired for its solid and masterly style of painting. It depicts a meeting of the robust-looking Landbergers, seriously attentive to the business which has brought them together in the large oak-panelled hall, through the open window of which a view of the ancient town is visible. It was hung at the Royal Academy last year. The bright compositions of Mr. Fantin Latour always enjoy the greatest success. This year his two pictures, "La Toilette" and "Venus et les Amours," are, as is always the case, charming in colour and composition. This artist has also a very much remarked picture of Eve, in the section of lithography. "The Last Rays," a lake scene, with half-nude female figures in a boat, delicately lighted and coloured, by Mr. Saul Chabas, is much admired.

The wonderful landscapes of Mr. Harpignies in room 36 are masterpieces, despite the great age of the artist, whose work maintains in every way his masterly power and individuality. His fine picture of the Loire is severe, but at the same time, full of poetry; a view of the fine river flowing through rich meadow land. The sensational picture in this room is "Christ in the Shroud," by M. Henner. This painting must be seen to be understood and appreciated. No written idea can be given of the beauty of the work, or explanation made of the emotion and impression of mystery left by the eloquence of the picture. The body of Christ lying on the shroud is firmly treated, and beautiful in line and contour, the colouring is rich and wonderfully luminous. A portrait of M. Carolus Duran, by the same artist, is painted in a masterly style. Two portraits by M. Ferdinand Humbert, that of Mlle. Heglon, and that of a lady in ball-dress, are masterpieces of free and bold execution. A large number of some of the best of the exhibits in the many rooms have inevitably been passed by. English and American Art is well represented; their works go far towards the success of the Salon. Besides the names mentioned above, there are those of Mr. W. G. Joy, with a painting of "Jeanne d'Arc," represented by an engraving by Comfort in this year's Academy; Mr. Harcourt, "The Thought-reader"; Mr. Melton Fisher, with "A Night at Venice"; the landscapes of MM. Picknell, Titcomb, Corbett; "The Infant Jesus" of Mr. Gotch, besides others much remarked and admired. In the section of Sculpture M. Falguière is to the fore with a "Danseuse," a nude, which will enjoy a great success. The figure is possibly a portrait; but in any case is a perfect study of the nude, and might almost have been taken in cast from the body of the model, if the wonderful talent of M. Falguière did not make the idea an absurd one. M. Fremiet is very successful with a "Saint Michel," and with also a small bronze of a

cat stealing a chicken, a perfect piece of realism. M. Gustave Michel exhibits "The Blind Man and The Paralytic," a remarkable work carved in coloured stone. The sculptor might have been bolder, and pushed to a further degree of polychrome sculpture, the realism of his subject permitted him to do this. M. Mercier has a group "For Honour's Sake," destined for the town of Chateaudun. The group is full of life and dramatic sentiment. "The Merchant of Ancient Gods," by M. Cordonnier, "The Draught Horses" of M. Tourganoff, "The Panther" of M. Gardet, "The Weeping Rock" of M. Henri Lemaire, and "A Great Secret," by M. Pech, are all works well worthy of remark.

The section of Art Objects is perhaps not all that its organisers intended it to be. The exhibits comprise either luxurious objects of skilful workmanship, coming from some of the best-known Parisian industrial ateliers, or very small exhibits of carved work, perfectly fit for the sculpture garden. There are, however, a few interesting objects which deserve attention.

The section of Drawings and Water-Colours is not very rich this year. There are, however, some interesting works by MM. Fantin Latour, Baschet, Cormon, Cesbron, Checa, and Lockhardt.

The section of Architecture is interesting, but like that of the Champ de Mars, must be left for further notes. ARTHUR VYE-PARMINTER.

#### THE DEFICIT AT THE INSTITUTE.

THE meeting held on Monday last to consider the yearly report of the Council was not numerously attended, and the serious mood of those who engaged in the discussion was but sparsely enlivened by the few sallies which passed now and again between the defenders of the council and its accusers. It is a trite saying that "those who look on see best of the game," and perhaps the most encouraging feature in the proceedings here to be recorded consisted in the unreserved manner in which the chairman, Mr. Aston Webb, vice-president, explained the main points complained of by Mr. Woodward relative to the finances, and the fair and capable way in which he managed the meeting also deserves to be noted. The most regrettable circumstance apparent is the significant apathy and lack of interest displayed by the majority of members of the Institute in its affairs, seeing that they were conspicuous by their absence.

That the Council as a body are above reproach was not questioned; but the recurrence of a deficit in the yearly statement of accounts naturally enough became the subject of some comment, and very fairly constituted a matter upon which more information was demanded. Whether or not the method adopted by the hon. auditors in making their report was the most appropriate and judicious, it seems a pity that their statement was not printed, so that all the members might study the figures for themselves, even although it be taken for granted as a matter of course that the official income and expenditure account prepared by the chartered accountants is absolutely correct. The chairman expressed his anxiety for every inquiry, and secured an impartial hearing for all who had anything to say on the subject; but it must be evident that the most complete justification of the action of the Council in conducting the affairs of the Institute would be secured by the publication of Messrs. Todd and Woodward's criticisms alongside with the explanations which were called forth by Monday's debate; and, indeed, it is a matter for doubt if the particulars thus furnished would have been afforded at all had not the issue thus been raised. Mr. Wm. Emerson, the secretary, warmly expressed his disapprobation of the auditors' conduct—well assured of the rectitude of his own, and other members of the Council naturally contended for the official view of affairs. The most amusing incident to the on-lookers was the new guise in which Mr. Beresford Pite appeared as spokesman, *par excellence*, for "the powers that be," whereas but a few years since the rôle in which he never failed to secure prominence was that of attack, retrenchment, and reform. Mr. Woodward played off a Roland for Mr. Pite's Oliver, without, however, furthering the matter in hand. This mainly was one of adjustment of figures which, grouped one way or the other, displayed a balance on the wrong side. This downgrade, apparent on the surface, has been due to a variety of causes, and, among others, to profitless law charges, unavoidably incurred—because we have the best possible assurances of the chairman



that it was so—in disputes about the Maddox-street and Conduit-street Galleries being let for purposes not originally contemplated; by costs incurred in resisting the adoption of the Architects' Registration Bill, in accordance with the vote of the Institute; in registering the copy-right of papers read at the meetings; and in preparing a deed of trust in conformity with the conditions made by the Duke of Devonshire when he presented the Institute with the magnificent Chatsworth collection of Inigo Jones' drawings—the last named item, a very necessary and well-advised outlay which it would be folly to dispute. Then, again, the expenditure of several thousand pounds in altering and improving the Institute's premises naturally necessitated a withdrawal of capital, and after all that has been said the actual debts of the Institute amount to less than £400, the estimated balance for the twelve months of 1896 being £185 to the good. The increase of advertisements in connection with the *Journal* for this term has already amounted to £500, and as a saving of £400 has been accomplished in connection with its publication, it is hoped that in future the official magazine will become a source of revenue. The onslaught, if we may so term it, was commenced by Mr. Wm. Woodward, whose figures, in the absence of the text of the auditors' report, were difficult to follow, and it was by no means clear to those who looked for information, that he made out his case against the paragraphs in the annual report of the Council, as to the new form of building agreement and schedule for building contracts, and the correspondence in progress between the Council and fire insurance offices, the negotiations not being yet completed. As to the building contract forms, it seems that within the few months since they were published no less than a thousand copies have been purchased, and from the remarks of several speakers these agreement forms must be really much used and appreciated. With reference to the fire offices, Mr. E. A. Gruning, no mean authority, pointed out the inadvisability of publishing imperfect accounts of an incomplete negotiation. Mr. Woodward scored a point in a way later on, however, over the official plan of the Strand and Holborn street-improvement, seeing that it had been sent to the County Council as the Institute's plan without the members of that body having been allowed to see it. Mr. Forster Hayward supported the inconvenience of such a proceeding, and the chairman undertook to recommend the publication of the plan in the *Journal*, stating, at the same time, that the County Council were favourably considering its proposals, and were not unlikely to advise its embodiment in the ultimate scheme. Mr. Woodward thought the Art Committee had done wisely in making no reference to the premature endeavour made by the Institute to dictate to the committee of a church competition in Exeter as to the course of action proper to take in upholding Mr. James Brooks's award in favour of Mr. W. D. Caröe's design. The aim of the letters thus referred to (see *BUILDING NEWS*, Feb. 14 last) was, of course, a proper one, and there is no doubt whatever that Mr. Caröe's design (now at the Royal Academy Exhibition, 1617 in catalogue) was the best plan; but a precipitate interference with a matter of this character "is likely to convert a building committee into ardent champions of the local architect, entirely without regard to any artistic merits his design may or may not possess." The odd point is, that when an assessor nominated by the Council of the Institute is by notoriety known to have violated his own printed instructions to the competitors in a competition in which he has thus made an award, no such zeal is forthcoming on the part of the Council, and no letters appear endeavouring to secure justice as between the parties. At Conduit-street an assessor's infallibility is invariably upheld against all comers, though some of the present members of the Council can remember instances in which they were personally concerned which well demanded revision.

The other speakers at Monday's meeting who supported Mr. Woodward were Messrs. Fredk. Todd, G. A. T. Middleton, H. H. Langston, and R. Williams. On the other side, besides those already named, Messrs. E. T. Hall and J. Slater took part in the discussion. The amendment to the adoption of the report was proposed and seconded by the two auditors to the effect that a committee of inquiry be formed composed of four members of the Institute nominated by the meeting, and four nominated by the Council to consider and report on the

financial condition of the Institute. Fourteen voted for, and a considerable majority against this, so that it was lost. The yearly grant of £100 was unanimously voted to the Architectural Association, Mr. Beresford Pite, the president-elect of the latter body, declaring that the life of the Association depended entirely upon the Institute, for whose examinations its students were almost exclusively engaged, therefore this grant was of vital and mutual importance. After this speaker's attitude only a year or two since about the absurdity of examining a man in architecture, and his coquetting with those who refused to have anything to do with the teaching of the A.A. classes unless the ultimate goal of examination was expunged entirely from the curriculum of that body, this assertion comes with a degree of inconsistency which only those who know may be justified in considering characteristic. The Council's annual report was carried with one dissentient. On the proposition of Mr. John Norton, Messrs. Woodthorpe and Owen Fleming were appointed auditors for the coming year. As the report of the Council is issued as a "confidential" paper, its text must be considered private. Suffice it to say that no special advance has to be recorded. We venture to think that if Mr. Aston Webb were elected President a marked improvement would before long be made manifest, and a greater interest evoked in the Institute's affairs and its proceedings. It is badly wanted while things are approaching the down grade.

#### "BUILDING NEWS" DESIGNING CLUB.

A BLOCK OF STABLES AND COW-STANDING.

THE accompanying illustrations show the first two designs in this competition. No. 1 is by "Tadpole," No. 2 is by "Koh-i-Noor," and No. 3 is by "Owl." The following are the instructions issued for the guidance of the competitors:—"A Block of Stables and Cow-Standing, adapted for erection in connection with a small country house in a stone district. Provide five stalls, two loose-boxes, a washing-standing, harness-room, and man's bedroom over it; a coach-house for four carriages, and a hay and corn loft. The cowshed for four cows and a small calf-standing to form part of the quadrangular block of buildings, and a small stock-yard attached to it looking away from the stable yard proper, and towards the paddock. The buildings to occupy three sides of the little quadrangle. Slate roofs and stone walls. Scale, 8ft. to the inch, and plans may be drawn 16ft. to the inch; view essential. Site a level one, facing south." The simplicity of the selected design is no small recommendation, and it looks like the kind of vernacular work such as one would expect to find in a stone district, though we miss those incidental touches of detail which the artistic hand of the tasteful architect might be expected to introduce to add grace of form, in avoiding baldness, and increasing the interest of the building without violating its breadth and sturdy homeliness. "Koh-i-Noor" is less severe; but his plan is not so good, and there is more attempt at mere quaintness, which is best avoided. The stock-yard should have been large enough for the four cows, and was not intended merely for the calves, as here contrived. "Tadpole's" plan would have been improved by placing the calf-standing at the end of the byre, and adding a small yard alongside the larger one. The cramped look of "Koh-i-Noor's" stable is partly due to the prominence given in the drawing to the surface drains. "The Owl's" stable is not good, and windows at the head of the horse's mangers cannot be approved. His cow-house is really better than either of the two first named, and he has a double yard such as we have indicated above; but we do not like his elevations. His intention, we can see, has been to keep their appearance somewhat in evident harmony with a villa-like house, fearing, perhaps, a farmyard type of building, and so the element of prettiness has governed the composition too much, and given a thin effect, which spoils its success. "Brian" has several good points, and with plain methods has grouped his buildings pleasingly in a suitable way, showing no little skill. The coachhouse is too confined, tucked away behind the washing space, and there is a lack of roominess generally in his plan. "Invicta" may be congratulated, too, on his contribution, which would have looked more effective had the lines of his drawings been firmer. The rules do not permit more than one sheet for the illustration of a design, and so

"Invicta" has lost some points by employing two pieces of paper. His plan has received no little study, and would make a useful building. The design, however, is not influenced by the material, and would for that matter do equally well in brick. Of course, "Tadpole's" design could be constructed of brick; but, for all that, the treatment naturally suggests stone. "Thistle" cramps his stable-yard, and makes a stock-yard of very small proportions: otherwise the plan is not bad, and has the merit of economy. The washing-standing is in the wrong place at the end of the cow-byre. "A. B. C." draws badly and plans indifferently, with little knowledge of the subject; but he displays a sense of the architecturally picturesque which ought to develop. At present we can only advise the author to obtain technical familiarity with building, and learn to draw so that his designs may be expressed with intelligence and correctness. "Tommy Atkins" sends a barrack-like stable, which is not devoid of practical utility; but the architect should strive to elevate his work above the bald level of the merely utilitarian. "Mac" makes an endeavour in this direction, but fails for lack of a keen sense of good proportion, and a disregard for the value of plain wall surfaces. "Mandalay" comes next, and is neat and careful, giving us a top-lighted stable and cow-shed which would serve its purpose, but hardly with a pleasing appearance or special adaptation to a stone-building district. "Pickwick" introduces half-timber work, giving us a fairly compact plan, quaintly contrived without an adequate effect externally. "Lancastrian" is needlessly bald, presenting a group of buildings without any character beyond the elementary outcome of builders' work. Both the shippin and the stable have hay-lofts over; but for so small an establishment this is hardly desirable. The whole thing seems better adapted to a farm, instead of an accompaniment to a gentleman's house. "Carliol" cramps his byre awkwardly, and reaches his stable very inconveniently, the only approach being through the washing space. The view gives a very uncanny look to the place, quite devoid of homely interest. "Como," in some ways, is better, but more pretentious with the embattled tower and stair turret. The birdseye perspective is the best part of the contribution. "Giles" is Georgian or Dutch Classic, and very poor at that; handled with little knowledge either of construction or architectural fitness. The faced ashlar bands intersected by vertical pilasters makes a distinctly timber treatment, for which, possibly, an old example of 18th-century work might be found; but it is unworthy of imitation, and "Giles's" plan is utterly bad. "Pantile," after this remark, may fancy we place him low in the scale. His elevation has merits hardly done justice to by his drawings. "Moor" makes a jumble, and fancies it a group of buildings; but, as a beginner, he has time before him in which to improve. Study architects' work. We have often published good men's designs for stables and other small buildings, and these are worth keeping for reference. "Oberon" comes down in the list, notwithstanding his care and neatness. The perspective shows a sort of model farm of no attractive appearance. "Fac et Spera" is inky and over-elaborate, inconvenient and ill-considered. Pen-and-ink drawings should not be made on rough water-colour paper. "Boer" is more reasonable, but his perspective gives a very false notion of his design, and if set up from the plan, was mismanaged. "Venus" is a little better this time; but the sketch of one angle is not, rightly speaking, a view such as we stipulated for. "Mannikin" comes next, and then "Fear," for whom we have no word of praise. "Kafir" and "Una" complete the series in *equilibrium*.

#### AN ARCHITECT'S CALL AT THE INSTITUTE OF CLAYWORKERS.

LAST Friday, the day following the annual meeting of the Institute of Clayworkers, Mr. H. Greville Montgomery invited a number of architects to call at the rooms of the Institute at 222, Strand, to inspect the numerous specimens of British and foreign bricks and clay-ware on view there. Many took advantage of the opportunity, and were much interested, and in several cases inquiries resulted which will lead to business. Architects generally would do well to drop in at the Institute of Clayworkers occasionally. They will find Mr. Greville Montgomery or Mr. Geo. Callender always ready to give



information, and it must be a very recently introduced or very little called for brick or piece of pottery that these gentlemen cannot put an architect on the track of.

The room is furnished with the records of a number of results of crushing tests and other experiments, and there is quite a representative collection of Danish, German, Canadian, British Columbian, and Belgian bricks. Even the Salvation Army is represented by some specimens made at the Hadleigh Farm Settlement.

Among the English exhibits, Messrs. Carter and Co. have a fairly representative show of their admirable specialities in the way of geometrical, encaustic, mosaic, glazed, enamelled, and hand-painted tiles and faience. Some of the latter cannot be too highly commended for its colour and evenness. A very quaint but altogether satisfactory reproduction of a Moorish tile is worth attention. The Brockham Brick Company have some good samples of rubber, machine-pressed, and washed gault facing bricks. Messrs. Candy and Co., of Newton Abbott, show some of their capital white and coloured glazed bricks. The Self-Locking Roofing Tile Company contribute specimens of their sand-and-cement tile, which at once commands attention by its lightness and effectiveness. Messrs. S. and E. Collier, of Reading, the well-known makers of the celebrated Reading red tiles, challenge comparison by any with their red ridge tiles and finials, and terracotta in buff and red. Messrs. Stanley Bros., of Nuneaton, are to the fore with their proverbially excellent blue building and paving bricks. No architect should neglect the very superior quarries in red buff and chocolate they make for churches and entrance-halls. For a good bright-red facing brick at a reasonable price, hand-made, and well finished, and exhibiting all the bloom of a sand-faced brick, Messrs. Thomas Laurence and Sons, of Bracknell, are hard to beat.

Many other specimens are on view which space prevents us from mentioning.

#### NOTES ON DOMESTIC DRAINAGE.—XIII.

##### BATHS.

**F**REQUENT bathing of the body is often looked upon as a luxury, instead of constituting a material factor in the maintenance of personal health; but of late years its hygienic importance has been more fully realised, with the result that public baths and bathing-places are now established in all our crowded cities.

A simple and sanitary form of bath is, or should be, a necessity in every house. In this connection it may be mentioned that some years ago the governing body of the City of Baltimore passed a law, making it compulsory to provide a bath-room in all domestic dwellings which should be erected in that city, from the costly mansion down to the small cottage of the artisan.

The general arrangement and details of construction of baths depend in a great measure on the particular uses for which they are required. For medical and other purposes special forms, such as "needle" - baths, "sitz" - baths, "vapour" - baths, &c., are frequently used; but for ordinary domestic requirements the *plunge* or *slipper* bath is almost universally adopted, though sometimes it may be fixed in combination with a water-spray apparatus, so as to give a douche, spray, wave, or shower bath when desired.

A well-designed and properly-constructed *plunge*-bath should fulfil the following conditions in order to afford an adequate measure of sanitary efficiency, viz.:—

1. The material of which the bath is made should be perfectly smooth and impermeable, and contain no angles or corners for the retention of dirt or soapy matters.
2. The waste-pipe must be entirely disconnected from the drain, and securely trapped close to the outlet of the bath, whilst the trap should be of siphon form, with a good water-seal and thoroughly self-cleansing. An anti-siphonage pipe should also be fixed near the top of the trap.
3. Every portion of the bath and its fittings should be visible and easily cleansed, no portion of the overflow and waste pipes situated on the *bath* side of the trap being concealed or inaccessible at any time.
4. The water supply to the bath should be completely disconnected from the waste and overflow pipes.
5. The waste-pipe should be as large as practicable (about 1½ in. or 2 in. diameter), so as

to afford a "quick" waste for flushing the drains. The overflow pipe should be large enough to carry off all the water discharged by the supply-valves when turned on full bore.

6. A properly-constructed safe (discharging into the open air) should be provided. Plunge-baths are usually made of slate, porcelain, marble, zinc, cast iron, or copper. An absorbent material like wood is, of course, quite unsuitable.

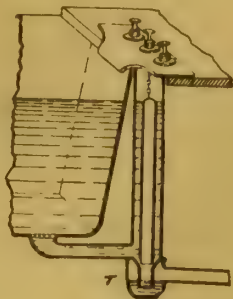


Fig. 64.

Slate baths generally consist of planed and enamelled slate slabs bolted together, the joints being made with red-lead. Such baths possess too many objectionable angles and corners to be satisfactory.

Porcelain or fireclay, when well glazed and without flaw, provides a thoroughly impervious material with a perfectly smooth and even surface. Owing to the thickness of material necessary for strength, a great deal of heat is absorbed from the hot water when a warm bath is required. They are expensive in first cost, extremely heavy, but when fixed are most cleanly and lasting in wear. They should only be used where an ample supply of hot water is available, so that the bath may be well warmed before use. In cold weather the temperature should be raised gradually, in order to avoid any risk of fracture.

Marble baths are cut out of the solid block, and afterwards polished. For ordinary purposes they are prohibitive in price, and have no sanitary advantages over those of well-glazed porcelain. Like porcelain, they are very heavy, and absorb a great amount of heat from any warm water contained therein.

Zinc baths are sometimes fixed where economy in first cost is necessary; but they are unsuitable for general use, as they soon become worn out.

Enamelled cast iron is the material most commonly used for baths on account of its comparative cheapness. So long as the enamel remains intact a smooth impervious surface is obtained; but should it become cracked or chipped, the exposed surface of the iron rapidly oxidises, the bath

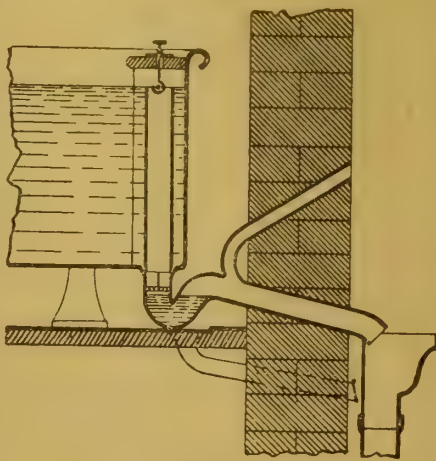


Fig. 65.

being perforated by the rust, and so rendered unserviceable. The cheaper descriptions are either painted with enamel paint or japanned; but where cast-iron baths are adopted they should be "porcelain enamelled" with a good smooth surface, and free from all cracks or other flaws.

Sheet copper forms an excellent material for baths, and is very durable. It is not liable to rust if the surface of the metal is exposed through any wear or scratching of the enamel.

Being also of comparatively thin substance, it absorbs but little heat from any warm water contained by it. When this material is used, the bath should be constructed of stout hammered copper, weighing not less than 32oz. per foot super., with good lap, welded and brazed seams, the ends and bottom being rounded, and the whole well tinned and enamelled.

Plunge baths may be obtained with tapering or parallel sides, and of sizes varying from 5ft. to 6ft. in length. The average internal dimensions of what is known as a "full size" bath are as follows:—Length, 5ft. 6in.; breadth at head, 2ft. 1in.; breadth at foot, 1ft. 8in.; depth, 1ft. 10in. The comparative weights of a full-size plunge bath of different materials is given in the following table:—

AVERAGE WEIGHT OF A FULL-SIZE PLUNGE-BATH.

Description of material.	Weight.
Sheet copper .....	76lb.
Enamelled cast iron .....	300
Slate .....	500
Porcelain .....	500
Marble .....	600

Whilst with but few exceptions nearly all baths are now made with rounded angles and corners, yet the great majority of them, as at present constructed and fixed, do not provide that degree of sanitary efficiency that might reasonably be expected. The greatest defect is usually found in the arrangement and method of fixing the waste and overflow pipes.

One of the most popular, and at the same time—from a sanitary standpoint—objectionable arrangements is that known as a "secret" or "concealed" standing overflow and waste, the general form of which is shown in Fig. 64. The bath waste is trapped as shown at T, the inlet of

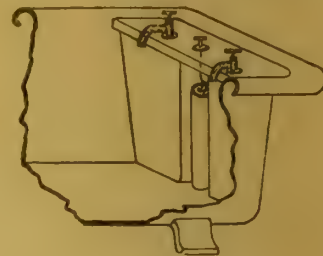


Fig. 66.

the trap being tapered in order to provide a seating for the standing overflow pipe, which is capable of being raised or lowered at will by means of a small knob or pull. Should the standing overflow pipe be raised, the water is free to escape through the trap and waste-pipe; but when resting upon its seat the contents of the bath are retained until the level of the top of the standing overflow is reached, the surplus water then passing down the overflow pipe and so through the trap below. The standing overflow being thus made to act as a plug to the outlet of the bath, it will be observed that on every occasion when the bath is used, the annular space between the overflow pipe and the tube containing it must, of necessity, fill with water to the same level as in the bath. After continued use, the surfaces of the annular space—together with that portion of the waste-pipe between the plug and the bath grating—become fouled with soap, grease, dirt, &c., the whole being either out of sight and inaccessible, or so inconveniently arranged that they cannot be properly cleaned. The air of the bathroom is consequently liable to become vitiated by the gases generated and given off from the decomposing organic matters. At the same time, whenever the fitment is used, the clean water entering the bath becomes more or less contaminated by the decomposing matters adhering to the soiled surfaces of the concealed overflow chamber and the waste-pipe. It may be readily imagined that in the case of certain contagious diseases the indiscriminate use of a bath of this description might be attended with serious consequences. It should also be noticed that the drip form of trap shown in Fig. 64 is not a thoroughly self-cleansing type of trap. A simple and good arrangement is shown in Figs. 65 and 66. A self-cleansing siphon trap is fixed immediately under the bath outlet; the bath plug takes the form of a standing overflow placed in a small open recess at the foot of the bath, and can be raised or lowered by means of a small lever or knob. The combined plug and overflow may be instantly unhooked at the top and



thoroughly cleansed when necessary. By this means every portion of the bath and its fittings are so designed as to be visible and accessible at all times, whilst the overflow-pipe, being placed in the small recess, occasions no inconvenience to the bath.

In some districts the use of a standing overflow to the bath—whether visible or concealed—is not

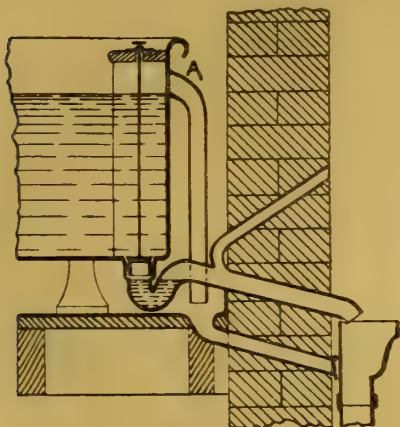


Fig. 67.

permitted by the regulations of the water company. Under such circumstances, it is generally compulsory that the bath overflow shall not in any way be connected or discharge into the waste-pipe from the bath, but shall be carried through an external wall as a warning pipe and discharge in some conspicuous position, in order to prevent any waste of water taking place through the overflow without being noticed. The outer end of the overflow should be provided with a brass or copper hinged flap-valve, whilst the outlet from the bath may be arranged with a movable grating or other device, so that the whole length of the pipe may be easily cleaned. As all baths should stand upon a properly constructed safe or tray, the overflow-pipe, instead of being carried through the wall, may discharge over the mouth of the waste-pipe from the safe, the outer end of the safe waste being fitted with the usual flap-valve. Fig. 67 is a sketch showing the method of fixing a bath so as to comply with these conditions. The bath outlet is provided with a solid pull-up waste in a small open recess; but an indiarubber or brass plug with chain may be substituted if desired. The lead safe under the bath is constructed in the same manner as already described for water-closets. If the bath overflow grating cannot be removed for cleaning purposes, a brass screw cap might be provided to the overflow pipe at A (see Fig. 67).

The hot and cold water supply should discharge over the edge of the bath, or, at least, above the

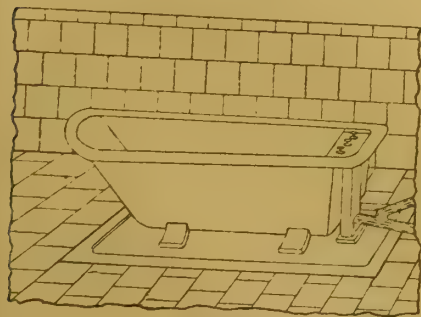


Fig. 68.

overflow level of the bath. It may be observed that, according to the London Metropolitan Water Act of 1871 it is required "that the outlet shall be distinct from, and unconnected with, the inlet, or inlets; and the inlet, or inlets, must be placed above the highest water-level of the bath." By this means any possible contamination of the water supply is reduced to a minimum. At one time it was a common practice to admit hot and cold water into the bath through the same orifice as that used for the outlet of the waste-pipe. Such an insanitary arrangement should not be permitted, for particles of soap, grease, and other impurities are from time to time deposited on the interior surface of the pipe common to the waste

and water supply, a great portion of which is returned to the bath on each occasion that it is used. On hygienic grounds it is desirable that the bath should be quite uninclosed, with sufficient space between it and the walls to allow of every part being readily cleaned (see Fig. 68.) The upper part of the bath should be formed with a rolled edge. The floor of the bathroom should be laid with mosaic tiles, or other non-porous material, the bath standing within a properly constructed safe, which may be of slate, marble, glazed earthenware, or tiles. The safe should be provided with a 1½ in. diameter waste-

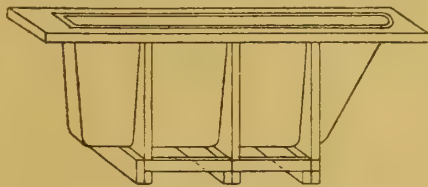


Fig. 69.

pipe, discharging into the open air, the outer end being provided with a flap valve. Where no bath inclosure is fixed, the exposed supply pipes, waste pipe, &c., may be of polished brass. If the bath is made of thin sheet metal, it must be supported with a wooden framing or "cradling," so as to prevent the sides and bottom being forced out of shape when in use. It is, then, necessary to fix a wooden inclosure to the bath for the sake of appearances, and in such a case, the safe should cover the whole of the floor surface within the inclosure. Fig. 69 is a sketch of the cradling as usually fixed.

#### PHYSICAL EXPERIMENT AND ENGINEERING

THE "James Forrester" lecture for the present year (the fourth of the series) was delivered at the Institution of Civil Engineers last (Thursday) evening by Dr. Alexander B. W. Kennedy, F.R.S., member of council, who took as his subject "Physical Experiment in Relation to Engineering." Mr. J. Wolfe Barry, C.B., Vice-president, occupied the chair. Dr. Kennedy remarked that there was perhaps no science, except those in the biological group, of which it might not be argued, with some degree of plausibility and reasonability, that the engineering profession was a direct application. The sciences of mathematics and of physics, of chemistry and of geology, concern themselves with the exact statement of the nature and relations of facts and phenomena with which engineers have continually to concern themselves. But the point of view of the purely scientific investigator and of the engineer, in regard to these facts and phenomena, are very different. In rare and exceptional cases, one man can play both rôles, but this happens so very seldom that for all practical purposes they may be regarded as distinct from each other. And no one who is not terribly narrow would deny that either might form a worthy life-work for any man. Physical experiment, so far as it has relation to the engineering profession, serves three distinct purposes. In the first place, from the purely academic or educational point of view, it is most important and helpful in the training of engineering students. Then, secondly, what may be called purely physical experiment is necessary to supply most of our most important constants, whether connected with the thermal properties of steam, the electromotive force of a Clark cell, the density of water, the elasticity of steel, or the coefficient for a *vena contracta*. Lastly, technical experiments, which are essentially physical experiments, but of a much more complex nature than those of the physical laboratory (although not on that account more difficult to carry out) are necessary for determining many matters; such, for example, as the efficiency of a dynamo, the steam consumption of an engine, the flow of a river, the resistance of a ship, or even the deflection of a girder under a moving load. Let us consider, in the first place, the purely educative or academic type of experiment. Here the first requirement is the very simple one, that the student should learn first to see and to measure, and then to write down what he has seen and measured. The experiments require to be, as far as possible, quantitative rather than merely qualitative; but, otherwise, the simpler they are the better.

So far as concerns the training of the faculties of observation, probably chemical experiments would serve as well as physical. In certain respects possibly they might even be better. An important point is that in their earlier stages the student should not be allowed to get the notion that his experiments are more than rough exercises. Any standard of accuracy which he can possibly attain is comparatively a very low one, and the experiments he can do must be simplified down enormously before they can be put into his hands, so that at best he is only making a rough determination of one element in an artificially simplified operation, the full conditions of which he is not even in any position to understand. The actual figures which are obtained by him cannot be regarded as having any intrinsic value; and one of the difficulties of the case is to persuade the student to exercise his highest degree of care in obtaining results which at the same time he is told, or knows, are of no use whatever. More interesting than this purely academic matter is the consideration of physical experiment under the last two headings mentioned. First among these comes experiment which really belongs to pure physics, but in which we engineers may claim to be as much, or even more, concerned than the physicists. The whole of our interest is practically concentrated on what constitutes only a small part of the boundless region open to the physicist. We can never stray far from a limited number of matters which concern what are contemptuously called "technical materials," and with these materials only in states in which we can readily obtain them. In fact, nineteen-twentieths of our liquid and gas problems affect only liquid and gaseous (or vaporous) water, and only the remaining small percentage is left to be distributed between coal-gas and producer-gas, liquid carbonic acid and anhydrous ammonia, and so forth. Then, again, we have a first interest in certain physical results, because of the extraordinary frequency with which we have actually to make use of them. Having this knowledge of results, we are compelled to make such continual use of it that we are more familiar both with the figures concerned and with the phenomena which they represent, than even the men to whose accuracy and diligence we owe their original investigation and determination. I refer to such results as the thermal relations of water and steam, to the calorimetry of fuels generally, to many hydro-dynamic problems, to most problems in elasticity and what is clumsily called the strength of materials, to frictional questions, and to innumerable problems relating to electrical matters. But we must look at the other side of the matter. We engineers may have more interest in these matters than anyone else, but it is true that we have not ourselves to thank for the determination of the results which we require, and which we make so much use of. For the whole of these results we are indebted to workers in physical science pure and simple, men without the least suspicion of technical or utilitarian intent. It would, therefore, ill become us to say or do anything which should indirectly tend to belittle the work of pure physicists. A physical experiment, such as is necessary for the determination of any one of the physical constants which we have in continual use, differs very essentially from such physical experiments as we engineers have to carry out in the course of our own work. It is at once much simpler and much more difficult. It is simpler because its object is the solution of one certain problem, which has been by much care and pains isolated from all related and adjacent problems. The first work of the physicist, dealing with his problem, is to find out a way of so isolating his question, that its solution may give him exactly the one quantity he wishes to know and no other. In a physical experiment of this category, the primary points are first, that the object of the experiment should be single, definite, isolated, separable and separated from all surroundings—secondly, that it should be general in its nature, and should not relate merely to one special case; next, that as a problem it should be capable of exact determination; and lastly, that the final result should be as nearly absolutely accurate as it is possible for any physical determination to be. Take as examples such matters as the determination of the density of steam, of the variation of the specific heat of water with change of temperature, of the calorific value of pure carbon, or of the mechanical equivalent of heat. Such problems properly stated admit each of one exact solution, one answer which is absolutely right,



even in the mathematical sense of that phrase. It is the highest object of the physicist, in dealing with such a problem, to obtain this right solution. Physical experiments in the third category—the technical experiments which engineers have actually to carry out—do not fall under a single one of the conditions just given as characteristic of experiments in pure physics. The conditions under which engineers have to carry out physical experiments vary greatly. In certain simple cases they are essentially physical investigations, be it in connection with friction or with elasticity, which at first sight do not greatly differ from the experiments just discussed. There is, however, more difference than appears at first sight, although the spirit in which both sets of experiments have to be made is the same. Take, as an example, the determination of the elastic modulus (or the specific extension) of a piece of steel. Probably, with very perfect instruments and with extreme care in manipulation, a value of the modulus could be obtained which should be accurate—say, within 1 in 2,000—for that particular piece of steel. But a figure so obtained would not be accurate even for other pieces of steel made at the same time, and out of the same ingot, as the one experimented upon; while there is no one absolute value for the modulus of elasticity of the widely-differing material of which all sorts go by the name of steel. Under such conditions it would be mere affectation, and, in addition, would be actually misleading, to claim anything like physical accuracy for our results. Further, the truly scientific way of treating an experiment in engineering physics is to recognise from the outset its limitations as to accuracy, and to be careful not to state a final result in a form which should lead to the supposition of any greater degree of accuracy than that which the conditions of the work can actually allow. The difference between physical and technical experiments may easily be illustrated by another example from the region of elasticity. The determination of the deflection of a beam, transversely loaded, as a physical experiment would resolve itself into the test of the behaviour of a piece of homogeneous material, preferably of the simplest possible cross-section, probably rectangular. It would be a matter of importance to insure that the material was exactly of a certain chemical nature, and that it was mechanically free even from the slightest defects; it would also have to be machined to certain exact dimensions. As a technical experiment, on the other hand, the beam might consist of plate and angle-irons secured together by rivets, the whole forming a structure with absolutely no pretence to homogeneity, nor to absolute exactness of dimension. Its rough surface would be carefully left intact and not in any way machined, its riveted parts would be brought together as well as was reasonably possible with the appliances at the command of the engineer, but without any attempt to make a special fit between surfaces. In fact, the whole thing would be constructed in imitation of the way in which a riveted beam, such as used as a girder, is usually made. The result obtained would obviously not be a general one applicable to steel as a material, or to beams as geometrical forms, because the data of the problem, even the dimensions of the beam itself, could not be determined with minute accuracy, nor would the actual final result be comparable in accuracy with the determination of the similar problem treated from the purely physical point of view. Hence, as the experimenter cannot pretend that his results could be more accurate than his data, it is his first duty in this line of work to find out within what limits of accuracy his experiment can be carried out, and, when he has obtained his results, to state it only within these limits. Under these conditions the statement of a result in round figures is often much more accurate than its statement down to the last decimal place which appears in the arithmetic. Technical experiment is truly scientific work if only it be conducted with full recognition of its conditions and limitations, and not as if it were a laboratory experiment badly done. Let it be recognised, first of all, that our object is generally the determination of certain facts, or quantities, or ratios which are to be found under certain very complex conditions. The duty of the engineer is to recognise these conditions, and deliberately to include certain of them in his experiment. The physicist has to spend much thought and trouble on the modifications of conditions, which are disturbing elements in his work. The conditions are his enemies. Otherwise with us, the conditions in

general form part of our problem, and for many purposes the reduction of the experiment to its lowest terms, which is the object of the physicist, would not only be impossible, but would, if it could be done, make the result quite useless to us. In conclusion, the lecturer urged the point that it is much more difficult to handle rightly the results of engineering experiment when they have been determined, than those of pure physics, and showed that much of the rapid improvement which has taken place in late years in engineering practice in respect to efficiency in the working of machinery, economy in the production of energy, and economy also in the use of material, has been due, directly or indirectly, or both, to the growth of the habit and knowledge of experiment among the present generation of engineers.

#### NOTES FROM PARIS.

THE Louvre Museum has within the last few days become enriched by the acquisition of the tiara of Saitaphernes, a *chef-d'œuvre* of goldsmith's work of extreme rarity. The tiara was found in a tomb in Scythia, and is a well-preserved example of the best Grecian work of the fourth century B.C. The bonnet-shaped form of the tiara lacks elegance; the beauty of the work lies in the finely-sculptured horizontal and parallel zones ranging from the base to the summit. A border of palm-leaves forms the lowest band; above this a sculptured frieze represents Sarmates on foot and on horseback doing battle with real or fantastic animals. Above comes a bordering of egg-pattern, and over this an inscription announcing that the tiara is a present offered by the senate and the people of Olbiopolis to the great unvanquished King Saitaphernes. Over this inscription is the most interesting portion of the work, a series of very finely-chiselled figures, the legendary scene of the wrath of Achilles, and the return of Briseis, brought back by Ulysses. The upper zones consist of foliage perfectly Grecian in style, and above all is an entwined serpent forming the terminal button. The extreme rarity of this masterpiece, together with its unquestionable artistic merit, makes this new acquisition a very valuable one.

An international conference is at present being held at Paris for considering the revision of the Convention of Berne made in 1886 for the protection of literary and artistic work. Representatives from each of the original contracting States are present at the conference, besides delegates from Scandinavia, Greece, Portugal, and the South American republics. An endeavour is being made to induce the conference to consider the question of adding architecture to the list of protected arts, and thus insure the rights of architects to the proper moral and financial enjoyment of their original works and conceptions. The committee of artistic property have recently addressed to all corresponding foreign members of the Central Society of Architects and to the presidents of foreign architectural societies a letter, asking them to aid the object in view to the best of their endeavours, either by bringing the matter under the notice of their respective governments, or by the help of their various artistic societies, to induce the delegates of their nation to make no opposition to the claims brought up by the Central Society; but rather, on the contrary, to speak in behalf of these claims. The Central Society of Architects have, since the convention of 1886, discussed the subject at every artistic congress in view of gaining its claim that architecture be placed by the side of painting and sculpture in the Article No. IV. of the convention, thus putting architects on an equal footing with other artists.

The Concours Rougevin, a foundation prize destined to encourage the study of decorative adjuncts to architecture, had for subject this year the design of an object more suitable for the competition programme of the Ecoles des Arts Decoratifs than the Ecole des Beaux Arts. The subject of last year's concours was a decorative stained-glass window; that of this year was the design for a leather cover of a book, strong, rich, and in good taste. The design, to be executed in relief of leather and metal-work, should represent an allegorical figure personifying architecture, surrounded by sketch silhouettes of the principal *chef-d'œuvre* of past ages, the whole to be framed by an ornamented bordering. The design should include the bronze hinges, clasps,

corner-pieces, &c., and an artistic effect of mosaic relief colouring was to be obtained by means of the superposition or juxtaposition of leather of various tones and colours—in fact, a modern example of the magnificent specimens of book-binding bequeathed by Renaissance art. The first medal and prize was awarded to M. Binet for a very original design, showing the author's very individual talent in the way of decorative work of a very valuable kind if applied to architecture, as it is probable the young artist has the intention of doing. M. Mouré carried off the second prize for his design for a cover, Renaissance in style, and of exceedingly good taste.

The Academy proposes the following subject for the Prix Bordin, to be awarded in 1898: "The influence of archaeology, and the advantages or inconveniences which, in point of view of architecture, may be drawn from the knowledge obtained by the study of this science. Seek out, and point out by means of examples, the consequences brought about by the study of archaeology, on the works of architecture, since the commencement of the nineteenth century."

In view of the Exposition of 1900, the Union of Decorative Arts opens a competition for the creation of decorative compositions, answering to the most varied wants of the life of to-day. These compositions may comprise—firstly, the fixed or movable decoration of the dwelling, interior architecture, furniture, utensils, &c.—secondly, the decoration of the person, stuffs, jewelry, &c. The competition is a double one; the preliminary designs are to be sent in by the end of March, 1897. The prizes amount to about £1,500.

The programme for the two palaces to be raised in the Champs Elysées for the coming Exposition was published on the 25th April. The estimated cost of the principal building is £640,000, and of the smaller one £160,000. Premiums amounting to £1,800 for the former building, and £600 for the latter, will be awarded.

Much regret is expressed here at the death of the Portuguese architect, M. le Chevalier Narciso da Silva, corresponding member of the Central Society of French Architects, and one of the best known members of the various congresses of architecture and archaeology. M. da Silva followed his early studies at the Ecole des Beaux-Arts at Paris, in the Atelier Percier, passed several later years amongst the French prize-winners of the French school at Rome, and was a constant visitor to Paris, and the Ecole, during the later years of his life. He was officer of the Legion d'Honneur, officer of the Order of Instruction Publique, and Associate of the Institute of France. His real and great interest in French architectural work and art made him to be greatly esteemed by his French confrères.

ARTHUR VYE PARMINTER.

#### CHIPS.

A county police station is in course of erection at Herne Bay, from plans by the county surveyor. Mr. J. W. Porter is the contractor.

A start has been made with the alterations at Montpelier Station, Bristol, recently decided upon by the joint committee of the Great Western and Midland Railway Companies. The work includes extending the roof over the platforms and providing better waiting-room accommodation on the Cromwell-road side of the line.

Earl Fitzwilliam has promised £500 towards the restoration of the tower of St. Leonard's Church, Malton, which is in a dangerous condition.

At the church of the British Embassy in the Rue d'Agnesseau, Paris, on Friday, the Rev. Dr. Noyes unveiled a marble medallion by M. Boucher, erected by subscription, in memory of the late Rev. T. Howard Gill, who was for seven years chaplain of that church.

Mr. Charles J. Jenkin, of Llandudno, has been appointed to the position of surveyor to the township of Willenhall, Staffs. There were nearly forty candidates.

The Lowestoft Town Council discussed, at their last meeting, a new sewage outfall scheme by which the outlet will be 120 yards south of the present site, and the estimate for which is £6,825, about £2,000 less than the lowest tender for the former scheme. The new scheme was adopted by 13 to 9.

At Marylebone Police-court, on Tuesday, John Burslow, builders' labourer, was sentenced to one month's hard labour for intimidating another labourer named James Andrews, in the employ of Mr. Gregory, of Lavender-gardens, S.W., on a job in Holmes-road, Kentish Town, in connection with the present strike.



## CONTENTS.

"The Plastic Artist Needs no Festival" .....	661
The Experimental and the Practical .....	661
Pictures at the Royal Academy.—II. ....	662
Architecture at the Royal Academy.—II. ....	664
The Salon of the Champs Elysées .....	665
The Deficit at the Institute .....	666
BUILDING NEWS DESIGNING CLUB .....	667
An Architect's Call at the Institute of Clayworkers .....	667
Notes on Domestic Drainage.—XIII. ....	668
Physical Experiment and Engineering .....	669
Notes from Paris .....	670
The BUILDING NEWS Directory .....	XI.
Our Illustrations .....	671
Wood and Steel Pipes .....	671
Building Intelligence .....	690
Architectural and Archaeological Societies .....	690
Engineering Notes .....	690
Competitions .....	691
Correspondence .....	691
Intercommunication .....	693
Legal .....	693
Legal Intelligence .....	694
Parliamentary Notes .....	695
Our Office Table .....	695
Meetings for the Ensuing Week .....	696
Trade News .....	696
Water Supply and Sanitary Matters .....	697
Tenders .....	697

## ILLUSTRATIONS.

"JACQUELINE VAN CAESTRE," BY RUBENS.—UNIVERSITY COLLEGE HOSPITAL.—HOUSE IN PARK LANE.—CHRISTIE LIBRARY, OWENS COLLEGE.—"BUILDING NEWS" CLUB DESIGNS FOR STABLING AND CATTLE STANDINGS.

## Our Illustrations.

OLD MASTERS ON THE CONTINENT: XXXIII.—PORTRAIT OF JACQUELINE VAN CAESTRE, BY PETER PAUL RUBENS.

THIS is one of the series of thirteen works by Rubens, located in the Palais des Beaux-Arts at Brussels, and it ranks among those which bear the finest evidence of the master's hand. The portrait is one of a pair, Charles de Cordes and Jacqueline van Caestre his wife. She is sumptuously attired in a gorgeously brocaded costume, elaborated with shaped and corded velvet trimmings, the whole bodice being enhanced by pearls and jewels, while the necklace and earrings add to the richness of the composition, which is set off by the lace collar, fastened by a large massive brooch on the breast. In our issue for June 28, last year, we published an article by Mr. Charles Eastlake, the keeper of the National Gallery, giving a concise reference to the works of the great Flemish master, whose genius and idiosyncrasies do not require to be enlarged upon here, and even a skeleton list of his works would be beyond the scope of our space.

## UNIVERSITY COLLEGE HOSPITAL.

THE well-known but inadequate buildings of the University College Hospital have for some time been doomed. Mr. Waterhouse's perspective drawing exhibits his solution of the problem laid before him by the hospital authorities, the question being how to obtain an airy, sanitary, and sunlit hospital without going beyond the bounds of the present block of buildings owned by the institution. The accommodation is not restricted to the present area of the hospital, but has been extended by the addition of all the property bounded by Gower-street, Grafton-street, Huntley-street, and University-street, the freehold of which has gradually fallen into the hands of the hospital. The drawing itself explains that the adoption of a diagonal cross is the principle on which the design has been worked out. The ground floor or basement occupies the whole of the site, but above the level of this story the higher buildings assume the diagonal form. Sanitary towers form the ends of each limb, and in every case they are cut off from the body of the building by an open staircase. The wards also are cut off from the central staircase by bridges with windows. The spaces between the bridges admit of a free passage of air between the four funnel-shaped spaces inclosed by the wings, thus preventing the possibility of a stagnation of air, from whichever quarter the wind may be blowing. Corridors, in the hospital proper, are practically non-existent, as the wards occupy the wings from wall to wall.

## HOUSE FOR MR. BARNEY BARNATO IN PARK LANE.

THIS house is being erected in Park-lane for the well-known Mr. Barney Barnato. Mr. T. H. Smith, of 17 and 18, Basinghall-street, E.C., is the architect.

## THE CHRISTIE LIBRARY.

THIS library is the gift, to the Owens College, Manchester, of Mr. Richard Christie, the Chancellor of the Diocese, and is the work of Messrs. A. Waterhouse and Son. In external material the building is identical with the earlier portions of the college, except that Stanton Woodhouse has been substituted for Minera stone. The perspective drawing shows the connection of the library with the central buildings by means of a bridge-corridor at the level of the principal floor. Besides presenting the building, Mr. Christie has the intention of bequeathing a collection of books, for which a home is provided in a portion of the first floor specially set apart, and separated from the general reference library and reading-room by a carved-oak screen. The ground floor is divided into compartments for various special collections, including the "Freeman" and "Muirhead" libraries. The science library is placed on the second floor. The total dimensions of the building are 100ft. by 46ft., and it is situated on the south side of the large quadrangle adjoining Burlington-street. The general contractor is Mr. Henry Vickers, of Nottingham, and the heating is being carried out by Mr. Grundy. The staircase is in Stuart's granolithic material.

"BUILDING NEWS" DESIGNING CLUB: A BLOCK OF STABLES AND COW-STANDING.

(SEE description on p. 667.)

## CHIPS.

New boards schools are about to be built at Fowey from plans by Mr. Silvanus Tremain, of Truro.

A select committee of the House of Lords threw out, on Tuesday, the Avondale and Sorn Railway Bill, which proposed to incorporate a company for constructing a railway, over 17 miles in length, from Avondale to Sorn, in the counties of Lanark and Ayr.

In the Sheriff's Court, Paisley, on Tuesday, William Sheedon, consulting engineer, and principal of the Science Department of the Government School of Art, Paisley, was awarded £1,000 damages for slander. The action was against William Bryce, coal merchant and gas inspector, of Paisley.

The annual meeting of the Edinburgh Architectural Association was held on Wednesday evening at the Royal Institution in that city. Mr. Thomas Ross, F.S.A.Scot., vice-president, who occupied the chair, announced that, owing to unforeseen circumstances necessitating his absence, the president was unable to be present or to deliver his valedictory address.

The general purposes committee of the West Bromwich Corporation report that they have accepted with regret the resignation of Mr. J. T. Eays, who has held the post of borough surveyor for nearly seventeen years, and have appointed a sub-committee to consider the question of the appointment, duties, and salary of a successor.

The excavations which are being carried out in Melos by the British School of Archaeology have resulted in several discoveries, including a draped life-size statue of a priest of Dionysus, of which the head and the left hand are missing, and a colossal statue of which the head and limbs are missing, but a portion of the right leg and foot has been recovered. Four draped torsos of the Roman period have also been found, one probably being a statue of Agrippina. A Roman mosaic pavement, covered with representations of birds, fishes, and flowers, has been laid bare, and some 30 inscriptions have been discovered.

The nave of the little parish church of Colne, Hants, lying between Somersham and Bluntsham, was totally destroyed last week by the collapse of the tower on an exceedingly still morning. The chancel, portions of the north and south walls and south porch alone remain to show the original limits of the parish church, and these are surrounded with "Danger" notice-boards. The building had been in a dilapidated state for years, and about £400 had been collected for its restoration or replacement by a new building, to be erected on a fresh site in the centre of the village.

At the town hall, Tunbridge Wells, on Tuesday, Mr. Theodore Thomson, M.D., inquired, on behalf of the Local Government Board, into the application by the town council for sanction to borrow £2,421 13s. 3d. for hospital purposes. At a previous inquiry the Local Government inspector went into the proposals and the plans, and subsequently the application for authority to borrow £7,450 was granted. Extras had been found necessary, and the details of these liabilities to meet which the present application was made, were explained by Mr. Mellor, the borough surveyor.

## WOOD AND STEEL PIPES.

IN an interesting paper in the *Proceedings* of the American Society of Civil Engineers, on "The Astoria City Waterworks," by Arthur L. Adams, M.Am.Soc.C.E., the author gives a description of the wood-stave pipes and the steel pipes used. Of the former, the staves had to be thin enough to secure complete saturation, and to deflect to the curvature desired. The bands had to be spaced so as to secure strength and prevent injurious strains on the staves. For the staves, native yellow fir was employed. The staves were run from 2in. by 6in. stuff, with a finished thickness of 1½in., and twelve staves completed the circle. Lumber free from knots, pitch-seams, and other defects were specified; the pitch-seam prevented a large proportion of the lumber being used. The lumber was about three months from the log when the staves were cut. The staves varied in length from 12ft. to 24ft., their faces were run true to the circular form of pipe, with edges made radial, and a slight projection or bead along the centre line of one edge. For pressures up to 80ft. head, no attention was paid to the character of the grain, but for all greater pressures only slash-grain staves were used. When put under pressure of 40lb., and allowed to remain some days with an occasional increase by means of a pump to 120lb., a few coarse-grained, quarter-sawn staves allowed percolation through them at 40lb. pressure, and considerable leakage at 120lb. The bands were spaced for a factor of safety of about four. A ½in. round band of mild steel upset to ½in. would meet the requirements. The steel was specified to a tensile strength of from 58,000lb. to 65,000lb. to the square inch, and a limit of elasticity of 30,000lb., and capable of being bent cold and hammered flat without fracture. Particulars are also given of an ingenious means, devised by Mr. Behr, for making measurements of the strains induced in the bands by the swelling of the staves, as it was very necessary the bands should not be overstrained. A mild steel spring, like a large tuning-fork, was used for this purpose, an illustration of which is given. The results of experiments seem to show that the limit of safe pressure in wooden pipe to be about 100lb. per square inch under the most favourable conditions with this timber. The swelling of the staves alone develops a temporary strain of about 125lb. per square inch—a fact which accounts for the frequent bursting of tanks built with thick staves. The bands were spaced according to the pressure. Thus at 75 head in feet the spacing was 5½in.; at 92ft. head it was 4in., or 300 bands per 100ft. of pipe; at 131ft. head the spacing was 3in., or 400 bands per 100ft. of pipe, and so on.

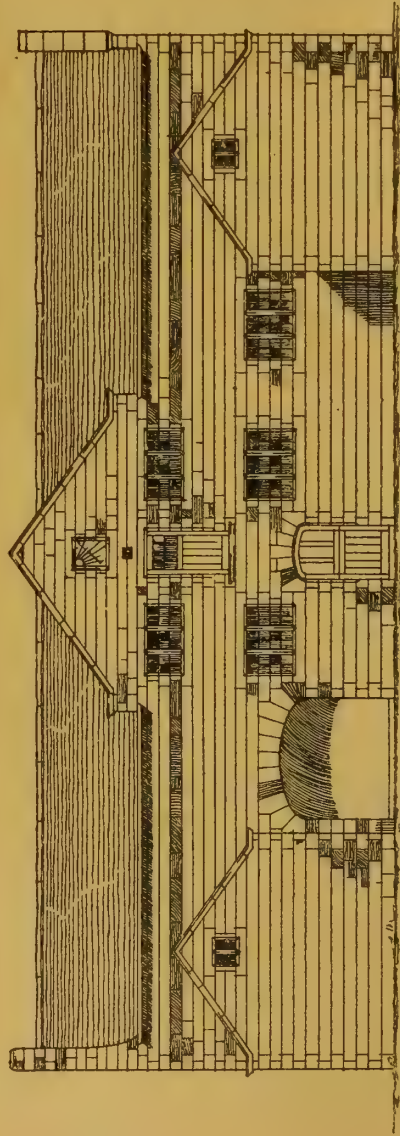
Lady Windsor, mayoress, opened, on April 30th, the new corporation baths at Cardiff. The baths, which are erected in Guildford-crescent, cost the town nearly £14,000, and have been built by Mr. W. Symonds, of Cardiff.

In the course of the excavations that are being carried on by the French at Delphi, a bronze statue has been found of great artistic interest. It is the statue of a man of natural height, with a beard. The work, which is the largest of the kind yet discovered, dates from the 5th century B.C. The only imperfection is that the left hand is missing. In the right hand of the statue the bridle of a horse is held. The feet of this animal, as well as the tail, have also been discovered.

At a meeting of the Congregationalists of Stafford, held on Thursday evening in last week, the tender of Mr. Lindsay Jones, of Wolverhampton, for carrying out the enlargement and renovation of the chapel was accepted. The total outlay will be about £1,700. The chapel will be lengthened 12ft., the caretaker's house in the chapel yard will be removed, a new front of Renaissance design will be erected, all the old windows will be replaced by new ones filled with cathedral glass, a rostrum and platform will take the place of the present pulpit, the galleries will be lowered, the organ (which is to be enlarged) will be brought to the ground floor, the roof will be put into good order, and the whole will be painted and decorated. The work will be done from the designs and plans of Messrs. Ingall and Son, architects, of Birmingham.

A bronze and marble memorial of the late Dr. Beavan N. Rake has been placed in the museum of Guy's Hospital, where he pursued his studies. The subject is allegorical, representing Science holding in his right hand the staff and serpent of Aesculapius, and with his left holding down disease, over whom he has triumphed. The sculpture was executed by Mr. A. C. Luchessi, a fellow-member of the Savage Club.

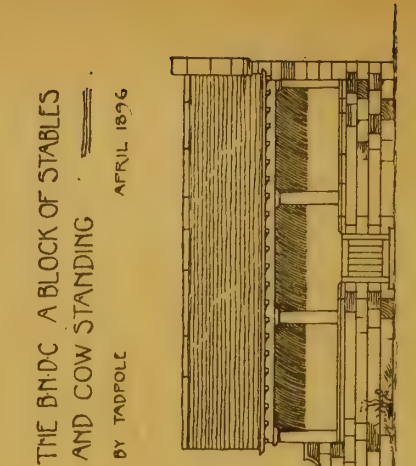




FRONT ELEVATION

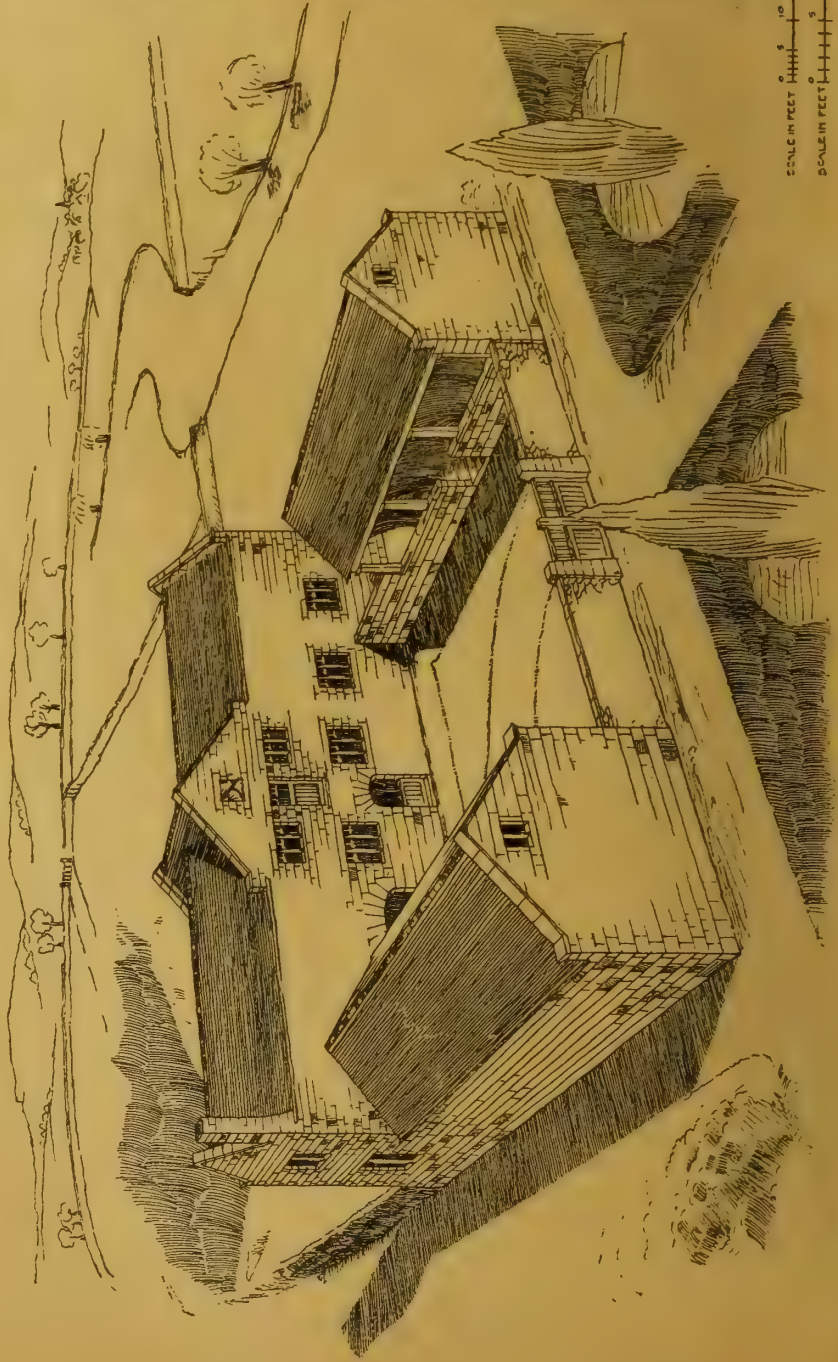


SECTION THROUGH STABLES

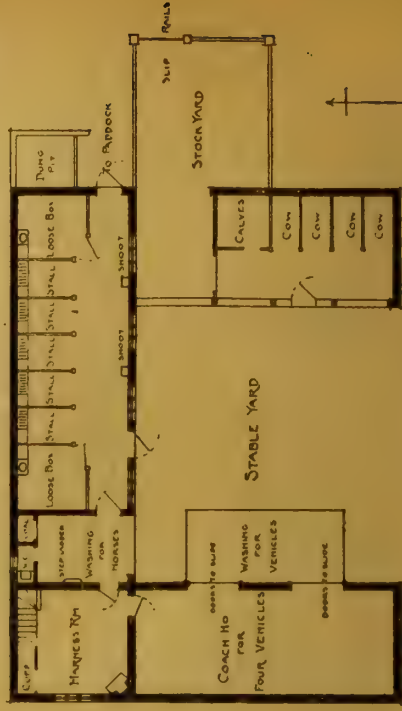
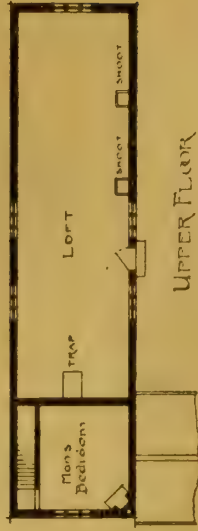


ELEVATION OF COW SHED

THE BND. A BLOCK OF STABLES  
AND COW STANDING  
BY TADFOLC  
APRIL 1896



UPPER FLOOR  
PLACED FIRST



GROUND PLAN

SCALE IN FEET 0 10 20 30 40 50 60 FOR PLANS  
SCALE IN FEET 0 10 20 30 40 50 FOR ELEVATIONS







THE BUILDING DEWS. MAY. 3, 1896.







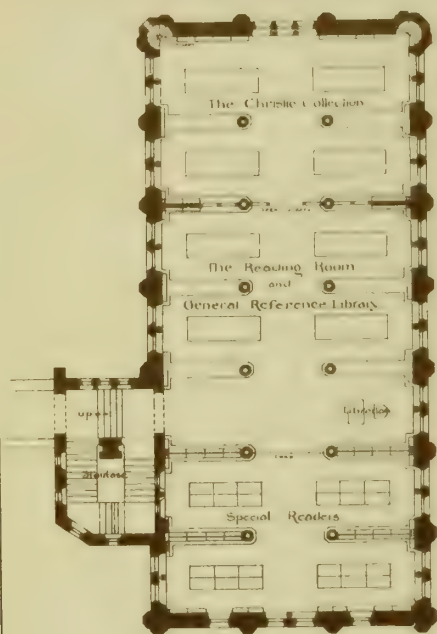




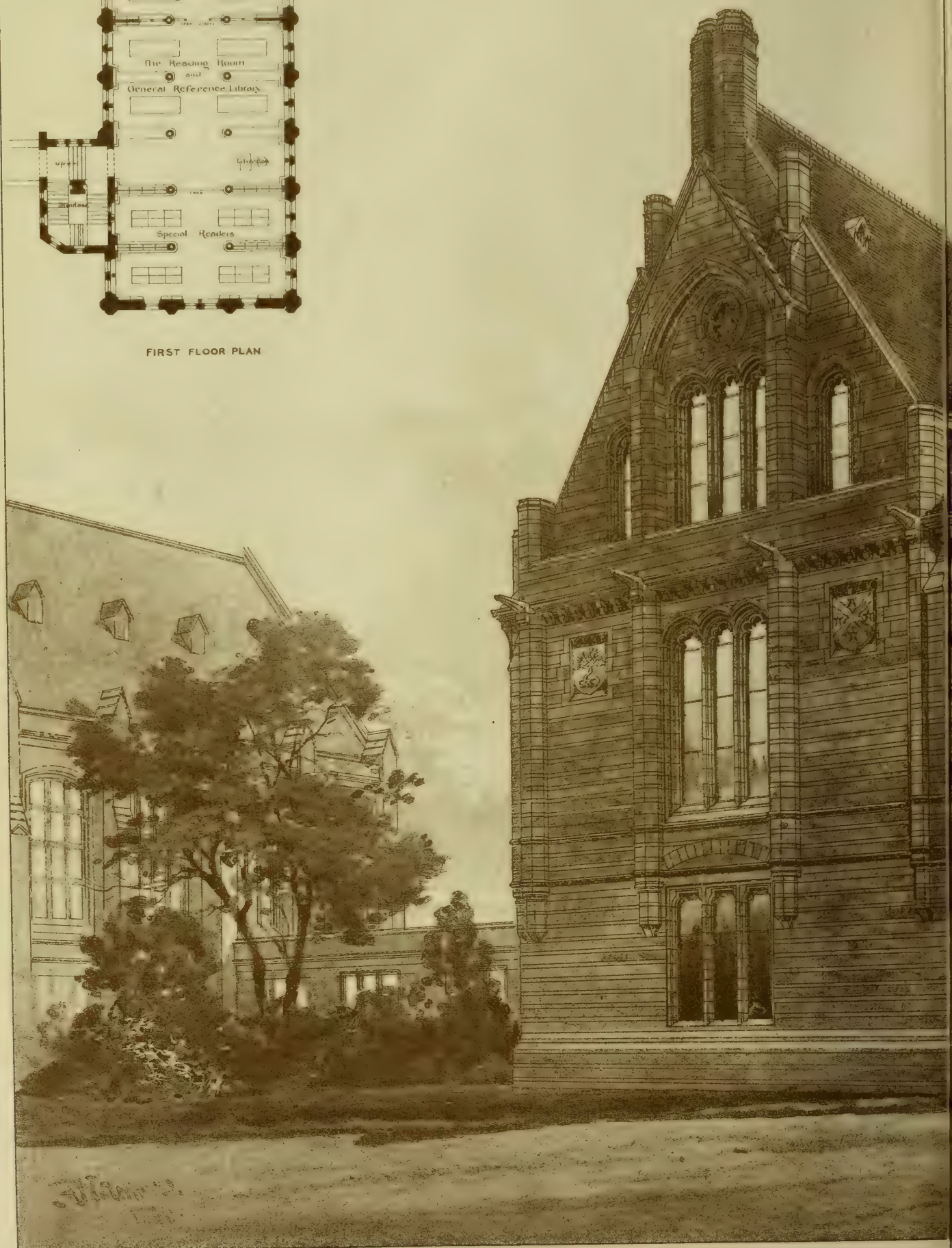




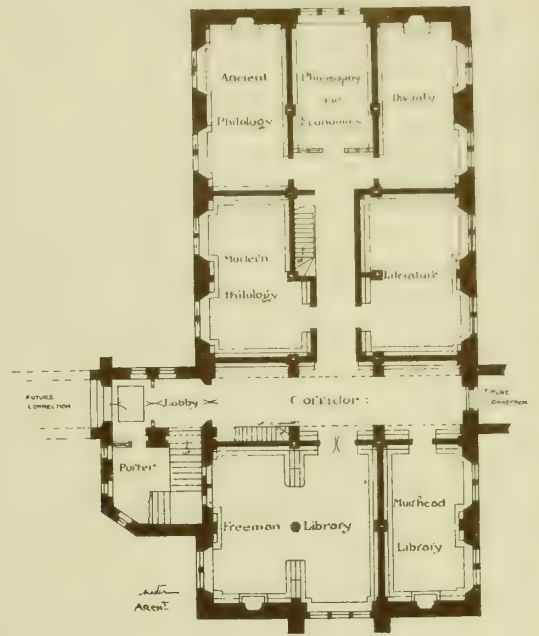




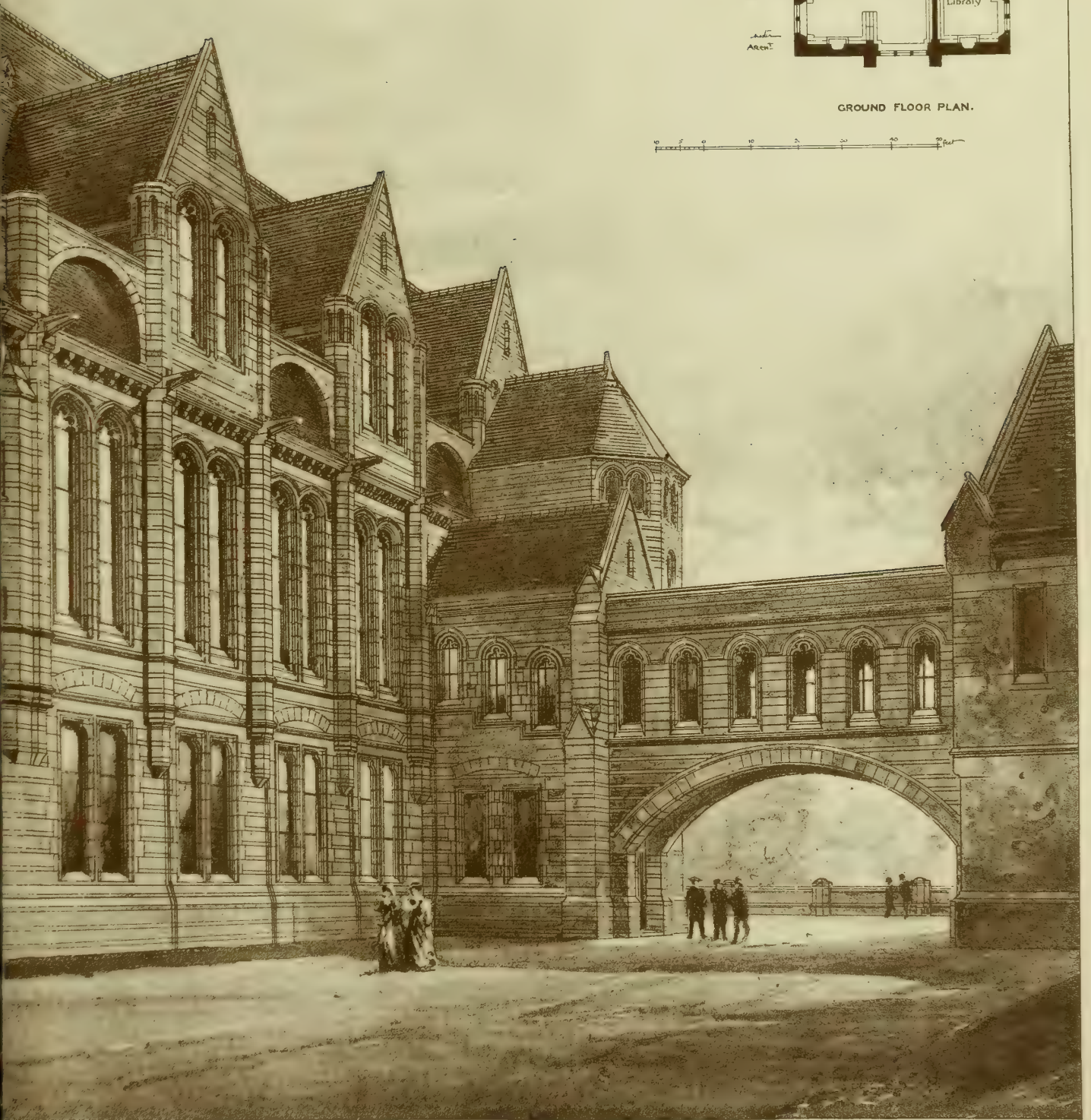
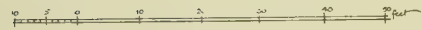
FIRST FLOOR PLAN







GROUND FLOOR PLAN.









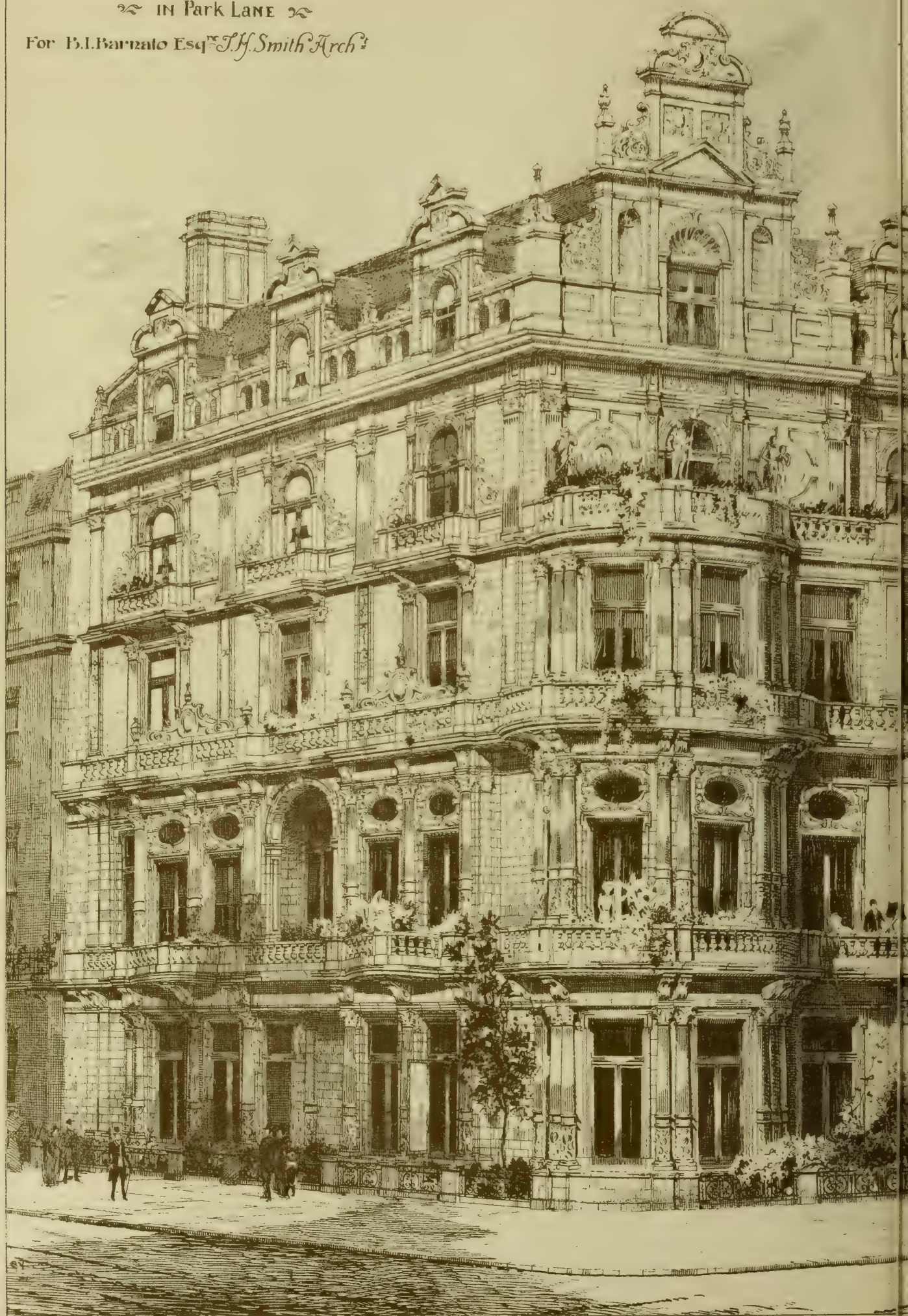




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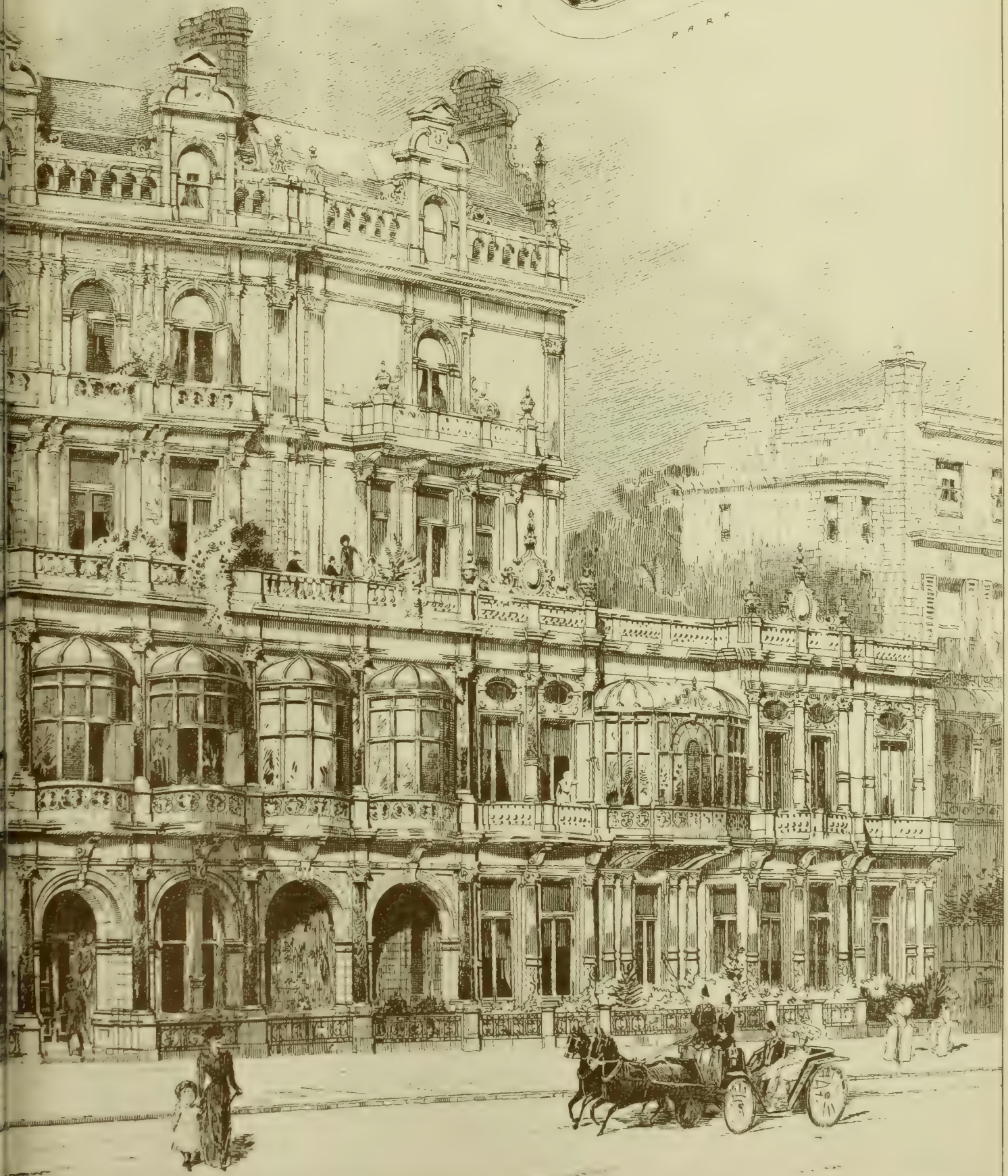
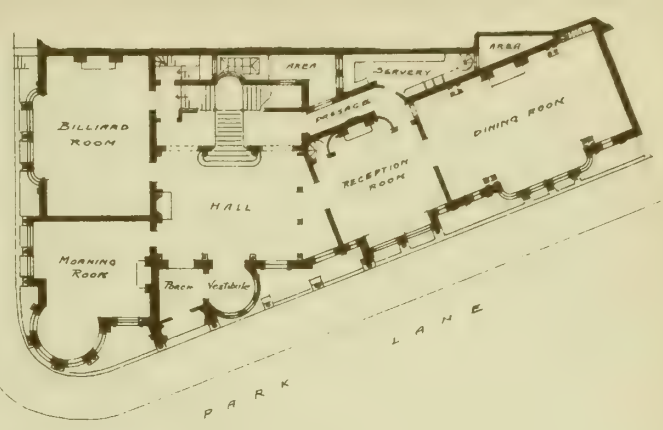
IN Park Lane

For B.L.Barnato Esq<sup>r</sup> J.H. Smith Arch<sup>t</sup>





GREY STANHOPE STREET



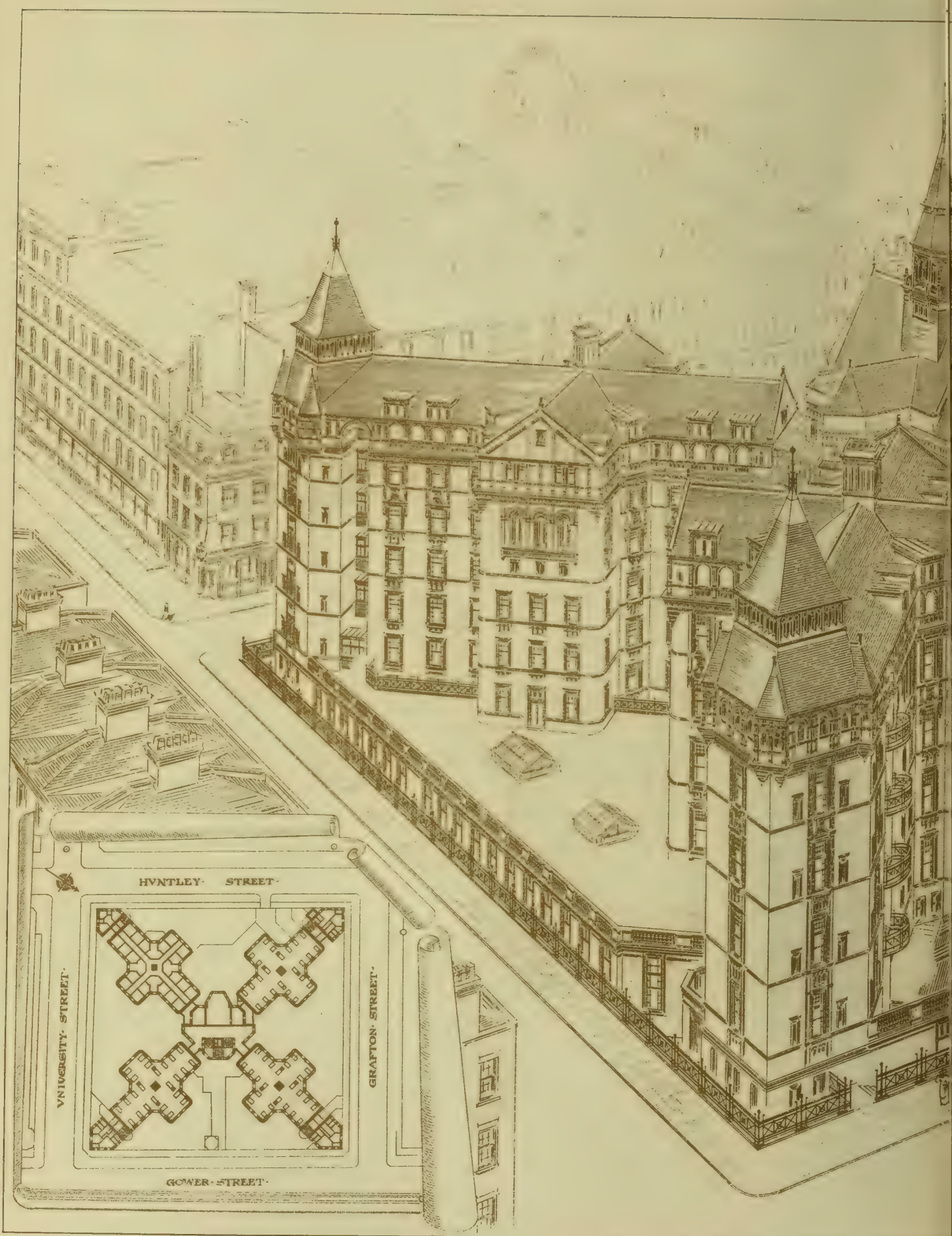














May 3, 1896.



UNIVERSITY COLLEGE  
HOSPITAL

PROSPECT FROM THE EAST  
OF THE PROPOSED  
RECONSTRUCTION & ENLARGEMENT

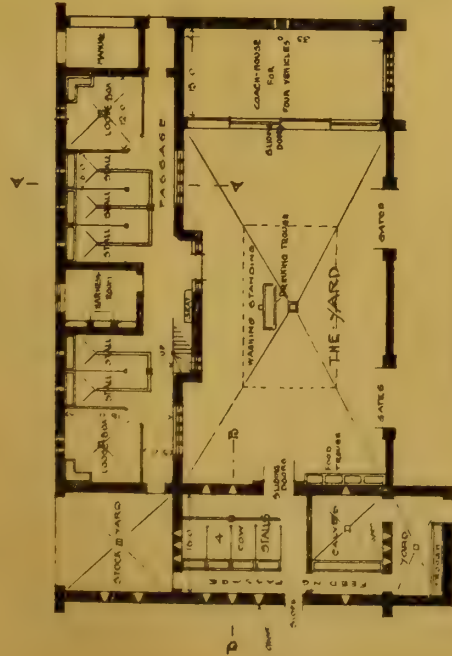
*A. Waterhouse.*

Mar. 1896.





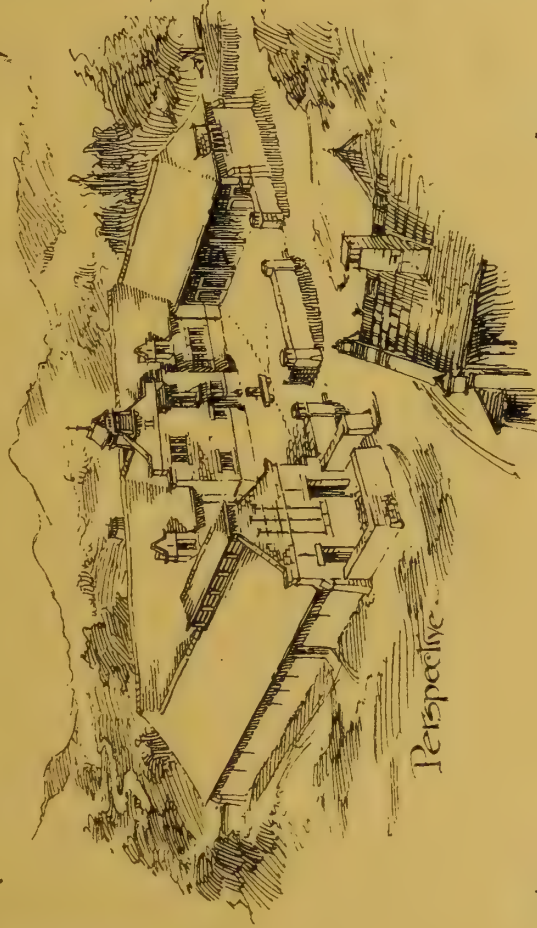
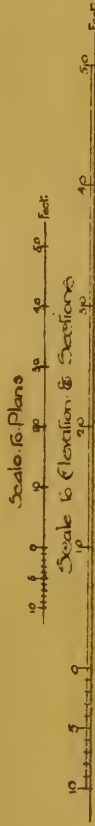




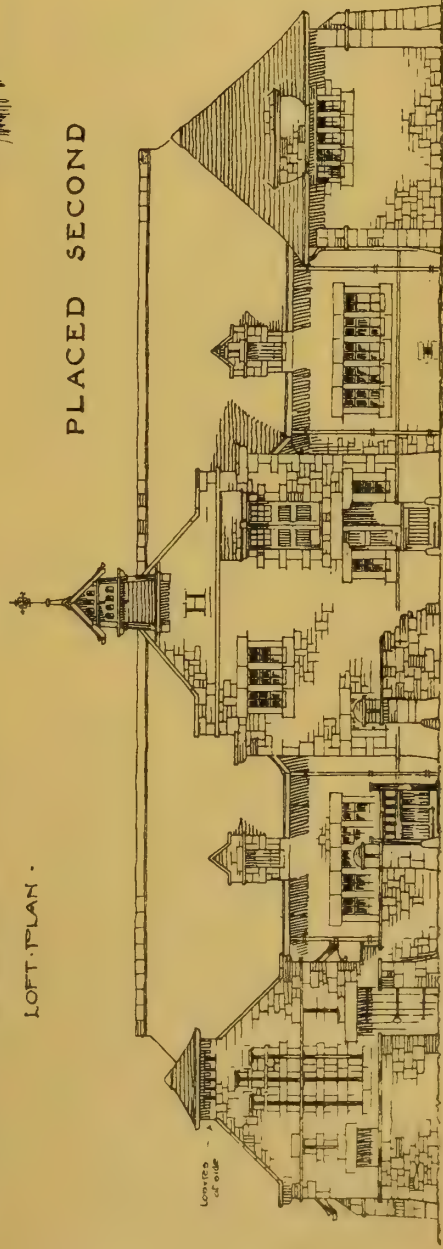
GROUND PLAN.



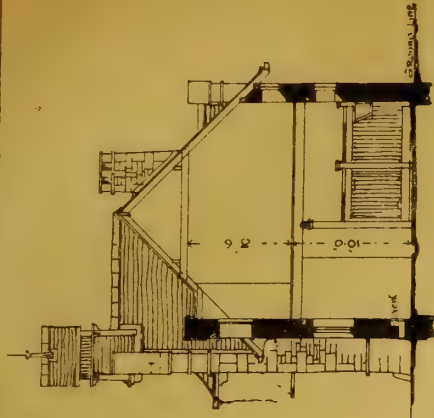
LOFT-PLAN.



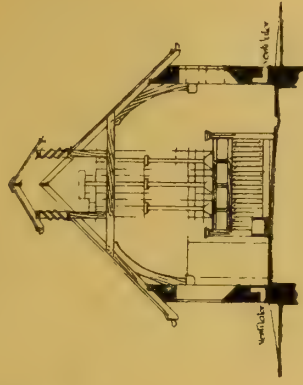
Perspective



ELEVATION. —



SECTION. A. A.



SECTION. B.B.

THE BUILDING · NEW · DESIGN · CLUB.

Stabling  
Cowshed·ek·to  
A·County·House·

Pr - 1. 1. 2008



## Building Intelligence.

**CARDIFF.**—The Empire Palace Theatre, which has been reconstructed, from Mr. Frank Matcham's plans, on the site of a smaller building in Queen-street, was opened on Monday. The principal frontage is faced with red brick and Bath stone, the centre portion being carried up as a tower, containing a large circular window. The ground floor is divided into entrances to the different parts of the theatre. The theatre has been designed with a view to carry on two performances a night, and the entrances and exits are, therefore, in duplicate. By the provision of waiting-rooms it is possible to take the money for the second performance whilst the first is in progress. The entrances are so arranged that no movable barriers are needed. The auditorium has a sliding roof, and the galleries are carried on cantilevers, without a column to intercept the sight. The ground floor is divided into faueteils, ten rows of pit-stalls with lift-up chairs, and 11 rows of pit, the whole accommodating about 1,100 persons. The grand circle has five rows of tip-up chairs. At the sides are raised promenades, and at the rear are 13 private boxes and corridors, and a foyer fitted with lounges, the floors being covered with Axminster carpet, and the ceilings decorated. Over this circle is the balcony, having a wide promenade at the side, and at the rear a gallery. The stage is fitted up with the usual traps and bridges, and all scenery can be taken up without rolling. At the rear of the stage is an additional stage (it being the old hall), a depth of over 50ft. thus being obtained. At the sides and rear of the same are the scene docks, property-rooms, and paint-rooms. At the side of the stage is a separate block containing dressing-rooms and a green room. The decorations of the auditorium are in French Renaissance, the ceiling being divided into panels and coves, with raised enrichments, and the whole decorated in colour and bronze. The cost has been about £25,000. The contractors were Messrs. J. E. Turner and Sons; and Mr. E. H. Swann was the clerk of works.

**SHEFFIELD.**—The new board schools on Bole Hill, which have been built at a cost of £8,793, were opened on Monday. On the first floor is a mixed department, comprising a schoolroom and four classrooms. All the entrances have cloak-rooms and lavatories, and teachers' rooms and stores are also provided. Every classroom can be entered both from the corridor and from the schoolroom. The exterior is faced with local wallstone, the style being a Free Renaissance. A detached caretaker's house is provided, as well as playsheds. The general contractors were Messrs. G. Longden and Son; Mr. R. L. Lowe executed the wood-block flooring. The architect is Mr. W. J. Hale, of St. James-row, and Messrs. Cartwright and Laidler have acted as clerks of the works. The buildings cost £8,793, which makes the cost per head for the school £10 15s. 9d., or, including the cost of the site, £12 3s. per head. Accommodation is provided for 420 boys and girls, and 395 infants.

**SOUTH WIGTON, LEICESTER.**—A new boot and shoe factory has just been completed near Glen Parva railway-station, for Messrs. Toome and Black. The building is of brick, relieved with Sydnope stone, is in the Renaissance style, and covers an area of 310ft. by 173ft. The factory proper is built upon the American principle of one story, and is flanked right and left with two octagon towers. The building is lighted from the north. All the departments are separate and distinct from each other, being divided by partitions. Messrs. Simpson and Harvey, Alliance Chambers, Leicester, were the architects, and the main contractors were Messrs. Halford and Sons, Blaby.

**TRURO.**—Preliminary plans, prepared by Mr. Silvanus Trevail, of the County Technical Schools and Art Gallery, which Mr. J. Passmore Edwards has undertaken to erect at Truro, show a range of buildings east of the existing two-storied Free Library. The main frontage will be 152ft. in length, and the depth 56ft. The institute will be three stories in height, and the architect has broken it into three portions for roofing, the main block being the central portion. Gabled wings conceal the difference in height between the library and the institute. The style will correspond generally with that of the library, in being built of similar materials, and having mullioned transomed windows. The main frieze will run at the

same level through both buildings, so that the present inscription on the Free Library will, with the continuation on the Institute, read "Passmore Edwards Free Library and Central Technical Schools for Cornwall." To the right and left of the main entrance and vestibule are science classrooms, each measuring 21ft. by 20ft. Corridors lead to classrooms for cookery, dress-making, and other domestic subjects, and store-rooms, while provision is made for cooking-ranges by coal, steam, and gas. To the north is a general lecture-hall, 30ft. by 20ft., with raised circular seats for students, having a north light, and provision for lecture counters, diagram, and other boards. On this floor is also a secretarial office department, with storage capacity. At the eastern end of the main corridor is the chief chemical laboratory, measuring 36ft. by 20ft., and adjoining are principal's rooms, balance, and store-rooms. In the basement provision is made for heating the whole building by hot water on the high-pressure system. On the first floor are two science classrooms, 21ft. by 20ft. Over the general lecture hall is an art school, 30ft. by 20ft., with north light, and a mechanical drawing school, 27ft. by 22ft. Facing the main staircase is ample lavatory accommodation. Off the eastern corridor is the county art gallery, 48ft. by 20ft., and carried up to the second floor, with top lights. This gallery is intended to contain such pictures and portraits as may from time to time be presented to the county for historical or artistic reasons. Out of this gallery by sliding doors are two annexe rooms, intended for the reception of loan exhibits from South Kensington. These two rooms will also be available for technical classes. On the upper floor there will be a room for clay modelling, another art school, and a series of large rooms.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—The 48th session of the Liverpool Architectural Society was held at the Law Library, Union-court, Liverpool, on Monday evening. Mr. A. Culshaw, F.R.I.B.A., the retiring president, occupied the chair. The annual report of council and financial statement having been received, the president delivered a closing address. Mr. G. Bradbury was elected as president, and Messrs. H. W. Keef and J. Woolfall as vice-presidents for the ensuing session, Mr. J. W. Blakey being reappointed as librarian, Mr. James Dod as treasurer, and Mr. Henry L. Beckwith as secretary.

On Saturday afternoon the Bishop of Lichfield paid a visit to Darlaston for the purpose of opening a new parish room, which has been provided for All Saints' Church, at a cost of about £600, from designs by Messrs. Cossins, Peacock, and Bewley, the builder being Mr. S. Teece, of Darlaston.

At Christ Church, Wellington, Salop, on Sunday, the Bishop of Shrewsbury (Sir F. Stamer) dedicated a carved oak pulpit to the memory of the late Mrs. Thomas Owen, wife of the vicar of the parish. The pulpit cost about £110, subscribed by members of the congregation. The work was carried out by Messrs. Jones and Willis, Birmingham.

The directors of the Glasgow Free Church Building Society have issued a report in which they propose that sites be at once secured for the ultimate erection of fourteen new churches in ten districts of the city. The increase of the population of these districts from 1891 to 1895 was 43,559, as against 4,322 in the other districts of the city and suburbs. In these districts, taken as a whole, there was only one Free Church per 12,489 persons, as against 6,599 in the other districts of the city and suburbs; and in some parts of these districts there was a population of upwards of 25,000 without a Free Church. The report concludes, as a matter of course, with an appeal for subscriptions.

On Monday Canon Ingram unveiled a stained-glass window that has been erected in the church of St. Peter, Saffron-hill, to the memory of Mr. Luff Stocker and his son, Mr. John Palmer Stocker. The window has been designed by Miss Loundes, of Chelsea, and the work has been carried out by Messrs. Britten and Gibson, of Southwark. The window consists of three lights, in the upper portion of each being a figure representing St. John, St. Peter, and St. Paul respectively. The background is a landscape, with the river of water of life winding through the meadows. Beneath the figures are representations of the martyrdom of the apostles depicted above—St. John in the cauldron of boiling oil, St. Peter on the cross, head downwards, and St. Paul being decapitated.

## Engineering Notes.

**NORTH CORNWALL RAILWAY.**—The section of the North Cornwall Railway from Delabole to Wadebridge has been officially inspected by Col. York, representing the Board of Trade, and was opened for passenger traffic a few days ago. The new section is 10½ miles in length, and its construction, which has occupied since the autumn of 1893, has presented many difficulties. The principal works were the making of a tunnel at Trelill, a fifth of a mile in length, on a 30-chain bend, and the fixing of an iron bridge, with a 60ft. span, over the River Camel, just before the junction with the old line, three-quarters of a mile from Wadebridge. The distance from Port Isaac-road station and the Wadebridge terminus is over six miles. The contractors are Messrs. Curry, Reeve, and Co., and Messrs. Galbraith and Church, London, were the engineers; Mr. B. J. Fisher being the district engineer, and Mr. Salter the resident engineer.

**THE CENTRAL LONDON ELECTRIC RAILWAY.**—The Electric Traction Company (Limited), of Great George-street Chambers, S.W., who are the contractors for the construction of the Central London Railway from Shepherd's Bush to the Bank, have accepted the following sub-contracts for the construction of the tunnels:—Shepherd's Bush to the Marble Arch (sections 1, 2, and 3), Mr. John Price, of Westminster; Marble Arch to the Post Office (sections 4 and 5), Messrs. Walter Scott and Co., of Newcastle-on-Tyne; the Post Office to the Bank (section 6), Mr. George Talbot, of Glasgow. The work on all these sections will be commenced early in July, and completed about October, 1897.

## CHIPS.

At a general meeting of the Royal Society of Painters in Water Colours, held last week, Mr. W. Eyre Walker was elected a full member.

At the Clayton Hospital, Wakefield, iron outside escape staircases are being fixed from each large ward, at a cost of about £120. Mr. Alfred Oakes is the contractor, and Mr. W. Watson the architect.

His Royal Highness the Prince of Wales, Grand Master of Freemasons, has selected three members of the profession for his grand officers during his twenty-second year of office—Mr. Rowland Plumble as Grand Superintendent of Works, Mr. Henry Lovegrove, Grand Sword Bearer, and Mr. Francis Newman, of Ryde, Grand Standard Bearer.

The partnership heretofore subsisting between T. Archer and F. G. F. Hooper, architects, at Amberley House, Norfolk-street, Strand, W.C., under the style of Archer and Hooper, has been dissolved.

The death occurred suddenly on Friday, at his residence, 333, Broad-street, Pendleton, of Mr. Henry Roper, J.P., decorator, who had been a member of the Salford Town Council since 1879. He was prominently connected with the Rechabite organisation. The deceased, who was 64 years of age, was made a borough magistrate two years ago.

The Scarborough Board of Guardians have unanimously adopted plans for a proposed new boardroom, prepared by Mr. E. W. Barry, as amended, comprising clerks' rooms, committee-rooms, and vagrants' wards, the estimated cost of the work being £1,450.

The Lanarkshire and Dumbartonshire Railway was opened on Friday from Kelvinside, Glasgow, to Scotstoun for goods traffic.

The annual report of the borough surveyor of Dudley, Mr. J. Gammage, just issued, states that the total cost of maintaining the whole of the roads and streets in the borough has been £5,651, equal to £131 8s. 6½d. per mile. The committee is continuing the work of paving streets, and a large number will be completed during the ensuing year. The length of footways paved since 1881 (including approach roads) has been 40,005 lineal yards, or 22½ miles, at a cost of £14,177 5s. 6d., or 1s. 1d. per yard.

Mr. J. S. Dunn has been appointed, under the engineer of the Cape Town Corporation, to assist in supervising the reconstruction of the main drainage system of that city.

The London Sea-Water Supply Bill came before a Select Committee of the House of Commons on Friday. Mr. Harrison Hayer, Past President of the Institution of Civil Engineers, gave evidence, showing the practicability and usefulness of the scheme. It involved no serious engineering difficulties, and sea water would be a boon to the Metropolis in many ways. The Committee declared the preamble of the Bill proved.



## COMPETITIONS.

**BARNOLDSWICK.**—In a recent limited competition for the Barnoldswick Conservative Club, the plans of Mr. J. W. Broughton, architect, of Skipton, were accepted.

**BRISTOL.**—The premium of fifty guineas offered by the Sanitary Committee for the best design for the tramway waiting-room at St. Augustine's Bridge attracted a large number of applicants for plans of the site and conditions of the competition, and seven or eight designs have been sent in—the majority coming from architects outside Bristol. The designs will be opened in the presence of the committee, and a special meeting will be arranged to inspect the plans and award the premium.

**LINCOLN.**—A limited competition among selected architects known as specialists chiefly in the matter of public baths, has been held at Lincoln for submitting designs in reference to the city establishment about to be built there to comprise two swimming-baths and various sets of slipper-baths on a very narrow and long site having frontages in Newland and Brayford Head, close to the River Witham. Mr. Rowland Plumb acted as referee, and drew up the conditions. The cost, stipulated at £9,000, is manifestly inadequate for properly constructing and fitting up so large a building. The design submitted by Messrs. Spalding and Cross has been recommended by the adjudicator for adoption, and the plans have been on view for three days during the past week, but of this no official intimation was received, we understand, by the unsuccessful competitors. Indeed, so unsatisfactory does the award appear to be, that the following protest has been lodged with the town clerk. As this document states facts only, and not mere opinions, it would seem to furnish another case in which an investigation is demanded. Besides the points enumerated below, it is to be noted that in the chosen plan there are no vestibules at the entrance, the hall is only 12ft. wide with the pay-office taken out of it, although the conditions specified spacious entrance halls. The slipper-baths are only 14ft. 9in. wide to each set, so that when the widths of the bath-boxes are taken off on each side, a passage-way of only 2ft. 7in. wide remains. This applies to the first-class baths as well as the women's. Only 4½in. walls with piers divide the ladies' and gentlemen's baths, and many of the outside main boundary walls are only 4½in. thick, and the principal walls of the big swimming-baths are only 9in. thick with piers. A principal staircase leading to the gallery is cut across the second-class bath at a height of 7ft. 6in. at the highest point, and at less than 4ft. over one of the baths. There are no attendants' rooms to either of the three sets of slipper-baths, and there is no "control" or general towel store, so strongly demanded in the instructions, to be found anywhere. The boiler-room, engineers' shop, coal place, and engine-room are all placed 7ft. 6in. below Brayford head, and therefore located a long way below flood level, and if this river water has to be kept out, very thick walls, not shown, would be absolutely required. If this were done, room would not remain to receive the boilers, and they could not be got in or out of the boiler-room in any case. The figured dimensions, we understand, do not bear out when the plans are scaled:—"Lincoln, May 4, 1896. To Mr. H. K. Hebb, Deputy Town Clerk, Lincoln. Lincoln Public Baths Competition. Dear Sir,—We, the undersigned competitors, understanding that the award of Mr. Rowland Plumb, the assessor, will be brought up for confirmation at the meeting of the urban sanitary authority of the city, beg leave to offer our protest against the assessor's award in placing the plans numbered 5 first in the competition. We offer this protest on the grounds that both the swimming-baths are drawn and figured on the plans of less sizes than those specified for them in the conditions and schedule of the instructions, and also that the plans are drawn in violation of the Building By-laws of the city. There are many other evasions of the conditions and local by-laws which we need not mention here. In justification of our objection, we direct attention to clause 7 of the conditions, which states 'that the plans must provide all the rooms, &c., detailed in the schedule, and must contain the minimum areas and sizes therein set forth.' And clause 11 states 'that the plans must be in accordance with the City of Lincoln Building and Sanitary By-laws.' Notwithstanding this clause, some of the outside walls are only 4½in. thick, whilst others which ought to be 14in. are only 9in. thick. Clause 18 states 'that the conditions

of the competition will be strictly enforced, and the designs not in compliance therewith will be excluded and returned to their authors as soon as such non-compliance has been ascertained and reported to the committee. The schedule and notes attached hereto, also the plan of the site, must all be taken to form part of the conditions and instructions to competitors.' We also direct attention to clause 3 of the schedule, which provides (when the figures there given are added together) for a second-class swimming-bath, 102ft. long by 47ft. wide, in the clear of the walls inside, whereas this bath is figured on the selected plan as 101ft. long by 46ft. wide. It is drawn, however, only about 43ft. wide at its north end, instead of 47ft. Clause 3 of the same schedule provided for a first-class swimming bath, 81ft. long by 40ft. wide, also in the clear of the walls inside, whereas this bath is figured on the plans to be only 80ft. long by 39ft. wide. We desire to point out that it is impossible to produce a plan like that selected, which shall be in accordance with the conditions, without making the reductions in the areas and sizes of the baths which we have named, because the site is not only too narrow, but too short also to admit of it. This violation of the conditions of the competition has given the authors of the plans selected considerable advantage over all the other competitors, and we are, therefore, left with no alternative but to make this protest against the award."

**NORTHAMPTON.**—The town council received, on Monday, a report from the cemetery committee, stating that six sets of plans had been sent in for the chapel and lodge at the new cemetery in Towcester-road. They were signed, "Experience," "Spectre," "XX," "Queen Eleanor," "Well Considered," and "Symmetry." The committee recommended the design marked "Well Considered" for adoption, and that marked "Experience" for second prize. The committee unanimously recommended that the winner be instructed to carry out the work, the second prize-winner be awarded £10, and the other competitors £5 each. The mayor read the names of the competitors as follows:—Accepted design, "Well Considered," Mr. H. Norman, Swan-yard Chambers; second premium, "Experience," Mr. F. Dorman, Dergate. The other competitors, who each received an honorarium of £5, were "Spectre," Mr. H. H. Dyer, Sheep-street; "Symmetry," Messrs. Piccaver and Butcher, Wood Hill; "XX," Messrs. Ingman and Shaw, George-row; and "Queen Eleanor," Messrs. Mosley and Anderson, Goodyear Chambers; all of Northampton. The designs have been on view during the week in the upper assembly room at the town hall. The selected design for a chapel shows a Gothic building to be carried out in hammer-dressed stonework, with Bath stone dressings, and to have a tiled roof. Over the west gable is a bell-turret. The lodge is to be built of similar materials to those to be used in the construction of the chapel, and it is designed in harmony with that structure. On the ground floor an office, sitting-room, living-room, kitchen, and scullery have been provided; and on the first floor are four bedrooms.

The foundation-stone of a new church about to be erected by the congregation of St. Joseph's Roman Catholic Mission was laid in Gordon-road, Derby, on Wednesday week. The cost, including the furniture and fittings, is estimated to be £3,000. The structure will be of brick with stone dressings.

The work of restoring the Stadion at Athens in marble has been resumed, and the temporary seats constructed for the Olympic Games are being removed. M. Averoff is prepared to furnish the large sum requisite for complete restoration. The arena will be excavated, and it is hoped that some valuable remnants of the ancient structure will be brought to light.

The town council of Leicester, at their last meeting, unanimously adopted a report recommending that as the first step towards the proposed enlargement of the borough lunatic asylum, an area of 31 acres of land adjoining the east side of the asylum be purchased for £9,200. The asylums committee were authorised to obtain "architectural advice, local or otherwise," for adding a wing to accommodate 300 or 350 patients on the site thus acquired, together with stables and other buildings. At the same meeting it was decided to apply to the Local Government Board for sanction to borrow £12,000 for repaving various streets with concrete and asphalt, and plans by Mr. A. H. Hind were adopted for the enlargement of the baths in Bath-lane, at an estimated cost of £3,600.

## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 6s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—W. R. Farman.—J. S. P.—G. B. and Co.—Salopian.—F. W.—E. D. A. Co.

## "BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Pantile," "Perseverance," "Kaffir," "Moor," "Jackdaw," "Mac," "Tadpole."

The last subject for this session's work will be given in next week's BUILDING NEWS.

## Correspondence.

## ARCHITECTS' CERTIFICATES FOR ADVANCES HELD NOT ENFORCEABLE.

To the Editor of the BUILDING NEWS.

SIR,—I inclose report of a case\* heard at the Mayor's Court, Guildhall, on Friday last, in which the Common Serjeant decided that architects' certificates for advances are not binding upon the person who has contracted to pay money upon a certificate being granted; but that he may, from mere caprice, or without assigning any reason, refuse to pay the amount certified to be due from him, leaving the builder no remedy other than an action for damages for breach of contract.

It must be obvious to all that the results of this decision will be to entirely destroy the value which has hitherto attached to an architect's certificate, and to reduce the status of the architect from that of an honourable and independent umpire, whose certificate has hitherto been regarded as binding alike upon both builder and owner, and who therefore both equally respected him, to that of a mere instrument in the hands of the latter, capable of repudiation at the caprice of a person whose motives or interest may prompt him to risk the uncertainties of an action for breach of contract. Until this decision is reversed, builders and the public must estimate architects' certificates at Sir F. Fulton's valuation—i.e., *nil*—and therefore I venture to submit

\* See report on p. 694 post.



that the honour and interests of their profession are concerned to procure its reversal.

To builders the consequences are even more striking in practical results. The assurance of receiving a fixed sum of money, agreed between owner and builder, to be paid upon an architect's certificate being granted, on which the builder could, if desirable, raise money from solicitors, bankers, and others, is suddenly swept away, and the only substitute offered is an action for breach of contract, which may easily be defeated by methods too numerous to describe, but which can be readily conceived.

My personal interest as the plaintiff is comparatively small; the assignment of the certificate in question to me was by writing under seal, and contained the usual covenant for title by the assignor, which, on my failure to recover from the supposed debtor, entitles me to recover back my purchase-money from the assignor, and to be indemnified by him against loss. I am, however, willing, if the persons interested—viz., builders, architects, and surveyors—will provide the funds, to carry the case on appeal to the Queen's Bench Division, where I am advised by counsel there is no probability of the decision being upheld. I estimate the cost of an appeal, with suitable fees to counsel, at less than £100, and shall be happy to act with a committee of representatives of the persons whose interests are affected. As the time for appealing is very limited, if any steps are to be taken they must be promptly commenced.—I am, &c., H. ANDERSON.

5, Mitre-court (opposite Fetter-lane), Temple, London, E.C., May 4.

[It is certainly desirable that this decision should be tested. Could not the Society of Architects take this matter up, and act in conjunction with Mr. Anderson?—ED.]

#### COMPETITION FOR NEW ENGLISH PRESBYTERIAN COLLEGE AT CAMBRIDGE.

SIR,—My attention has only just been directed to the notice in your issue of the 10th of April of this competition. I greatly regret to note the omission of the name of my friend, Mr. Arthur R. G. Fenning, F.R.I.B.A., who was the joint author of the second premiated design. The omission is doubtless purely accidental, but I shall be greatly obliged by your kind insertion of this letter correcting the mistake in your next issue.—I am, &c., W. H. SETH-SMITH.

46, Lincoln's Inn-fields, London, W.C., May 2.

#### STRENGTH OF BRICKWORK PIERS.

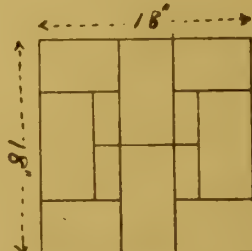
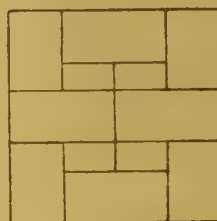
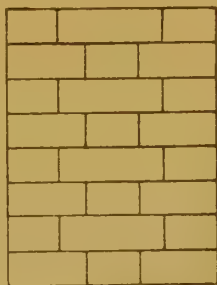
SIR,—Replying to your correspondent writing under the heading "Brick Bond" in your issue of the 25th April, and in which he seems to take exception to some of my remarks at the R.I.B.A.'s meeting, as reported in the "B.N." of April 3rd, I would like to remind him that the tests and discussion arising thereon dealt exclusively with piers, and that whatever may have been said of walls was by way of mere analogy. If he will refer to the diagrams showing the results of the tests, published in the *Journal* of the R.I.B.A., April 2nd, he will at once see that the use of the closure, and the multiplicity of vertical joints entailed by its use in an 18in. by 18in. pier, built in old English bond, constituted the chief cause of failure under a compressive strain.

The fact that a 14in. by 14in. pier, built with no closers, having 55½ per cent. less vertical joints and 39½ per cent. less area than an 18in. by 18in. pier, "proved fully 25 per cent. stronger in proportion to its area than the 18in. pier," fully justifies this conclusion.

American bricks are 8in. by 4in., and, as a rule, harder and better, not "broader and better," as reported, than English bricks. However good the bricks and brickwork of the Midland Grand Hotel may be, and I have admired both many times, I know no bricks in this country equal, in my opinion, to the red facing bricks of Baltimore, U.S. We must not allow our judgment to be warped by our patriotism.

It is not a question whether 4½in. bond pure and simple is better than English bond (i.e., 2½in. bond), but rather whether the bricks should be so arranged that some of the courses will lap or bond 4½in. in the line of direction of the wall, and thus, by reducing the number of transverse joints, reduce the possibility of fracture across the wall—the direction in which fractures generally occur—as well as distributing any weight on a given point of the wall over a larger bearing area?

In old English bond the maximum strength is in the direction of the minimum strain, and *vice-versa*. The annexed sketch is an 18in. by 18in.



pier in Dutch bond, asked for by your correspondent, Mr. H. J. Blake, which, I think, answers all his questions.—I am, &c.,

F. WALKER, Clerk of Works.

#### TOXIC ACTION OF TEAK.

SIR,—In a paragraph (p. 653) in your issue of 1st inst., you comment on a statement in the *Lancet* of a person who averred that, when working teak wood his experience was that on no occasion did he ever have a splinter to penetrate his flesh but that it caused severe inflammation and the formation of pus. You ask your readers for further information, and desire to know whether this effect is peculiar to the individual idiosyncrasy or whether it is general. In the time (alas! now departed) when ship-building was a staple industry on the Thames at East London, the poisonous nature of teak was common knowledge amongst the wood-workers there. To this acrid and bitter poisonous quality the lasting nature of the wood is probably due, as neither worm nor fungus can feed on this timber. I have asked a Mr. Jasper, a builder at Hackney, E., for information. He formerly worked at Samuda's ship-yard, Millwall. He says that he never was wounded by teak splinter but that severe inflammation supervened, and that that was the common experience of his fellow-workers. *Vide* Stevenson's "Wood as a Constructive Material," in which he refers to the extreme durability of the heart-wood (and in some cases of the sap-wood) of these trees, in which the secretory matter is bitter, acrid, pungent, and poisonous, and is repugnant to animal and vegetable life, as compared with that of other trees in which it is of a sweet or palatable nature.—I am, &c.,

A. H. (C. and A. Harston.)

15, Leadenhall-street, E.C.

SIR,—It is quite correct that teak poisons the blood to a slight degree, causing a little irritation if a splinter pierces the skin. That is well known in our shops, and, I think, generally. Further, there is a sort of grit in the stuff that sparkles, which takes the keen edge off the best tool very quickly.—I am, &c., HARRY HEMS.

#### ARCHITECTS' QUANTITIES.

SIR,—Your last week's correspondent on this topic seems to have neared the mark. These

documents frequently bristle with what are known as "sporting items," and as frequently the value of open tender is neutralised or vitiated thereby. Pretty generally, also, they contain a clause drafted on the "contracting-out" principle, which, in the event of error, throws the responsibility upon the builder. The latter may in some cases be required within a brief time to satisfy himself as to what they contain, but it is tolerably certain that should errors be detected at the outset he would, in many instances, be asked or required to withdraw, without compensation for the trouble to which he had been put.

The architects' views are, in the first place, limited by the circumstances of his own practice, and it therefore becomes a case of "so many men, so many minds," each one following out his own "doxy," modified, it may be, from time to time, according to the light of his own narrower experience, but not grounded upon well-established general principles; the system tends, in fact, to the non-survival of the fittest.

In the North the custom of architects supplying quantities for their own works obtains to a probably greater extent than elsewhere, and a friend of mine who practises there tells me that one-half his business as a quantity surveyor consists in rectifying architects' bills of quantities—only, however, after the mischief has become patent, and the contractor has found them untrustworthy. In one case which he cited, a builder stood to lose about 30 per cent. of the whole amount of his contract, and as there were few "authorised extras," it became necessary to investigate the basis of contract, and deficiencies were revealed in the architect's quantities. My friend had no difficulty in preparing a bill which, if it did not achieve all that might be desired, at least reduced the builder's loss to about 5 per cent., and he was glad to get out at that—no doubt wishing he had never touched the contract. It may be said that the business passed off amicably, as the architect was a man of experience, and fair-minded; still, the cases in which an architect would have the courage to present his client with a bill of extras amounting to 25 per cent. of the contract sum without corresponding additions in work, must be rare indeed, and in the case of younger men still more so. Also it may be observed that when the supplementary items were discussed, the only explanation afforded by the architect was that "he had never measured such items in the course of his practice of something over a quarter of a century"; yet, on consideration, he accepted the bill virtually as rendered.

It must, I think, be conceded that business of this kind could not be looked upon with satisfaction by any one of the four parties;—by the client, who had largely exceeded his expenditure; by the architect, whose prestige must have suffered in some degree; by the builder, who had worked for less than nothing; or by the surveyor, who would doubtless have preferred more legitimate and pleasant occupation. And it is to be feared that the custom tends to create work of this class; making quantity surveyors, when representing builders, into necessary evils, whereas their function should have in it something of a judicial character—i.e., they should work with the confidence of both sides.

It is also true that prices are enhanced under such conditions. I have heard of a case where an architect so drafted an item as to include work which had in all probability been charged to him previously as an extra; in consequence, the cost of the extra went up no less than 200 per cent., but he knew no better. His item had become a "sporting item," and the builder naturally enough declined the risk.

I have met, too, with such a description as Mr. Kinder gives—viz., "Counter so many feet long," which included some expensive underfittings. Its true value was not disclosed; but I shall not be far from the mark if I say that the builder added a cool 50 per cent., and no doubt his competitors would take a similar view. One or two instances in mind in which the architect was also building-owner would press my remarks still further; but I forbear saying more than this: that the outcome did not suit the builder's ledger account, though future business might, perhaps, be looked to to redress matters to some extent. The builders may have been lenient; but on the face of it they could scarcely afford to conduct their general business on similar lines.

In the best interests of all parties, it would seem that a system which makes the architect appraise the value of his own work is in the long



run unlikely to prove sound or commendable, even if he were better qualified than appears generally the case.—I am, &c., SIGMA.

### CONTRACTS AND QUANTITIES.

SIR,—I have read with interest your article on "Contracts and Quantities," in issue of April 24, and also Mr. A. H. Kinder's letter on same in your last.

As to whether the architect who prepares the plans or an outside surveyor is the most competent person to take off a set of quantities that shall fairly represent the amount of work in a building, opens up another question; and that, to my mind, a much more important one—viz., the way or method by which such quantities should be taken. Look at any half-dozen bills of quantities, and you will find, almost without a doubt, that each surveyor or architect has adopted a different system; and it is this want of a uniform system or method that is the chief difficulty in estimating.

What is required more than anything else in this question of quantities is that a proper school of quantity surveying or measuring be established, and that only proficient in the same be allowed to practice. Extras are the bugbear of the respectable builder, as they are of his client; but it is only by careful description and accurate measuring of the work that it is intended by the plans should be carried out, that these can be avoided.—I am, &c., J. S. B.

Sir,—Having read with interest your article of April 24th on the question of quantities and contracts, and Mr. Kinder's letter in last week's issue, perhaps you will permit me, as a country contractor of many years' experience, to state my views.

In the main, I concur with what Mr. Kinder says. Some of his statements may seem exaggerated to the verge of absurdity, yet at the present time I am pricing out a set of quantities in which items such as "No. 8 gullies fixed complete," without size or further description, appear almost on every page, and since Christmas I have tendered for a job in which one item was "One set of steps to back door," and another "One stairs complete from ground floor to first floor as detail drawing." This almost exactly tallies with Mr. Kinder's statements, and had I time I could cull similar absurdities from architects' quantities to fill columns of your space; but every country contractor amongst your readers can bear out my statements from his own experience. Whatever may be said in favour of architects taking out their own quantities, surely little can be said in extenuation of their audacity in charging a high percentage—as they usually do—for quantities of this description.

My experience as to the large discrepancy in estimates owing to unsatisfactory bills of quantities is also in accordance with what Mr. Kinder states. The items are more comprehensive and speculative in architects' bills, and one never knows precisely "Where 'e are," whereas with a carefully prepared bill of quantities, closer prices and better tendering is the result. Only last month I saw a list of tenders for an important job in one of the S.E. counties, the highest being £58,000 and the lowest £39,000. For a plain, straightforward job I think this will be hard to beat, and the difference was attributed by one of the parties tendering to the vague and unsatisfactory way in which the quantities had been prepared—needless to add, by the architect himself.

With regard to your remarks about settling up of contracts, I can only say that from a contractor's point of view, the fact of the quantities being the architect's does not tend to an amicable settlement. I always find that the worse the quantities are, the more architects resent their being called in question, and seem almost to regard as an insult the pointing out of any inaccuracy. This is poor, weak human nature, perhaps, but it is not business, and leads to an amount of friction and arbitrary unfairness at times which is deplorable from whatever point of view it may be regarded. Can you wonder that I emphatically uphold the professional surveyor? I enclose my card.—I am, &c.,

MAY 5. A COUNTRY CONTRACTOR.

A new Roman Catholic chapel is about to be erected in Little Queen-street, near the Colne railway station. It will have accommodation for 1,500 persons.

## Intercommunication.

### QUESTIONS.

[11506].—Arch Moulding.—I find it very difficult to measure an arch moulding similar to above, and should be grateful if some practical reader would inform me



exactly how it should be done. Of course, I mean to get a truly accurate drawing of same. If he would kindly mark in the exact measurements that should be taken, I should be obliged.—MASON.

[11507].—Distemper for Walls.—What is the best thing to use? I particularly want something that will not come off when it is washed—ordinary distemper, I believe, does.—DISTEMPER.

### REPLIES.

[11500].—King-Post Truss.—It is impossible to draw the reciprocal diagram for any form of truss unless the external forces to which it is exposed are clearly defined. Hence the first thing to do in answering the proposed question is to assume some such method of loading as indicated in the annexed sketch. The stress

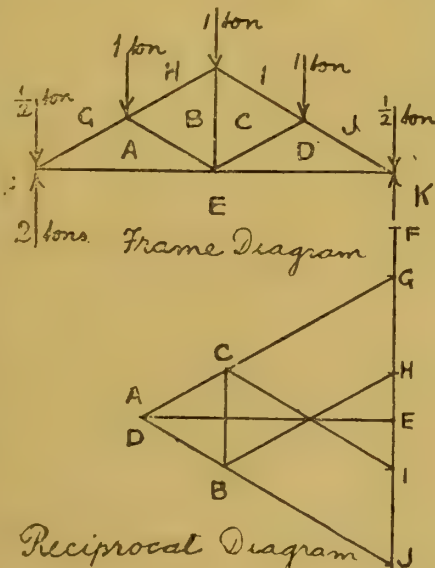


diagram can then be proceeded with by setting off to scale the various loads—FG, GH, HI, IJ, and JK, and the reactions KE and EF—vertically on the load line. Then by going round each joint of the truss, and drawing lines in the stress diagram parallel to each line in the frame diagram, the required figure is obtained.—H. BUSBRIDGE.

[11500].—King-Post Truss.—The reciprocal diagram for stresses in a king-post truss is given in nearly every textbook on the subject—Professor Rankine's manual of "Applied Mechanics," Bow's work on Graphic Statics, Middleton's work, and in several treatises which I cannot now remember.—G. H. G.

[11501].—Brickwork and Timber-Framing.—In measuring the plastering of a timber-framed gable, such as is given, I should certainly consider that the labour of forming the panels would equal the spaces taken up by the timbers. Therefore, I think the labour should be taken over the surface of the gable, without deducting the timbers. Other opinions would be useful on this question; but my opinion is that most measuring surveyors would adopt the plan suggested.—G. H. G.

[11502].—Noiseless Paving for Stables.—I am not aware of any noiseless paving, except, perhaps, cork. I should say well-croseted wooden blocks would be sufficiently noiseless for the purpose. G. Birchmore's suggestion to use some deafening material, such as silicate cotton, to the walls of the sitting-room is the most reasonable plan, or build the wall hollow.—G. H. G.

Mr. Young, Minister for Works, New South Wales, proposes to invite architects to send in competitive designs for a new Parliament House worthy of the colony. The competition is to be open to the whole world. A board will be appointed to draw up conditions and judge the designs when sent in.

## Legal.

### ENTRANCES TO NEW STREETS.

IN laying out land for building purposes it is, of course, essential that the intended roads or streets should be of the width required by the by-laws in force in the district in question. It is also necessary that the entrances to these new streets should be up to the necessary measurement. Such a rule may even apply although the new street is a continuation of an older and narrower one, though it hardly seems a reasonable application. This point was recently considered in the case of "District Council of Barton Regis v. Stevens" (Times, April 28). There the by-laws made by the plaintiffs under the Public Health Act, 1875, provided that every new street which was intended for a carriage road should be at least 36ft. wide; and, further, that every person who shall construct a new street shall provide at one end at least of such street an entrance of a width equal to the width of such street, and open from the ground upwards. In this case the new street was intended to join an old street only 30ft. wide, while at the other end it would abut upon inclosed grounds. As the new street was to be 36ft. wide, as required by the by-law, its entrance also should have been of street width, whereas it was only 30ft., and there seemed no way by which it could be altered.

Baron Pollock and Justice Kennedy were the judges in the Divisional Court before whom this case came up for decision. After some doubt they held that the plaintiffs were right, and that the defendant had not complied with the by-laws as to the width of the entrance to the new street. They admitted that these provisos might, and did, occasionally work hardship upon individuals. But as the Public Health Act, and the regulations made under it, were for the public good, the true answer was that if a building owner, in carrying out the proposed plan for developing his estate, could not comply with the by-laws made under the Act, he must alter his scheme of development so as to make it in accordance with their requirements. In this case it would seem that the only way out of the difficulty would be to make an entrance at the other end of the new street proposed, if that is possible.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

### CHIPS.

A large amount of business was done at Tokenhouse Yard last week, chiefly in freehold ground-rents, the total amount reported being £112,539.

On Saturday the Bishop of Hereford dedicated the new mission church of St. Mary, which has been erected at Long Bank, two miles from Bewdley. The church, which is of red brick, will seat about 120 persons.

An isolation infirmary is about to be added to the imbecile asylum at Caterham, from plans by Mr. E. T. Hall, F.R.I.B.A., of Moorgate-street, E.C.

The Canterbury Town Council decided on Saturday to adopt the electric light, and appointed an engineer to prepare plans for the necessary works. They also agreed to apply to the Local Government Board for authority to raise a loan of £20,000 for the purpose. It is expected that the Cathedral will be one of the first buildings in the city to be illuminated by electricity.

Kelvinside United Presbyterian Church, newly erected at the corner of Queen Margaret Drive and Kelbourne-street, Glasgow, was opened on Saturday. The edifice cost £5,000, and has been built from designs by Mr. John B. Wilson, of Glasgow. The style is Late Decorated, and accommodation is found for 750 persons, of whom 500 are in the main area, and the others in narrow side and end galleries, carried on cantilevers without supporting columns.

The North British Railway Company having obtained Parliamentary powers for the doubling of their line between Arbroath and Montrose, a commencement of the work was made last week. It was constructed as a single line when the first Tay Bridge was built, and is about 12 miles long. The widening of the line has been commenced six miles between Arbroath and Inverkeilor. The work will be comparatively easy; but the bridges at Lunan Bay, Inverkeilor, and Montrose will have to be widened.



## LEGAL INTELLIGENCE.

"BLACK LISTS" OF WORKMEN.—TROLLOPE AND SONS AND OTHERS v. THE LONDON BUILDING CONFEDERATION AND OTHERS.—In this important case, judgment was given by Mr. Justice Hawkins on Monday last. We gave a report of the case, the hearing of which was commenced on Tuesday week, in our last issue, p. 655. The plaintiffs, a well-known firm of builders and contractors, sued the defendants for damages and an injunction to restrain the defendants from continuing the publication of a black list, which, it was alleged, was injurious to the interests of the several plaintiffs. The black list in question was a yellow poster, some 3ft. by 2ft., edged with black, and contained the names of various workmen who had worked in contravention of the defendants' rules. The defendants admitted the publication of the black list, but pleaded on various grounds that its publication was justified under the law as it is, and that everything it stated was true in fact, and that it was published without malice and in the legitimate and *bona fide* interests of the defendant organisation. The witnesses called on the latter days of the hearing included on the plaintiffs' side George Howard Trollope, a member of the plaintiffs' firm; Charles William Eves, a sub-contractor under them; William Locke, bricklayer (known as the "King of the Blacks"); John Mowlem Burt, contractor; and Oliver, a bricklayer specially named in the black list. For the defendants the witnesses included Joseph Verdon, the secretary of the London Building Trades Federation, Purcell, Blackman, Richard Goring, and Walter Bell, bricklayers who went on strike in October, 1894, and were afterwards refused work by Iliff, a foreman under Eves. These and other witnesses were called for the defence, to show that union men had been refused work by the plaintiffs and their foremen, when non-union men who applied at the same time were engaged. In summing up the case on Monday, Mr. Justice Hawkins laid down the dictum that no man had a right to coerce another man as to the way in which he should employ labour or seek employment. The jury returned a verdict that the list was published maliciously and vindictively, and that it was calculated to injure, and did injure, the plaintiffs and their workmen. After some discussion, the damages were fixed at £500, subject to an arrangement between the parties, and a perpetual injunction was granted.

ARCHITECT'S CERTIFICATES FOR ADVANCES HELD NOT ENFORCEABLE.—On Friday, the 1st inst., the case of Anderson v. Muggeridge was heard in the Mayor's Court, Guildhall, before the Common Serjeant, Sir F. Fulton, Q.C., and a jury. Mr. Warburton was counsel for plaintiff; Mr. Bullen, barrister, appeared for defendant. Mr. Warburton stated that his client, Mr. H. Anderson, the plaintiff, was a solicitor in practice at 5, Mitre-court, Fleet-street, and he sued the defendant, Mr. Frederick Muggeridge, a gentleman residing at Hayter-road, Brixton, to recover the sum of £27 18s. (as assignees of William Hammer, a builder), being the amount of an architect's certificate, less two guineas, the charges of the freeholder's architect and solicitors. The circumstances of the case were that in October last Mr. Hammer entered into a building agreement with the defendant to erect seven houses on land belonging to defendant at Peckham Rye on the usual terms of leases for 99 years being granted to Hammer at ground rents payable to the defendant, with the reversion of the entire property to him at the termination of the lease. Hammer was without funds, and applied to his solicitor, Mr. Anderson, to assist him. The plaintiff agreed to do so, and paid the freeholder's solicitors' charges for the agreement, and also provided him with money to commence the building. On November 30 last Hammer executed a mortgage of the building agreement to the defendant, the freeholder, to secure the sum of £60 and further advances to be made to him from time to time not exceeding £1,040 in all, such advances to be paid upon the certificates of the defendant's architect at certain stages of the work. A number of certificates were given and duly paid by the defendant's solicitors; but on 20th March last a certificate for £30 was given by the architect, and on payment being applied for by Hammer, no money was forthcoming, and defendant admitted in his answers to interrogatories that at the time when Hammer applied for payment to defendant's solicitors they had no money in hand belonging to defendant to meet it. Hammer then assigned the certificate in question to his solicitor, Mr. Anderson, who paid him the full amount for it, £27 18s., took an assignment of the certificate in writing, and gave notice of the assignment by registered letter to defendant. The plaintiff and Mr. Hammer were called, and gave evidence in accordance with the statement of the learned counsel. Mr. Bullen, counsel for the defendant, admitted all the facts as related on behalf of the plaintiff. He called no witnesses, but submitted, on the authority of the case of "Western Waggon Company v. West," L. Ch. 271, that an agreement to lend money or to make further advances did not constitute a debt or chose in action, and that defendant could not be compelled to pay the amount of his architect's certificate if he thought

proper not to do so. Mr. Warburton submitted that the case cited did not apply to the present action, inasmuch as the entire contract had not been assigned, but only one certificate for work which had been actually done and materials used, and there were other essential differences between the two cases; but the learned Judge pronounced judgment of non-suit against the plaintiff with costs, and refused Mr. Warburton's application to allow the jury to find a verdict, but stayed execution pending an appeal to the Queen's Bench Division, which, it is understood, will be entered at once.

THE CENTRAL LONDON RAILWAY STATIONS.—At the Guildhall, Westminster, on Saturday, before Mr. Troutbeck, the Deputy High Bailiff of Westminster, and a jury, the case of "The Rev. C. G. Anderson v. the Central London Railway Company" came on for hearing. It was a claim against the company for the sum of £3,464 as compensation for freehold premises, No. 15, Argyll-street, Oxford-street, required by the company for the construction of the Oxford-circus Railway Station. The property is freehold, and situated one door from Oxford-street and within 60 yards of Oxford-circus, and comprised a house and shop and workshops in the rear, and trade entrance on the north of No. 16, Argyll-street. The building covered an area of 1,772ft., taken as being worth a ground rent of £310 per annum, valued in perpetuity, at 3½ per cent., at £8,835; deduct £1,140 in respect of £80 per annum for 20½ years, the unexpired term in the lease—£7,695; making, with 10 per cent. for compulsory sale, £8,464. Mr. Robert Reed gave evidence in support of the claim. Sir J. Whitaker Ellis and Mr. F. T. Galeworthy confirmed the figures. For the company, Mr. Watney, president of the Surveyors' Institution, Mr. Garrard, Mr. Howard Martin, and Mr. Rushworth were called as witnesses, and they put the full value of the premises at £1,600, being 20 years' purchase of the rent of £230, plus 10 per cent. for compulsory sale—5,060. The jury assessed the compensation at £8,085.

ARCHITECT'S LIABILITIES.—YATES v. WILSON.—In this case, heard on April 29 in the City of London Court by Mr. Commissioner Kerr and a jury, the plaintiffs, Messrs. Yates, Haywood, and Co., iron merchants, sued Mr. T. Wilson, architect, for £38 2s. 5d. for stoves, &c., supplied. The plaintiffs' case was that the defendant ordered the stoves, and said they were to be credited to one Ridout, a builder. That was done, and now the defendant would not pay for the goods. The defendant said that he was not personally liable. He went to the plaintiffs to select stoves, which he had paid Ridout for, and he made the selection on Ridout's behalf. He had done the same before. The plaintiffs denied that the defendant had ever dealt with them, and asserted that the goods were sold to the defendant, and not to Ridout, about whom they knew absolutely nothing. The jury found for the defendant.

BUILDER AND SUB-CONTRACTORS.—At Highgate Police-court, on Monday, William Hudson, builder, of Hoe-street, Walthamstow, was sued for wages claimed by five workmen—viz., £1 1s. 4½d. claimed by William James Fearey, £1 9s. 3d. by George Smith, £1 16s. 5d. by Edward James Henderson, £1 15s. 7d. by Frederick George Crook, and £1 17s. by Frederick Colman. William James Fearey deposed that there had been a building agreement between Mr. Hudson and himself. On or about March 20 he went to Mr. Hudson, and told him he could not proceed further under that agreement, as he had expended all his money. Mr. Hudson said, "Go along; I will send in the stuff and pay the wages." Witness produced a postcard from Mr. Hudson undertaking to pay the men's wages. There had been an alteration in the building agreement. Mr. Carrington (for defendants): That agreement forms the subject of a claim in the High Court for £600 made against my client by Fearey. On April 13 Fearey issued a writ against Mr. Hudson under this very agreement. My client holds Fearey's I.O.U.'s for the amounts which have already been paid. Fearey: The wages have been paid for four weeks. On the strength of Mr. Hudson's postcard, the men did the work. Mr. Carrington: This man entered into an ordinary agreement by which he built houses, and my client advanced money on them. Afterwards he agreed to advance money to pay the wages; but he was not the principal. He is willing to pay the other men's wages, but not Fearey's, if he will sign a receipt for the amount as a further advance. The men are poor men, and he is anxious that they should be paid. On Fearey's signing a request for payment without prejudice to the other case, Mr. Hudson paid the amounts due to the four other men. The Bench then dismissed Fearey's summons, and the other summonses were withdrawn.

PULLING DOWN HOUSES.—WHARTON v. GUDE AND SON.—This case was heard on Saturday and Monday in the Queen's Bench Division, before Mr. Justice Hawkins and a special jury. The defendants in the spring of last year were employed by the Hornsey School Board to pull down 27 houses, some of which were opposite to a house which belonged to the plaintiff in Woodstock-road, Finsbury-park.

The plaintiff complained that two of the party-walls were pushed down bodily, and that the consequence was that the plaintiff's house was shaken, walls and ceilings were cracked, and the building was otherwise seriously injured. Another complaint was that, in consequence of there not being a proper hoarding, some of the furniture in the house of the plaintiff was seriously injured. For the defence, it was said that the work of pulling down was carried on in the ordinary and proper way, and that there was no likelihood that the throwing down the walls, or the absence of a hoarding, would cause any injury to the property of the plaintiff. The jury gave a verdict for the plaintiff for £30.

## CHIPS.

A sum of £1,500 is being expended on the nave of the ancient parish church of Llanfihangel-y-Beguildy, in North Radnorshire, while at Llanbedr, in South Radnorshire, the parish church is being restored at a cost of £1,000, of which £800 has been subscribed.

The Middlesbrough School Board have agreed to build new central schools to accommodate 1,400 children, the cost of which, it is estimated, will be nearly £20,000. A deputation having inspected central hall schools at Leeds and York, recommended on Tuesday the building of a school similar to one at York. The proposal to rescind the resolution passed by the board appointing Mr. Bottomley, of Middlesbrough and Leeds, architect, was then considered, and was negatived.

The 30th annual convention of the American Institute of Architects will open at Nashville, Tenn., on Tuesday, October 20, continuing three days. An important feature of the Convention this year is to be a general discussion on "The Influence of Iron and Steel Construction, and of Plate-Glass, on the Development of Modern Glass."

There died last week in London, from heart-disease, at the age of 75, Peter John Margary, one of the assistants of Isambard Kingdom Brunel in the construction of the Bristol and Exeter Railway, and subsequently of the South Devon line, of which and its branches he became chief engineer on the death of Brunel. On the amalgamation with the Great Western Company, Mr. Margary was appointed resident engineer of the western division of the system, a position he retained until 1891, when he retired from the service.

In the London Consistory Court on Wednesday, Dr. Tristram granted a faculty, authorising the erection of a reredos in the church of St. Paul, Kensington. The reredos contains a representation of the scene of the Crucifixion. In addition to the figure of Our Saviour, the size of which will be about 3ft. 10in., there are figures of the Apostles. The cost of the work will be about £600. A faculty was also granted for placing a statue of St. Paul in the west end of the church.

On Sunday, the first open day at the National Gallery, the number of visitors was 3,038. At the South Kensington Museum, in the main building and in the galleries west of Exhibition-road, the total attendance was 5,083.

The fine art and industrial exhibition at Cardiff was formally opened on Monday. The buildings have been erected from plans by Mr. Edwin Seward, R.C.A., of that town.

The foundation stone of the new town-hall at Hammersmith was laid yesterday (Thursday) afternoon by the Duke of Fife, K.T. The building is being erected in the Broadway and Brook Green-roads, from plans by Mr. J. H. Richardson, of Uxbridge-road, selected by Mr. W. Emerson in competition, and illustrated in our issue of May 4, 1894, by plans, elevation, and section. It will be Renaissance in style, and built of red bricks and Portland stone dressings.

A building occupied by Mr. White, builder and contractor, at 18, New Park-road, Brixton-hill, was completely destroyed by fire on Sunday evening. The flames did considerable damage to an adjoining building rented by Mr. F. W. Lucas, coach-builder, and used as a carriage store. The cause of the outbreak is unknown.

The city council of Birmingham, after some discussion, adopted on Tuesday the recommendation of the Public Works Committee already reported by us, for a rearrangement of the duties now devolving upon Mr. W. S. Till, as city surveyor and engineer, whereby Mr. Till will retain the office of city engineer, only in a consulting capacity, at a reduced salary of £500 per annum, and authorising the appointment of a city surveyor at a salary of £500 per annum.

At Southampton, on Wednesday week, the new wing attached to the headquarters of the Southampton Gordon Boys' Brigade, in Ogle-road, was opened by the Hon. Mrs. Eliot Yorke. The wing comprises a clothes room, kitchen, scullery, larder, and truck yard, the architects being Messrs. Mitchell, Son, and Gutteridge, and the builder, Mr. A. Warden, all of Southampton.



## PARLIAMENTARY NOTES.

**PROJECTIONS OVER FOOTWAYS.**—Mr. Pierpoint asked the Home Secretary on Tuesday what was the minimum height from the pavement at which awnings, lamps, and other things projecting over the footways in London might be placed; and whether he would cause the law in this matter to be carried into effect. Sir M. W. Ridley: There is no minimum height fixed by the Acts in force in the Metropolis. Awnings, lamps, and projections generally, which cause annoyance or obstruction can be dealt with either under section 60 of the Metropolitan Police Act, 1839, or by the vestry or district board under section 119 of the Metropolis Local Management Act, 1855. Heavy penalties are imposed by the latter Act for default in complying with an order of the vestry or district board for the removal or alteration of any such projection.

**NATIONAL PORTRAIT GALLERY.**—Mr. Lecky asked on Monday whether, in the event of the St. George's Barracks being removed, the Treasury would bear in mind the claim of the National Portrait Gallery to some portion of the ground with a view to future extensions. Mr. Balfour replied that negotiations are going on between the War Department, the Commissioners of the National Gallery, and the Treasury in regard to this site, but it will be three years before the barracks are vacated. At the end of that period part of the site will revert to the National Gallery, but the remainder will be still required for military purposes.

## CHIPS.

The Carpenters' and Joiners' Union of Winnipeg have sent a letter advising anyone making a living at home to stay there. At all events, say the union officials, Manitoba and North-West Territories should be avoided. In the city of Winnipeg labourers earn 9d. an hour, carpenters 1s. 2d. an hour, and bricklayers 1s. 8d. per hour. But they can only work six months in the year, and during the long winter have to eat up the fruits of their summer industry.

Mr. Alfred William Hunt, the distinguished artist in water-colours, died suddenly at his house on Camden Hill on Sunday, aged 65 years. Since 1854, when he first exhibited at the Academy, he had devoted himself to the portrayal of English landscapes in his favourite medium, confining himself to the localities of the Upper Thames, Rokeby, Robin Hood's Bay, and the Northumbrian coast.

The foundation-stone of a new public school being constructed on the site of the old High School, Leith Links, was laid on Saturday by the chairman of the Leith School Board. In the school, which is to be known as the Leith Academy, and which will cost £29,000, elementary, secondary, and technical education will be imparted, and accommodation will be provided for over 2,000 pupils. Mr. George Craig, Leith, is the architect; Messrs. Kinnear, Moodie, and Co., and Messrs. Drysdale and Gilmour, the contractors for carpentry and joinery.

A return presented to the London County Council shows that during the past year the total expenditure on technical education was £76,559, leaving a balance in hand of £49,610.

A new Wesleyan chapel is about to be built at Burley, near Leeds, from plans by Mr. G. F. Danby, of the latter city, at an estimated cost of £5,000.

The lighting committee have unanimously recommended the Bath town council to purchase the plant and buildings of the Bath Electric Light Company at £24,533, excluding the arc-lighting plant, lamps, and lamp-posts. The amount is based on the valuation of Professor Kennedy, the Board of Trade expert.

Christ Church, Plymouth, has just been renovated from plans by Messrs. Keats and Coath Adams, of that town. The contracts for seats, wood-flooring, ventilation, and drainage were carried out by Mr. A. Andrews, also of Plymouth.

New offices of the Inland Revenue Department and the bankruptcy department of the Board of Trade are about to be provided for Bristol. The plans for the building have been prepared in London, the contract has been let to Mr. G. H. Wilkins, of Bristol, and the undertaking will be carried out under the superintendence of Her Majesty's Office of Works at Bristol. The offices will have a frontage of 70ft. to Baldwin-street, and of 86ft. to a new thoroughfare from Baldwin-street to Marsh-street. The public Inland Revenue office will be 40ft. by 27ft., and 16ft. in height. The public office of the Official Receiver in Bankruptcy will be 40ft. by 19ft., and 15ft. high. On the first floor accommodation will be provided for the surveyors of taxes and their clerks, while in connection with the bankruptcy department there will be a large room for creditors' meetings, 32ft. by 19ft. The second floor will be devoted to the Inland Revenue department. The frontages will be of Bath stone, and the roof is to be covered with slate.

## Our Office Table.

By permission of the late Lord Leighton's sisters, and with their fullest sympathy, a meeting in support of the movement for purchasing for the nation the residence of the late President of the Royal Academy and its artistic contents will be held under the auspices of the National Trust for Places of Historic Interest and Beauty to-day (Friday), at 2.30 p.m., at 2, Holland Park-road, Kensington, Lord Leighton's residence. About £35,000 is required to be raised for acquiring the house and its unique art treasures. The members of the Architectural Association will visit the house to-morrow (Saturday) afternoon, meeting there at 3 p.m., when Professor Aitchison, A.R.A., President-nominate R.I.B.A., the architect of the house, will personally conduct the party over the building.

Writing in the *Lancet*, "M.R.C.S." says that, as the result of personal experience during five years' amateur cabinet-making in his spare time, he regards the assertions as to the evil effects of working in teak with absolute incredulity. He never knew any sort of skin affection to appear, while any incised wounds, if promptly and fairly closed and kept in apposition, invariably healed by first intention in a few hours, while splinter wounds and deep abrasions incidental to colonial "roughing" healed as usual without the least suppuration. He adds: "For purposes of instruction I frequently found myself in cabinet-makers' workshops; the men would often show me their minor ailments and injuries, even partial losses of digits, and not once did I see any eczema or other skin affection, or even any suppuration or delay beyond what would be expected in lacerated wounds, and the men never even suggested that when working in teak they were subject to any such disability or annoyance." Two letters on the subject by well-known contributors will be found in our "Correspondence Column."

EXTENSIVE alterations and additions have been made to the Three Nuns Hotel, Aldgate, from the designs of Mr. C. J. C. Pawley, 2, Princes-mansions, Victoria-street, Westminster, several new bedrooms and grand banqueting-halls having been added. The Queen's Room has been magnificently treated by Mr. J. M. Boekbinder, the decorations being painted tapestries representing the Three Nuns in various duties. The style is 16th-century Flemish Renaissance, even to the mantelpiece, the panelling and doors being of solid carved oak. The general contractors for the work were Messrs. Spencer and Co., Commercial-road, Lambeth; Messrs. Leggott and Sons supplied the ventilating fittings to the windows; the fireproof construction of the floors and windows has been carried out by the Banks's Fireproof Construction Company; and the sanitary fittings by Sir Henry Doulton and Co., of Lambeth. The origin of the name of the house is lost in obscurity; but it is believed to have been originally a priory, after which a hostelry sprang up on the spot, of which the present extensive premises are the development.

SOME newly-discovered mural paintings at Pompeii were described by Mr. Talfourd Ely, F.S.A., in a paper read before the Hellenic Society, on Monday afternoon, Professor Lewis Campbell in the chair. The paintings are evidently of various degrees of merit, some of them being clearly copies of older originals coming from a Hellenic source. Among the subjects are the strangling of serpents by Hercules, who appears a stalwart boy much older than the traditionally ascribed ten months. There is also a representation of Hero and Leander, and of the desertion of Ariadne by Theseus, of which latter subject Herulanum has always yielded many illustrations. A bearded Zeus also has been found, of which instances are very rare, though mention of such a form of representation is made in Pausanias. There is one example of Perseus and Andromeda, differing from the usual presentation of the latter as chained to a rock. Many of the pictures represent different trades, and of these some are of a very commonplace and realistic character. In others the work is represented in a more ideal fashion through the medium of little Erotes, who are depicted as carrying on the trades of dyeing, fulling, and oil-pressing, and in another instance in the act of coining money.

The Dean of Bristol, in a circular calling

attention to the urgent need of restoring the easternmost portion of the cathedral, points out that the restoration has thus far been effected by the contributions of fewer than 500 subscribers, out of a population of 280,000, which, he thinks, is not creditable to the inhabitants of a great and flourishing centre of industry such as Bristol. A hope is expressed that the remaining work may be taken in hand, not so much by second subscriptions on the part of those who have already contributed, as by gifts from those who, up to the present, have given nothing. It is proposed to carry out the restoration in sections, as the necessary funds shall be forthcoming, and the estimated cost is as follows: North choir aisle, £965; choir roof, £609; parapet to choir, aisles, and pinnacles, £527; east end from north to south aisles, £1,209; south choir aisle, £623; Newton Chapel, £299; and additional door to transept, £300; making a total of £4,532.

THE half-yearly meeting of the Scottish Building Trades Federation was held on Friday at the Building Trades Exchange, Gordon-street, Glasgow. Mr. David Heron, builder, Edinburgh, president, occupied the chair, and representatives were present from all the leading centres throughout the country. The secretary (Mr. James L. Selkirk, C.A.), submitted a report on the progress made in extending the influence of the Federation throughout the country, and in particular in assisting the formation of local associations in the various districts, which was cordially approved of, and satisfaction expressed that a large proportion of the principal towns and districts were already organised and affiliated. Arrangements were made for still further securing the organisation of employers in districts where none at present existed, in order that the Federation might be thoroughly national and representative. A committee was appointed to take into consideration the drafting of a form of contract as well as a mode of measurement adapted as far as possible for general use, and to report to next meeting.

THE National Association of Slate Merchants and Slaters held a two days' conference at Leicester on Wednesday and Thursday in last week. A reception was held on behalf of the mayor at the Council Chambers. Mr. A. B. Partridge, president of the association, in his introductory remarks, observed that members and delegates were there from London, Liverpool, Manchester, Leeds, Bradford, Newcastle-on-Tyne, Sunderland, North Shields, South Shields, Darlington, Middlesbrough, Hull, Grimsby, Huddersfield, Wakefield, Dewsbury, York, Sheffield, Nottingham, Derby, King's Lynn, Loughborough, Bristol, Port Madoc, Maryport, Bacup, Harrogate, Scarborough, and Leicester. Their association was similar in its operations and constructed on the same plan as the Master Builders' Association of England and the Association of Master Plumbers, and on similar lines to the Building Trades Federation. The secretary (Mr. J. Townsley, Hull) said that the slating trade had been degenerating owing to unskilled labour. As to the representative character of the association, they had members doing 70 per cent. of the slate trade. An adjournment was then made to the Co-operative Hall for the conference, at which the proceedings were private.

At last, after a weary wait of nearly three years, the Chicago World's Fair medals and diplomas are so far ready that on the 20th ultimo those awarded to German exhibitors were formally handed to Baron Thielmann, the German Ambassador. This was the first issue. Those for Great Britain and the Colonies, it is officially stated, will be ready for distribution by the end of May. The American papers claim that both medals and diplomas, in point of artistic merit, are superior to anything of the sort ever issued by other countries. The proof of the pudding is in the eating, and, if such be the case, American art must have made signal strides during the last twenty years. The medal issued by the United States Centennial Commission at Philadelphia in 1876, which bears the legend "H. Mitchell, Sc.," is about as miserable an example of the numismatic art as one can well conceive; whilst the diplomas themselves were printed by the National Bank-Note Company, New York, upon such wretchedly rotten paper that they almost fell to pieces in the mounting.

At the Surveyors' Institution professional examinations, held in London in March last, out of 137 successful candidates 62 were prepared by Mr. Richard Parry, being nearly one-half of the



successful list. In the various divisions Mr. Parry's results were as follows:—Division I. (preliminary), no examination; Division II., 100 per cent., including the first place and Institution Prize; Division III., 67 per cent., including the first place, Driver Prize, and Penfold Silver Medal; Division IV., 93 per cent.; Division V., 67 per cent. (in this division all the successful candidates took Mr. Parry's course of preparation). The percentage of passes this year is less than usual, 55 per cent. only of the whole number of candidates having been accepted.

#### MEETINGS FOR THE ENSUING WEEK.

- SATURDAY (to-morrow).**—Architectural Association. Visit to late Lord Leighton's House, 2, Holland Park-road, W. 3 p.m.  
St. Paul's Ecclesiastical Society. Visit to Churches of St. Michael, Camden Town, and St. Augustine, Highgate. Meet at St. Michael's Church, near Camden-road Station, N.L.R. 8 p.m.  
Edinburgh Architectural Association. Visit to Balgowrie Castle and Balfour House. From Waverley Station at 1.50 p.m.
- MONDAY.**—Surveyors' Institution. Adjourned discussion on "Landlord and Tenant in Ireland." 8 p.m.  
Society of Arts. "Applied Electro-Chemistry." Cantor Lecture No. 3, by Jas. Swinburne. 8 p.m.
- TUESDAY.**—Institution of Civil Engineers. Discussion on "Methods of Manufacturing Steel Plates." 8 p.m.  
Society of Arts. "The Future of the Fine Art of Wood Engraving," by W. Biscombe Gardner. 8 p.m.
- WEDNESDAY.**—Carpenters' Hall. Five Lectures. "The Framing and Construction of Partitions and Floors," by Professor T. Roger Smith, F.R.I.B.A. 8 p.m.  
Society of Arts. "Tunnelling by Compressed Air," by E. W. Moir. 8 p.m.
- THURSDAY.**—Society of Arts. "Tea Planting in Darjeeling," by G. W. Christison. 4.30 p.m.
- FRIDAY.**—Architectural Association. Members' Soirée at St. Martin's Town Hall, Charing Cross-road. New and original comic opera, "The Celestial Institute." 8 p.m.

#### CHIPS.

The partnership heretofore subsisting between J. F. Walsh and W. Wrigley, of Hebden-bridge, Yorkshire, architects and surveyors, under the style of Walsh and Wrigley, has been dissolved.

The town council of Glasgow have raised the salary of Mr. Paterson, fire master (*Anglicæ*, superintendent of city fire brigade), from £500 to £600 a year.

The members of the Edinburgh Architectural Society visited on Saturday afternoon the Roman Catholic church of St. Cuthbert, Slateford-row, in that city, which is approaching completion. The architect of the church, Mr. J. B. Bennett, received the visitors, and explained the special constructional features.

The extensions to St. Michael's schools, Sydenham, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

In making excavations for extensions at Esk Mills, near Eskbridge Station, on the Penicuik Railway, several stone cists have been found. One of the best defined of the series was unearthed on Saturday, being a "long cist," its length about 6ft., and the covering slab about 30in. across.

The new cemetery provided by the Hemsworth rural district council has been consecrated by the Bishop of Beverley. The cemetery has cost £2,700. It is situated near the town, is three acres in extent, and contains two chapels, with a lodge for the caretaker, all Gothic in style. The plans were prepared by Mr. Richardson, the architect and surveyor to the Hemsworth council.

An addition to the Prince's Landing Stage at Liverpool was placed in position on Tuesday. The work has been carried out by the Pearson and Knowles Coal and Iron Company, Limited, of Warrington, and by the Phoenix Foundry Co., of Derby. The teak decking has been prepared and laid by the Mersey Docks Board's own workmen. The new stage is 400ft. long, 80ft. wide, and the ironwork alone weighs 1,475 tons. It has been built at Birkenhead, on a teak deck floated on pontoons, like unto the old construction, and as fixed in position makes the great marine parade 2,463ft. in length, the largest of its kind in the world. A jetty at the south entrance to the Prince's Half-tide Dock is also being built.

In commemoration of the Silver Jubilee of the Archbishop of Cashel, a stained-glass window has been erected in the north transept of the church of the Sacred Heart, Templemore. The window has three lights, and represents "The Transfiguration," after Raphael's great picture at Rome.

## Trade News.

### WAGES MOVEMENTS.

THE DISPUTE IN THE LONDON BUILDING TRADES.—It is satisfactory to be able to report that the strike in the metropolitan building trades, which threatened to check operations at the busiest season of the year is practically over, the employers having agreed to concede an advance in wages of one halfpenny an hour all round, subject to a revision of the working rules. The difficulty with the bricklayers was settled at the end of last week, at a conference between the representatives of the Operative Bricklayers' Society and the Central Association of Master Builders, when it was agreed that, subject to a revision of the proposed working rules, the wages of the bricklayers be advanced one halfpenny per hour, and a revision of rules satisfactory to both parties was ultimately arrived at. The most important alteration is the framing of a new section providing that if any workman's presence is obnoxious to his fellow-workmen, no strike shall take place, but that the matter shall be referred to a conciliation board, which shall consist of three workmen and three employers and a neutral chairman, provided always that no objection shall be made against any man on the ground of his belonging to, or not belonging to, any trade society. On Wednesday afternoon two conferences took place between the representatives of the Central Association of Master Builders and those of the Amalgamated Association of Carpenters and Joiners and of the plasterers respectively. The employers offered the carpenters an advance in wages amounting to one halfpenny per hour on condition that a similar code of working rules to that which had been agreed upon by the bricklayers was assented to by their representatives. The carpenters objected to the new rule above quoted, which provides that no disability should attach to any workmen for belonging to, or not belonging to, any trade society; and they also objected to the rule which says that six months' notice on either side shall terminate the agreement. The conference has been adjourned until Wednesday next in order that the representatives of the carpenters can take the opinion of their several trade unions. A settlement was arrived at with the plasterers, the advance of one halfpenny and the new working rules being mutually agreed to. A conference between the plumbers and the builders' labourers and the master builders will take place this (Friday) afternoon.

ASHTON-UNDER-LYNE.—All the bricklayers' labourers in the Ashton-under-Lyne district came out on strike on Friday for an advance of a  $\frac{1}{2}$ d. per hour.

DUBLIN.—A strike of bricklayers, carpenters, plasterers, and builders' labourers, to the number of 3,000, has begun in Dublin, and owing to the strike 2,000 men belonging to other trades not in dispute with masters have been rendered idle. Three months ago the men applied for an increase of wages, and a week ago the masters submitted for their adoption a new set of trade regulations, to which the men strongly objected. Many of the strikers have left Dublin for English towns.

HINCKLEY.—A dispute, which has been in existence for the last month, between the builders of Hinckley and the bricklayers' labourers, has been amicably settled by arbitration. The labourers had demanded  $\frac{1}{2}$ d. per hour increase, making  $\frac{5}{8}$ d. instead of  $\frac{1}{2}$ d. as previously. The arbitrators—Messrs. G. Bott, Walter Spencer, and E. Hyde, representing the labourers, and Messrs. J. Lord, G. Kinton, and M. Foxwell for the builders—agreed, with one dissentiment, that an advance of  $\frac{1}{2}$ d. per hour should be given, making  $\frac{5}{8}$ d. The arbitrators' decision has been accepted by both builders and labourers, and work has been resumed.

KETTERING, &c.—At Kettering, Nelson, and Barry the men connected with the building trade came out on strike on Friday for a halfpenny advance.

NEWCASTLE-ON-TYNE.—The operative bricklayers have now fully resumed work in the Newcastle district on the employers' terms, to abide by their discretion on the question of who shall do the work of cement-flooring, as between bricklayers and plasterers. On the other hand, the plasterers still maintain their adhesion to the arbitration award of 1893 on the cementing question, and have coupled with it an advance of  $\frac{1}{2}$ d. per hour.

NOTTINGHAM.—The strike in the building trade, which at one time seemed likely to produce disastrous consequences, has been settled. An agreement was come to on Thursday night under which the men returned to work. The building trade in Nottingham is now active, and there is a probability that it will remain so. Building is going on in many directions, and upon a large scale.

PORTSMOUTH.—The painters and carpenters at Portsmouth recently asked for a rise of  $\frac{1}{2}$ d. per hour from 6d. and 7d. respectively, the notice to expire on April 30. The masters declined to give the

required rise, and the men left work on Friday. About 500 men are directly involved, but the strike may spread. There is considerable activity in the building trade at present in the district.

THE POTTERIES.—Sir William Markby, K.C.I.E., a representative of the Board of Trade, forwarded on Friday to the representatives of the parties interested, his award as arbitrator in the matter of a dispute between the master builders of the potteries and the bricklayers and bricklayers' labourers, with respect to applications by the latter for an advance in wages and a reduction of the hours of labour. The award was as follows:—"With regard to the requisition of the bricklayers as contained in the notice, I hereby award that the rate of wages under Rule 2 of the working rules shall, from the 1st May, 1896, be 8 $\frac{1}{4}$ d. per hour; and I further award that no alteration shall be made in the hours of employment under Rule 1. I consider that if any alteration is made in the hours of employment some attempt should be made to obtain uniformity in the different branches of the building trade. With regard to the labourers, I hereby award that the rate of wages under Rule 2 of the working rules shall from the 1st May, 1896, be 6d. per hour for scaffolders, and 5 $\frac{1}{2}$ d. for navvies, bricklayers' labourers, and general labourers. And I further award that no alteration shall be made in the hours of labour under Rule 1." These awards mean an advance of a farthing per hour to bricklayers, a halfpenny per hour to labourers, and a penny per hour to scaffolders.

#### CHIPS.

The case of "Powell v. Wedderburn" came before the Court of Appeal on Tuesday week, as an appeal by the plaintiff from an order made by Mr. Justice Romer in December last, in respect of certain hoardings in Kenyon's-court, Briggate, Leeds. Their Lordships allowed the appeal, and granted an injunction, with costs.

New municipal buildings at Blyth, Northumberland, erected at a cost of £12,000, will be opened on Thursday next, the 14th inst.

The new district church of St. Christopher, Ellistown, near Leicester, was consecrated by the Bishop of Peterborough last week. It is built of red Ellistown brickwork, with stone dressings, and consists of church nave and west porch. The style is described by the local journals as Victorian. Accommodation is provided for 270 persons at a cost of £1,800. Messrs. Goddard and Paget, of Leicester, are the architects, and Messrs. Scarr, Jowett, and Co. the builders.

The important collection of modern pictures which belonged to Colonel John Hargreaves, deceased, late of Maiden Erlegh, Berks, came under the hammer at Messrs. Christie, Manson, and Woods, on Saturday. The 126 lots brought a total of £13,100, prices showing in the main a considerable falling off on recent amounts realised. The landscapes by the late Vicat Cole, R.A., are, however, rising in value, his "Streathley" fetching 550 guineas, and his "Margrave" 500 guineas.

The unveiling of two memorial stones in the west front of the new Mission Baptist church in Desborough-road, Eastleigh, took place on Wednesday week. The chapel, which will be completed in about a month, will afford seating accommodation for about 250. It has been built by Mr. H. S. Rowland, of Southampton, from the designs of Messrs. Lawson and Donkin, of Bournemouth. The chapel has red brick facings and buttresses outside, and white bricks and red dado inside. It has an open roof, and the whole of the woodwork will be stained and varnished. The baptistry will be lined with white glazed bricks, and over it will be erected a platform and rostrum.

The London County Council adopted on Tuesday, after a discussion, the recommendation of the Improvement Committee to accept proposals of the owners of the Hotel Cecil, to give up sufficient space, in the event of their Bill in Parliament passing, to widen the Strand to 80ft. along the whole frontage of the hotel from No. 76 to 88, Strand, inclusive. The length proposed to be widened is 225ft., and the company ask £30,000 from the Council for the land, but reserve the right of building along the whole frontage of the widened road. The Bill came before a Select Committee of the House of Commons on Wednesday, and after hearing evidence in support of the proposals, given by Mr. Vigers, Mr. Douglas Young, and Mr. Walter Emden, the Committee declare the preamble proved.

At Knockholt, Kent, a new county police station has just been built from plans by Mr. F. W. Ruck, of Maidstone, the county surveyor. Mr. R. Avard was the contractor, and the outlay was £2,300.

We regret to hear that, owing to continued ill health, Mr. Henry S. Marks, the quaint limner of so many studies of wading and scansorial birds and elderly connoisseurs, has been compelled to enter the ranks of the Retired Royal Academicians. He was born September 13, 1829, elected an A.R.A., in 1871, and an R.A. in December, 1878.



## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2158.

FRIDAY, MAY 15, 1896.

## CUSTOM V. COMMON SENSE.

AGAINST our modern architecture it may be truly said that we have been too much ruled by ideas, and what Talleyrand has affirmed of "language"—that it "was given us to conceal our thoughts"—may be equally said of styles, or of those diverse modes of artistic expression which are now used so lavishly, even to the extent of suppressing that which is most reasonable and direct in designing. Half of our modern buildings seem to be designed on the principle of asserting a character which does not belong to them. We are constantly seeing new buildings which appear to suppress their real purpose; in fact, we see in them a *suppressio veri*, if not at the same time a *suggestio falsi*; not only is the real use hidden or suppressed, but there is a suggestion of something that is false—foreign to the purpose of the building.

It is very hard to say how far the dictates of common sense are to constrain the architect's work; to say, for instance, when an ornamental feature like a tower, or a turret, or a cupola may be introduced in a design without the sacrifice of appropriateness. As a matter of fact, the architect, to use a common phrase, is apt to "tumble to" an arrangement. He knows not why, but it comes to him naturally as the first idea that strikes him. Like the heredity of habits and physical peculiarities, there is also the heredity of ideas—certain arrangements and conventions which come up to the mind unasked, and which, unconsciously almost, get introduced on paper. Every architect of any individuality has a certain repertoire of ideas of his own, and he is rather prone to repeat them somewhat thoughtlessly in his work. On no other ground can we explain the employment of features by men whose designs are in other respects far above the average. In no other way can we explain how it is we get a certain type of tower or turret in Mr. A.'s designs, or a particular kind of gable or window treatment in the eminent Mr. C.'s work, no matter for what purpose. We can swear by a bit of Mr. Norman Shaw's, or Mr. Colcutt's, or Mr. Mountford's work whenever we happen to see it, and we can assert with some degree of accuracy that every distinguished architect has his own style or "hall mark."

When architecture began to be learned as archaeological science—as a matter of styles and features, instead of as on the old-world plan of learning methods and principles—it came about naturally enough that the man with a stock of ideas could not help showing them or using them in his designs on every occasion. Individuality rose when men began to practise architecture as a profession, when they began to drift away from the universal brotherhood of crafts, when buildings were erected by fraternities or guilds united by common principles of discipline and order. Then architecture was what it pretends to be—the organic expression of good building and workmanship, and there was very little room for the introduction of individual crotchets. How very different is it now! Every man practises art in his own way, without much regard to structural considerations. We have inventors, men who originate, and copyists; the latter are by far the larger class, and this imitation has intensified the departure from the old system. With them it is a matter of selecting and copying features which were devised hundreds of years ago. Take as one instance

the buttress and its pinnacle. It was invented for a distinct purpose, as a counterfort to take the thrust of a vault, and its ornamental termination was added to verticalise the thrust, and to bring it within the body of the buttress. But we all know how the modern imitator has used the form for a very different object—to make an ornamental appendage. He uses it very often when there is absolutely nothing to resist—no vault, and when his roof is tied. Again, the many-shafted pillar was designed to meet the requirements of a vaulted church when there were many members to carry. We see it now in buildings of the simplest description, where it appears meaningless. And it is the same with the painted traceried window which, originally intended to meet the requirements of a large gable end, is now seen used in every conceivable position under aisle roofs and in clerestories. It is attractive, and is copied without any reference to its position or use. So it is with numberless features which appear in designs for all sorts of buildings—cupolas, turrets, campanile-like towers, which are thrust into a design not because they are really wanted, but to make up a design. No one can object to a dome when it covers a space in the plan which can only be properly roofed in such a way—as, for instance, a central hall or staircase in a building having important lateral corridors, or a building in the form of a Greek cross; but we do certainly object to its being thrust into a design as simply an external feature where the roofing can be better constructed without its aid. Other things are just as complacently accepted without any inquiry. The columns in the vestibule are put there for effect, and because the author has seen them in other buildings; but there is not one atom of reason why they should be forced into the position, when there is nothing in the plan that suggests their use—no walls overhead to support. No one has ever found out the reason why one building should be crowded with windows, and another in the same street very sparsely furnished with those useful apertures. Common sense would answer that the ample fenestration is used because the building has a number of small rooms, each requiring light, or the one with few windows requires less light; but this answer will not do when we know that both buildings are for similar purposes, and have the same number of rooms. No; reason has nothing to do with it. The architect has simply copied some other building, or allowed his fancy to run away with his reason. Of course, we expect to see a large city shop or office block well lighted by large windows; other buildings, like banks or court-houses, with fewer windows. In a museum or picture gallery, where top-lighting is essential, we can dispense with a number of windows. Then we do not expect to find all windows of the same size or frequency. The residential or office building may have a number of small openings; but certain public buildings few and large windows. Men who have studied French, English, and American architecture tell us that those towns are most interesting where the buildings are similar in character, whatever the style may be. Thus, in New York, where the buildings all vary in style and height, there is little architectural character. There is no tradition or governing idea. Every architect adopts a particular style or some peculiarity of his own, and we see a collection of edifices of the most heterogeneous kind—a number of experiments in design, costly and without expression. It is a great and common mistake to imagine that a choice of different styles is an advantage. We may get variety of a sort, but it is incoherent and distracting as a whole. Better by far to follow a traditional and recognised mode of building, in which diversity may be got by attention to the real and practical problems of each

building. By looking after the requirements of plan and the most straightforward way of building, whether it be in brick or in stone, we have ample means for giving variety. Then we have modern materials—iron, for instance—clamouring for recognition, which we can make an evidence of the living character of our work, not by hiding it always, but by boldly exposing it under arches, ceilings, and in supports. But the modern architect takes all these things and transforms them into a particular style. He suppresses all that is distinctive in each material, till we get an insufferable sameness. It has been pointed out again and again that the variety of purposes for which buildings are erected ought to be emphasised instead of smothered over. The new technical school should be made different to a free library or a model lodging-house. The club-house should not be mistaken for an hotel, or a block of offices for a private residence. Yet we find that people easily mistake one for the other. They are, perhaps, built in the same style, and that is quite enough to make them look like one another, or the same features are introduced in both. A glance at the designs in the Architectural Room at the Royal Academy is sufficient to show how certain conventions still hold a place. We have happily a few departures from commonplace; close adherence to style is happily a thing of the past, but we still see a longing to run into certain grooves. Here we see an elaborated design of Elizabethan character, there an affectation of simplicity and breadth, almost amounting to caricature; in one an artistic treatment of the Georgian period, in another an attempt to be quaint. The admirers of half-timber work are inclined to push this treatment too much, to make it rather ridiculous, and the same mistake is met with in others who carry gables and bays to an excess. From the crowded and riotous design, full of strange deceits, we have passed to almost the opposite extreme of abject bareness. With the most "admired disorder," even those who like "picturesque" jumbles have become satiated, and the new school has arisen in which breadth, and the suggestion of plain building, unsophisticated by architectural features, are the leading characteristics. We have, for example, in one case a country residence designed in what may be called a vernacular Georgian manner—a plain brick house with gables, plenty of high parapets and bare chimney-stacks; the windows are perfectly plain, small-paned sash windows under gauged arches; there are no cornices or pilasters or any of the "properties" of style—a quiet picturesqueness and broadness of wall-surface being the result. A very common-sense, inexpensive brick house—a veritable oasis after the "genteel" obtrusive villadom of the new building estate. Of course there is the danger even here of affectation of the old manor-house style, but if the designer is only true to himself and his building, this departure from the mere pretensions and restraints of style is in the right direction, and at least shows that, without assuming the architectural, we may yet design in the true architectural spirit.

## PICTURES AT THE ROYAL ACADEMY.

[THIRD NOTICE.]

UNNECESSARILY large canvases, portraits of nobodies, and a pandering to weak sentiment are ever-recurring mistakes on the walls of the Academy, and till these faults are removed we cannot be surprised to find real merit unrewarded, or mediocrities in art usurping the rightful place of honour. So long as the Academy walls are a passport to commission or sale this state of things will continue, and pictures will be painted for those qualities which command popular success, and admit of easy reproduction. Battle-



pieces, *genre* of a commonplace kind are generally sure of a class of picture buyers. It is disappointing, however, to hear that the works of strong men, whose pictures appeal to another and higher motive of art, have been excluded because of their advanced views on painting, which at present do not find favour with the older school of Academicians, who seek to cold-shoulder original talent.

We have seen many versions of the poetical legend which George S. Watson paints, "La Belle Dame sans Merci" (568). The painter has caught something of the romantic sentiment; the lady on her steed, her hair adorned by flowers, in a scarlet mantle, is wending her way, her lover walking at her side, through a field of marguerites and foxgloves. Only the horse's head and the armour-clad body of the youthful gallant are visible above the wild undergrowth of flowering grass. It is to the scheme of colour that we may dissent—strong, undoubtedly, the warm glowing light of the setting sun irradiating the faces of the pair. A certain degree of romantic interest is given by the dark forest behind. Another strong piece of colour is "Whither?" by Byam Shaw (574), a clever allegory. Through a dark, deep, sapphire-coloured sea of swelling and turbulent billows a light craft or galley is being wafted by nymph-like figures. In it, at the helm, recline a man and woman wrapt in embrace; at the prow, a Hope. Large bubbles, in which are to be seen future events, are being lashed up by the seething waves. A mystical dream-like conception has been handled with undoubted power, and this is intensified by the warm colour and light which the painter has introduced.

Thorne Waite's landscape, "The Winds that Blow on the South Downs" (428), is delightful in its colour handling. The old Sussex church tower, with its massive proportion ensconced amidst trees, and the distant view of downs, the bending trees which feel the blast of the southerly gale, are very tenderly painted. "A Silvery Morn," by B. W. Leader (617), has little in common with his other landscapes. The colour and atmosphere are well declared in the title. The pale, pearly light of early spring is in marked contrast to the splendours of evening effects. Land sloping down to a stream, tenanted by silver birch, and covered with ferns, whose feathery foliage reflects the light, is most delicately handled. The white, pearly sky and misty atmosphere are very charming. This picture is a companion to that already described, in which the golden sunset of autumn suffuses the trees on the skirt of a forest, and its glowing splendour is reflected in a stream; but its proximity to Mr. Abbey's great dramatic Shakespearian picture, "Richard, Duke of Gloucester," noticed last week, in which strong scarlet and black are the chief colours, is detrimental to Mr. Leader's work.

John Brett, in the same gallery, has one of his brilliant seascapes, in which the beauty of light and colour, of limpid waves; the sparkling crests and rocks are to be seen at their best. His "North Devon Cliffs" is a wonderful piece of realism. The shelving waves which bathe the shore, the glistening rocks, and the effect of sunshine on the distant sea, and rainbow are painted with technical skill; we can even discern the rain-cloud which has burst over a portion of the coast. Whatever of mannerism there is is atoned for by the subtlety of hue and luminous air, fresh and sparkling sea.

"The Coming of Apollo," by Robert Fowler, is a large, poetically-conceived subject, in which the light of dawn is heralded by wood-nymphs. The god of shepherds, lyre in hand, is seen in the background of the forest glade. In a low key of colour, it is only on the plea of its decorative treatment that we can excuse its size. Not

for any particular merit as a portrait, but for the realistic modelling of drapery, must we draw attention to a study of a young girl (596) in orange satin, whose little robe stands out aggressively like a relief—a work by Edgar Anderson. Exceptional in colour is Arnold Priestman's "Fir Trees" (593), and a large green landscape by Yeend King, "Hay in September," which is unpleasantly cold in colour.

"The Disciples of Sappho" (599), by T. R. Spence, is ambitious. The array of musicians on a terrace by a blue sea lacks concentration and repose, and its interest mainly rests in its colour. Arthur P. Burton's large subject, "The Nymph of the Bay" (534) is astonishingly bald and uninviting—except as a realistic satire on a modern school of painting.

Frank Bramley, of the Newlyn school, has only one subject, "While there is Life, there is Hope" (645), a vigorous piece of realism, in Gallery VIII. A humble farm cottage interior, dimly illumined by firelight. Women are anxiously looking at a lamb which lies motionless on a straw bed before the fire. A dog at the side of his young mistress stands near, and are both intently watching the little sufferer. Mr. Bramley's incident is sympathetically treated. The light which glimmers through the small casement outlines the darkened figures, and mingles strangely with the firelight glow. Ellis Roberts has a graceful full-length portrait of "The Countess of Mar and Kellie" (647) in white. Henrietta Rae has given us one of those graceful studies of the nude which disarms any sense of impropriety. "Summer" is a blithe, comely figure of a young girl lying on a bed of pink roses and petals, the colour of which is made to harmonise with the flesh tints. The foreshortening of the limbs and the modelling are faultless, and the harmony of pink is intensified by the deep blue water in the background. The large picture by the Hon. John Collier, in a luminous key of colour, "Pope Urban VI." (670), who is represented pacing the garden, filled with white lilies, reading his Breviary, beneath the window of a torture-chamber, which is lurid with firelight, is at least sensational in its size. The kindly and benevolent face of His Holiness, who is reciting the Office, hardly conveys the impression intended. The light scheme of colour and deep scarlet of the Pope's cap and cape has a brilliant out-of-door effect, in which the painter has displayed his accustomed refinement and technique; but the subject has questionable value and interest. The historian of the Inquisition has not always been unbiassed. No. 671, "Drawing Lots for the Guelph Succession," by Eyre Crowe, is hard and coarse in colour. We may refer also to Norman Garstin's "The Scarlet Letter" (682), full of poetic charm and subdued colour; Alfred East's rather too green landscape, "The Valley of the Chess"; David Murray's flat and uninteresting landscape, "Silvery Summer on the Banks of the Kennet." A very large picture of a football match, entitled "The Battle of the Roses: Yorkshire v. Lancashire," by W. B. Wollen, is full of atmosphere, and the painter has very skillfully seized a moment of exciting interest in the game, and has endowed his men with life and action.

We must pass rapidly through Gallery IX. In the centre of one side Laura Alma-Tadema gives one of her symphonies of colour in a small picture, "A Carol," a lady and gentleman in Flemish costume, the latter seated at a spinet; a delightful piece of colour. The blue-tiled dado and subtle tones of grey and blue and reflected light make a delicate harmony. "Market Day, Boston," is a feeling rendering of the old Lincolnshire market town in its grey, wet aspect. "Her Daughter's Legacy," by J. Henry Henshall (758), is strong and pathetic, and passing on we come to one of E. Blair Leighton's charming little *genre* pictures, "Con Amore" (787),

a girl on a garden seat, playing a favourite piece on a lyre; the Empire dress and delicate tones and the finish are admirably painted. John A. Lomax's "Preparation," too, is a very clever piece of *genre*—an old gentleman in red dressing-gown cleaning his spectacles preparatory to reading, Lillie S. Haycraft's humorous little subject, "The Railway Accident"—children playing toy trains on a terrace by the sea—has strong colour, and we must just note George Clausen's "Hoeing Wheat" (828) and "The Hay Barn"; "As the Twig is Bent," by J. C. Dollman; Lilian Edmond's portrait of herself (710)—a clever study of characterisation, admirable in colour, by a lady artist whose Continental style is obvious, and whose work in portraiture is promising. Anna Nordgren's "Birch Wood" (826) is also a pleasant study, the same lady sending two other examples of her talents.

In Gallery X. we have a clever work by Siegfried M. Wiens, "The Old Still" (878), the composition and handling in marked contrast to the large and commonplace canvases of the "Plains of Ghizeh," by Frederick Goodall, and Kate Morgan's "Slave Market." By far the best picture in this room is E. Blair Leighton's "In Nomine Christi" (896). The scene represented is the courtyard of a convent, with its chapel and lighted altar, at the door of which a number of white-robed nuns are rescuing from the further violence of a mob an old Jew who has fallen exhausted on the steps of the entrance. He has sought refuge from a band who have attempted to rob him. To arrest their steps and threatening attitude the abbess has approached the robbers. She holds up a silver crucifix, which has the effect of quelling them. The painter has very dramatically expressed the terror on the faces of the sisters. The costume of the nuns, the marauders who still stand at the entrance to the court and threaten the old man, whose wallet and gold have fallen from him, together with the precincts of the chapel, are painted in Mr. Leighton's finished and best manner, and the harmony of the grey and white tones is perfect.

W. Dendy Sadler's "Married" (901) depicts a young married couple who have had a quarrel. They are seated in a well-appointed garden, playthings lying on the grass. Their dispositions are not very congenial. The young man is reading a book at one end of the seat, and the youthful bride sits prim and demure near the other end. The colouring and accessories are wanting in tone and gradation. His other principal subject is in the VIth Gallery, and shows an elderly couple in a comfortably furnished room of the 18th century period. The old gentleman has nearly reached the end of the wool on his hands. The aged pair appear contented in each other's society; it presents rather a contrast to the other picture, both in its subject and manner of finish. A large picture, hung too high, is "The Vine," by Chas. H. Sims. The subject is apparently a Bacchanalian revel, in which the painter appears to moralise on the effects of this fruit; but it has a great deal of power in the grouping and arrangement of the numerous figures, and the colour is strong and harmonious. Almost like the work of the Glasgow school is Gerald Moir's canvas, "The King's Daughter," suggested by a poem by Swinburne, quaint and Mediaeval, and poetically conceived in flat low tones of colour, the face of the King's daughter sad and beautiful. Walter Langley has a large and touching picture, "Breadwinners" (932). The scene depicts the Newlyn foreshore, the pier, harbour, and lighthouse in the distance. On the beach three fisherwomen carry their "cawls" of fish. The typical grey atmosphere and the tranquil surroundings are fresh and luminous. "Volunteers for a Boat's Crew" (917) is a strongly painted seascape. A dismasted and disabled vessel is sinking fast in a dark billowy sea, while a crew is manning a boat



in a vessel near. Poetic and pleasing in colour is Richard W. Maddox's simple study, "A Flower Girl" (909).

A few pictures call for brief notice in Gallery XI. "In Early Spring," A. Delug paints to a large scale a sloping hill next the sea, with a woman hanging out clothes, commonplace enough in subject, but depicted with intensity of feeling and sincerity in low tones of greys. The large picture of George Harcourt, "The Leper's Wife" (956), is spoilt by the strong scarlet in the robe of the woman, which overpowers a touching composition. Herbert J. Draper's "The Vintage Morn" (994)—a pastoral scene suffused by warm tones of rich red colour, suggesting the Southern vineyard and the bacchanalian revel of maidens or goddesses, wearing wreaths of the grape, who with drowsy eyes dance in the warm red glade—a powerful picture in composition and colour. Near it J. R. Reid has one of his ablest landscapes, "Tinkers: Homeless, Ragged, and Tanned," strong in colour, and we must pay a tribute to A. Chevallier Taylor's "Vanities," in which a bevy of young girls are engaged in preparing their toilets, painted in cool grey tones. Frank Walton's noble woodland, bathed in glowing sunset hue, "The Farewell of the Glorious Sun" (1000), and Ellen A. Gayler's delicate colour harmony "Rosebuds" (1014), two little maidens in gowns of light green and yellow, with flowers in their hands, are worth notice; and the large picture of "London Flower Girls," by Bernard E. Ward, a group of flower-sellers and clambering urchins round the fountain in Piccadilly-circus.

#### ARCHITECTURAL ASSOCIATION.

THE closing meeting of the Architectural Association was held on Friday evening, the President, Mr. W. D. Caröe, F.S.A., in the chair. Messrs. C. E. New and A. J. Quartermain were elected as Members. Mr. B. F. Fletcher, senior Hon. Sec., called attention to the members' soirée, to be held this (Friday) evening at St. Martin's Town Hall, Charing Cross-road, and to the annual dinner, to take place on Friday, May 29, at the Holborn Restaurant.

#### A. A. TRAVELLING STUDENTSHIP.

The Prizes Sub-Committee reported, by Mr. Philip J. Marvin, the hon. secretary of the Prizes Sub-Committee, on the drawings sent in for the A.A. Travelling Studentship. These consisted of three sets, the authors being Messrs. de Gruchy, Waring, and Hide. The sub-committee were unanimous in placing the drawings of Mr. C. de Gruchy first, and they advised his appointment as the A.A. Travelling Student for this year. Mr. de Gruchy's drawings of the Ramygge Chantry, at St. Alban's, were done in the most careful and conscientious way, and were worthy of great praise, the rough drawings made on the spot being well carried out in the finished set. The sub-committee did not award the second prize of £5 to Mr. Waring, for though his drawings were not without merit, the measured ones represented casts from monuments at the South Kensington Museum, and it was not quite the idea of the founders of the A.A. Travelling Studentship to encourage this sort of work, excellent in its way, but rather the study of existing buildings with their construction.

#### ELECTION OF OFFICERS AND COMMITTEE.

The President read the report of the scrutineers, who reported that 234 voting papers were sent in, of which only one was rejected as spoiled. The result was: President, †A. Beresford Pite; vice-presidents, †W. Howard Seth-Smith and †John Begg. Ordinary members of committee: †W. D. Caröe, 209 votes; \*E. W. Mountford, 207; †G. H. Fellowes-Prynn, 190; \*F. G. F. Hooper, 186; †F. T. W. Goldsmith, 184; \*Owen Fleming, 178; †A. H. Hart, 173; †J. W. Stonhold, 118; \*A. W. Earle, 117; and R. S. Balfour, 116. Hon. treasurer, \*Hamden W. Pratt; hon. librarian, †C. H. Freeman; hon. secretaries, \*B. Flight Fletcher and †E. Howley Sim. The above form the committee. Other officers: Hon. solicitor, \*W. H. Jamieson; hon. assistant librarian, \*E. W. M. Wonnacott; hon. auditors, \*F. G. W.

Buss and M. Garbutt; assistant secretary and registrar, \*D. G. Driver. (An asterisk \* denotes re-election, and a dagger † change of office).

Mr. FRANCIS G. F. HOOPER, past-president, proposed in cordial terms a vote of thanks to the retiring president, Mr. Caröe, and the retiring vice-presidents, Messrs. G. F. Fellowes Prynn and F. T. W. Goldsmith. He observed that Mr. Caröe's enthusiasm had been very evident from the first time he joined the committee, and was most consistently maintained to the end. The success of the session had been equal to any previous one, and all felt that the prestige of the presidency had not suffered by Mr. Caröe's occupancy of the chair. They had expected great things of him and had not been disappointed. Mr. S. BEALE seconded the motion, which was carried by acclamation and acknowledged from the chair. Mr. FELLOWES PRYNN proposed a vote of thanks to the hon. secretaries, eulogising their diligence and business-like tact, and regret was expressed that Mr. A. H. Hart was retiring from the office of junior secretary. The services of Mr. Stonhold, late hon. librarian, Mr. Hamden W. Pratt, hon. treasurer, and Messrs. E. Woodthorpe, Theo Moore, and the Hon. J. McGarrell-Hogg, retiring members of committee, were also heartily acknowledged, on the motion of the President and Mr. O. FLEMING.

#### FABRICS.

Mr. ALDAM HEATON read the following paper on this subject, illustrating his remarks with numerous examples of hangings and reproductions of greatly-magnified photographs of hair, wool, cotton, and linen fibres to uniform scale:—Some years ago, I read a paper\* before the Royal Institute of British Architects upon "Hangings," in which I gave a most elementary description of a variety of useful fabrics and the yarns from which they were made, and I was amused to see that one of the daily papers said, "it would be well if Peter Robinson's young men could read Mr. Heaton's paper." I suppose the remark was intended to be complimentary to me, at least, but it showed that others had noticed what I had long been aware of, that the shop-keeper's assistant is known to be profoundly ignorant of the nature and constituents of ordinary fabrics. If you go into a Yorkshire mill and produce specimens of fabrics which are interesting or uncommon, there are two or three simple tests at once resorted to to explain their nature. The first is commonly the tongue; wool and cotton reveal their nature much more plainly when wet than when dry. The next is fire; upon application of a lighted match you at once distinguish between animal substances and vegetable. The former burns to a cinder, the latter to an ash, like paper. The fingers, also, of a person experienced in fabrics, reveal very much. The nose tells a little more. Linen, for instance, rarely loses its distinctive smell, even after many years of exposure. In a London shop none of these tests are resorted to, and your ordinary shop-keeper's assistant is generally entirely in the dark as to the nature of the fabric he is selling. And, as it is the study of a great many manufacturers to hide the cheap materials of a fabric behind the costlier ones, in fact, pretending that the cheap materials do not exist, no wonder that the amateur is completely deceived. It will, therefore, be my aim to point out carefully the nature of the most useful fibres, and by that means to arrive at the characteristics of the fabrics produced from them. There is no use talking of "good fabrics" and "bad fabrics"; but only of their suitability to the uses we make of them. Perhaps there is no more rubbishy-looking fabric produced than what is called "scrim," but the man who has to line a rough wall knows perfectly well that scrim is a really good article when so used. In the same way, the poor miserable fabric called "butter-cloth" is admirably suited to the wrapping up of butter, and is as good for the purpose as paper is bad. The mischief steps in when people attempt to make curtains of scrim, or dresses of butter-cloth. A few years ago some of the ladies who commenced the School of Needlework in Kensington, set the fashion of using Bolton sheeting for dresses—and even embroidered dresses. No doubt there is a proper use for Bolton sheeting, though I have never been able to find it out myself—unless it be to make sheets for paupers; but a viler misuse of a fabric than to put it to carry embroidery for dresses was surely never thought of. Of

course, it would be impossible for me, under present limits, to go through all known fabrics, and to inquire into all their uses; I can only attempt to examine the more common and the more useful, especially in regard to the substances from which they are made. The terrible fashion which has set in of late years, to have everything at an almost impossible price, has further muddled us in a question of which most of us were sufficiently ignorant. For now it has become necessary for the manufacturer who has looms to keep going to make linen appear like silk, cotton like wool, jute like linen; to hide threads, which form the substance of the fabric, behind others and costlier ones which form its surface; and so, if possible, to deceive even the very elect. I suppose cotton to be the fibre which mankind first made use of for woven fabrics. The history of the early stages is buried in obscurity, and certainly it is quite antecedent to any known literature. I have seen a specimen of cotton fabric, produced at least four thousand years before the Christian era—a piece of mummy cloth—and though a great many ancient manufactures are made of linen, I think, considering that parts of India, and Egypt, were settled, and, so to speak, civilised countries long before these Western lands, there can be no doubt that cotton fabrics are the earliest productions. But whichever it be, cotton or linen, is little to our present purpose. Both of them are very long in the fibre compared with wool, and entirely without spring and elasticity. Crush, or pinch, or bend either of them, and they assume and retain the bent and crushed form so obtained—in contrast to the behaviour of an animal fibre, which springs back into its original form. (Mr. Heaton referred to a variety of photographs of various fibres greatly enlarged, for comparison as to the bulk of horse-hair, wool, cotton, silk, and showing especially how the cotton fibre was devoid of spring and elasticity.) Now this is an exceedingly important element in these vegetable fibres; if the use to which you apply them demands that they should hang in good folds, and have natural spring in them to retain these folds when crushed or crumpled, clearly they are inadequate. They are, for the most part, cheap fibres, and their length of "staple" (as it is termed, alluding to the natural length of the growth), adds greatly to the strength of the yarn produced from them, and in this respect they have always an advantage over short-staple fibres. The fibre of cotton, in its manner of growth, is quite straight, has none of the wriggle or wave of wool, and in spinning is kept straight. Its chief utility for better and more valuable fabrics is that of forming a cheap and useful warp (the lengthway threads of a fabric), and as it may be made into an exceedingly strong thread, owing to its evenness and length of staple, it must always form a most useful and desirable fibre for that purpose. Unfortunately its cheapness tempt the competing manufacturer to use it for weft also (the cross-way threads), and so used, its inferiority to animal fibres becomes apparent, for it is entirely free from lustre, and absolutely flaccid and without spring. Consequently, however useful it may be in its place, it is certain greatly to depreciate those fabrics where lustre and spring are essential. You will see from these remarks that cotton, apart from the question of warmth, must always be amongst the inferior and less valuable of fibres. And when one considers how largely the question of warmth for dress and hangings, in these Northern countries, affects our view of the value of a woven fabric, you will see at once its undesirability in the majority of our better fabrics, and when competition comes in to make it used when it ought not to be used, its cheapness is a snare of the greatest magnitude. I cannot forget here the question of utility. Short-sighted people will go about saying, when warned that a fabric will not wear, "Oh, it will last long enough for me." But there inevitably comes a day of retribution; and it is not to the credit of any of us, still less to the credit of decent housewifery, that we should encourage the use of a fabric which will not wear a reasonable time. There is sure to be a day of recrimination and repentance when one has allowed a bad article to be used. People are well aware of this when they come to the constructional questions of a building. You do not build with a brick or a slate which is only to last two or three years—or even with a plaster which will crumble in the same time. The weakness is too evident, and the consequent regret and ill repute too immediate; but people will constantly use woven fabrics

\* See report in our issue of April 27, 1891, p. 562, Vol. LXIV.



which their own sense should tell them, let alone the warning of a conscientious salesman, will be shabby in a twelvemonth. And any dyer, and any shopkeeper even, will tell you quite plainly that a fibre of cotton will not take dye at all well. There are one or two exceptions to this rule, as in the case of Turkey red and indigo, and possibly the dyes obtainable from cachou. But for all that, the rule holds good that cotton receives dye badly; therefore any salesman should advise people that a fabric which has its main surface of cotton should be used only sparingly when dyed. In printed work this remark does not quite apply, because the mordants used in printing are so much more reliable and serviceable than any mordant used in dyeing. Its true serviceableness is in its natural white, or creamy-white state. Even two or three years ago a French traveller who came over selling fabrics in this country used to say as a recommendation, "It is all wool," or "all wool and silk." Lately this remark has been entirely dropped, because the fabrics he now brings are half, or nine-tenths, or entirely cotton. Ask him about the permanence of these, and he has not a word to say. He shrugs his shoulders, and says, "Monsieur, it is what is wanted." And these remarks apply to all the vegetable fibres. Linen is a fibre of a still longer staple than cotton; but it is relatively clumsy, and never loses, however much it is handled, a certain stiffness. Now this quality makes it valuable for sheets and towels and the napery of the table; but in price it cannot compete with cotton, and its uses are much more limited. It is exceedingly strong and enduring, and it is only when manufacturers use it to supersede wool, wishing the unwary to mistake its stiffness for the spring and firmness of wool, that its undesirability is discovered. If people, in buying fabrics in shops, would take the simple precaution to light a lucifer match and test the nature of the fibre (animal or vegetable) where there is any doubt, they would hold manufacturers in check about this false use of linen. Perhaps in linen the undesirability of using things out of their proper sphere is most apparent. For warm or temperate climates its smooth and almost lustre-like surface, forming the very best of conductors, makes it feel, as we see in sheets and table-linen, agreeably cool to the touch. And here, I think, is its greatest value. But its stiffness and comparative coarseness will always render it one of the least used of our fibres. Silk must have been used in very early times, and being an article of Oriental production, it may have been used as early as cotton. As an animal production it at once attains a value, as also from its lustre, which can never be accorded to the vegetable fibres. But its principal characteristic is the smallness of the fibre, which can be best understood by telling you that about 75 miles of it only weighs one ounce. As a first process in the manipulation, the cocoon is thrown into hot water, and is then fingered and rolled round, and otherwise slightly rubbed, until the outside end frees itself from the rest, and the manipulators then pass it over a wheel or spindle, and in this way the original filament of the silkworm is obtained free. But, owing to its exceeding smallness, four of these threads are usually wound together, and the thread generally used by the embroiderer—*e.g.*, for high-class work—is at least twenty of the silkworm's threads. I mention this merely to give you some idea of the exceeding smallness. It is flaccid, and for the most part springless, except when used in considerable bulk; but, as you all know, it has a beautiful lustre, and may be called the prince of fibres from an ornamental point of view. And here I must break off to draw a broad distinction between silk called in trade "net" silk (the thread of the silkworm) and "spun" silk, which is composed of the spoilt cocoons, either where the worm has died inside or has eaten its way out; in which cases the cocoon could not be wound off. It is entirely a modern manufacture to utilise these dead or spoilt cocoons; and the result must never be confounded with the silkworm's filament. The manufacturing process is that the whole of these inferior or spoilt cocoons must be softened by boiling, and then pulled out anyhow into a factitious thread, including even the very body of the worm itself; so that if you come across a silk fabric which seems unusually heavy, at a moderate price, you may know at once that it is this inferior silk. Naturally, it is always irregular and full of lumps and rubbish; the silk fibres not going all one way, as they ought to go, but in a tangle and

mess. Its price may be considered, for our present purpose, not more than one-fourth of net silk. No doubt it has its uses, but they are comparatively few compared with the real article; and it should always be borne in mind that, from the nature of the yarns so made, it receives dirt rapidly. I need only point out the modern questionable use of it in the form of plush to illustrate my meaning. It is always a source of regret to me to find how far embroiderers consent to use it in the form of filoseille. Hence arises, I think, a great deal of the thoroughly inferior embroidery of the present day, as compared with old Italian or Spanish work, which was always made from the silkworm's filament. The manufacture of this filament is known in trade by the word "throwing"; the factitious thread I have been discussing is known as "spun"; and the thrower and spinner are, in manufacturing districts, engaged in entirely different trades. Thrown silk is occasionally required as fine as four of the silkworm's filaments. Spun silk is more the thickness of eighty to a hundred. If you can think of the superiority of an old Lyons velvet to a modern plush, you have the difference between the two well accentuated. It is difficult for the inhabitants of a cold or temperate climate to assume the feelings on these questions of an Oriental; but, speaking as a European, I confess I cannot but think of wool as far the most valuable fibre we have. I should think it came into use later than cotton; but I do not think there is any utility in endeavouring to ascertain how much later. There is a broad distinction to be made between wools; or, to use the trade phrase, between "worsted" and "woollen." It is only a distinction that has come of our manner of manipulating it; but still it is a very broad and necessary and useful distinction, and I want to explain it to you, because I see the utmost confusion here in the south of England about it. In the manufacturing parts of Yorkshire, the seat of the trade in both, every apprentice boy knows the meaning of that distinction. Fine wool, grown in the hotter climates of the world, has a natural wriggle or wave in it, so that the nigger song which speaks of "the wool on the top of his head" has more truth than one thinks. All the wools of the colder climate are straight and of the nature of our own hair. Goats' hair, the wools of Iceland and Russian sheep, the north of England wool, and many other sorts, are all straight, or, if they have a wave, have very little—certainly nothing which can be called a wriggle. Many of these fibres are at least 6in. in length, some longer, while the wool of the more southern countries, the Southdowns of England, Saxony, and especially Australia, are full of wriggle, and they are seldom more than one-third of the length of the hairy wools which we have been speaking of, and are often only 1in. in length. Now, when these northern wools come to be manipulated, they are kept straight during all the processes of spinning, and, somehow or other, have come to be called "worsted." It is said that this word is derived from the name of a little town in Norfolk, to which Flemish spinners and weavers emigrated and used these very wools; but I will not vouch for the accuracy of this explanation. (Mr. Heaton here exhibited photographs of wools and the yarns spun from them.) The short and fine wools have too much wriggle in them, and are too short in staple to be so treated, and they are spun without any attention to the position of the fibres, which wriggle up and felt together in the manipulation, and are popularly called "woollen." If you consider the difference between these two processes, you will find it to be immense. The "woollen" is used for most of our clothing and blankets, and things we require for warmth. The "worsted" is a much better conductor, and so is not adaptable for this purpose. As regards value, however, the worsted is considerably ahead of the other. Goat's hair fetches ordinarily 2s. per lb., partly, no doubt, from its beautiful gloss and spring, while I have seen wool sent into Liverpool for sale, of which the staple was so exceedingly short, although beautifully fine, that, having been knocked down at auction at 2d. per lb., the buyer found that it would not pay to expend the railway fare for removing it, and it was left in the docks for years. That, no doubt, is an extreme case, but it will serve to show you how these fibres sell according to the length of staple. Not that I wish to depreciate the value of woollen yarns for a moment. All men's clothing, and cloth generally, and flannel and blankets, and things necessary to our comfort, are woollen. On the other

hand, the fibre called alpaca, or llama, forms a fabric which is generally pronounced the most beautiful. The alpaca is the South American form of the camel, showing how animals, separated by one of our primeval changes of the earth, may develop in two different directions, the hair of the Oriental camel being vastly inferior. Next to this in beauty and utility comes, I think, the hair of the Syrian goat, which Mr. Holman Hunt has delineated in "The Scapegoat"; we usually speak of it under the name of "mohair." It is quite distinct from alpaca, though often confused by name in the shops. These hairs (they are called "hair" in the market) and the long wool of the North of England, Scotland, and to some extent Iceland and Russia, possess the valuable quality called "lustre" or gloss, a character much valued; but of course we do not see it in the short wools of which clothing is made. Now it will be evident here that these fibres which, on the average, may be called, when worked up into yarn at least, two shillings per pound, are readily adulterated with cotton, which may be called sixpence per pound, to the great deterioration of a large number of fabrics, and forming a very nice snare for the public generally. For wool, as I have shown you, contains springiness and gloss and warmth-bearing qualities, while cotton is entirely without these, and we ought all to learn to detect the presence of cotton in these fabrics. For you see at once the temptation to use it as an adulteration. To such an extent is this done, even with silk, that cotton is used, mingled with silk, to lower the price. And many a lady who thinks she buys a silk dress, gets one that is one-third cotton. The burning test at once reveals this. I advise you, when you buy your wife a silk dress, to light a lucifer match and see how it burns; whether like paper or like wool. It is worthy of observation here that silk, owing to its great value, has been adulterated in another way—namely, by the addition of sugar of lead, in the trade called "weighted"; but fortunately for the general public, the sugar of lead burns like paper, and where a great deal of it has been introduced the whole fabric burns like paper, giving one the impression that there is no silk in it whatever. I hardly know whether it is necessary to go into the question of jute, which is a fibre derived from a plant analogous to linen. It is, perhaps, best to think of it as a very coarse, strong linen, with all the strength, and even more length of staple than linen; and I only mention it because of the tendency to cheapen material, which has come to make it a sort of coarse substitute for the other vegetable fibres. It seems to me to have no beauty whatever; but it may be useful enough in the form of packing canvas, and employs many Dundee spinners and weavers. To turn to the woven material. I trust we shall never lose sight of the splendid fabric of tapestry—at all events, in these countries, Belgium, England, Spain, France, where we have learnt to know the beauty of it. It seems to me, beyond all others, to be a fabric which Mr. Ruskin would call "noble"; but I hesitate to say much about it because of its costliness. It is scarcely a practical question of the hour. It is more essential to consider the fabrics made in looms, which we all buy, and which are in daily use. Old tapestries had a warp of cotton or linen, well embedded in cross threads which were invariably worsted. Next after tapestry, I suppose, we must place velvet, not for its general utility, but for the beauty of the production. When one reflects on the beauty of the velvets of Genoa and Venice, often figured and containing threads of gold and silver, it is impossible not to be conscious of the beauty of the threads from which they are made; although here again the warp was usually cotton. To-day nobody seems to be willing to buy anything but cheap imitations of them. The velvet woven from mohair and partly wool on a cotton warp again, and known generally as Utrecht velvet, produced both in Germany and the North of France, and now by Lister, of Bradford, must not be forgotten, and though I can scarcely call it beautiful, it is undoubtedly a most useful and excellent fabric. So much is this article in request that the utmost ingenuity has been brought to bear on the production of it, and some clever fellow has found it possible to weave two pieces together, face to face, where the threads forming the velvet are automatically cut, and the one piece in the loom comes out two pieces in the hand. There is a shockingly bad edition of this article, which bears the suspicious name of "plushette,"



which may be best described as an admirably-designed dust-trap; and, by way of keeping up the modern fashion for adulteration, velvet has also been made from jute, of which the best I can say is that it is not as nasty as you would expect. And for those who like cheap and showy rubbish, I need not remind you of velveteen as a groundwork for printed curtains. Though showy and fine in texture, it seems to me to have resulted in a fabric which is at once entirely flaccid, a quick fader, and a quick catcher of dirt. It is the most prominent instance I know of of unconscientiousness in modern trade. Plain velveteen for dresses, which is probably only wanted for ephemeral use, is admissible, and probably a useful article. After these come damasks; and I suppose (velvet alone possibly excepted) silk damask is the most beautiful fabric made, especially when the warp and welt are both alike. The resource shown in the patterning of this fabric is beyond all praise for artistic ability; but the cost will always keep the production of them comparatively small. Now, if the surface of them be kept entirely of silk, there is no objection to a backing of worsted; and in the north of France large quantities are made of a fabric entirely silk on the face, and entirely worsted behind. I regret to say that the silk in this article is only spun silk; but there must be cheap fabrics produced for people with shallow purses, and this article (until some people in excessive zeal for low prices, did their best to spoil it by changing the worsted at the back to cotton, and not saving a sixth of the whole price) was really and is, for those who will demand the original article, a most excellent fabric. Buyers should insist upon the backing being of worsted. Modern competition comes in here again to spoil a good article. The silk damask which covered the wall of an Italian palace was entirely net or thrown silk. The silk damask made for to-day's trade is nearly all cotton—cotton in the warp and partly cotton in the welt. The lucifer-matches (and which of us does not carry lucifer-matches nowadays?) will detect the cotton at once. I am disposed to place next to these a variety of Yorkshire goods woven from long-haired, springy worsted, both for beauty and utility; utility both for dress, for curtains, for wall-coverings, for summer clothing, and numberless other necessities of life. We speak of them as worsted satins, camlets, moreens, diagonals, &c., all made from long wool, and occasionally goat's hair. If to hang in fine folds is a merit in such articles (and who can doubt it?) these fabrics unquestionably carry the day over everything else. No fabric made of yarn with the flaccidity of cotton or linen can be compared with them. The only thing remotely equal to them in this respect is woollen cloth; and you at once start without the lustre. I shall be unable, for want of time, to include questions of the loom; but I cannot, however, omit to mention another result of competition—the destroying of the usefulness of fabrics. Ordinary weaving is, of course, over one, under one; and all pattern weaving is a series of varieties from this, whether it be a simple twill, which is over two, under one, of the welt; or other small variations which are quite consistent with the production of a good fabric. When, however, we come to the Jacquard, the temptation is to take great liberties with this arrangement, and, roughly speaking, to go under one, over ten; and the result is a poor fabric. This should never be forgotten; because, once let a fabric become loose in the construction, and its life, in reasonable condition, becomes exceedingly shortened. You will find this particularly in figured fabric with a good deal of cotton in them and very little silk. They may be filled with gum or size to make them passably saleable while fresh from the loom; but hang such a cloth up as curtains, or make it into ladies' dresses, or hang it as wall draperies, and you have a fabric which begins to lose its integrity, and becomes shabby and worthless in an incredibly short time. As an instance of what I mean, I have laid on the table a thing recommended for wall draperies. I was charged with the hanging of a room with this very article—I regret to say by an architect. I pointed out to him the worthlessness of the fabric, but he said it caused him a great deal of trouble to get even that agreed upon, and at a price so proportionately cheap. I believe we ultimately both got into trouble about it. It is undoubtedly difficult for me to speak here, in the limited space at my command, about carpets. You know, as well as I, the beauty of an Oriental carpet—

not alone the costly carpets made probably at the order of a potentate whose palace was gilded, or the exquisite work done four centuries ago with silk pile (the best of which, I think, were made by refugees in Poland)—but the ordinary carpet common throughout Asia and down to the shores of the Bosphorus; distinguished, not alone for beauty of design, but also equally for beauty of colour and for technical skill in the manufacture. The clever and skilful way in which these carpets have their pile arranged slightly on the slant, which is preserved continuously throughout the life of the carpet, places them at once, irrespective of their beautiful colouring and design, ahead of our modern productions, for the modern pile carpet has the exceedingly bad fault of its pile becoming crushed in this direction or the other, and so producing ugly places, which look as if they had been damaged; the Oriental pile, on the other hand, always slopes, however much worn it may become, in the way in which the weaver gave it its original cast. Perhaps, in the nature of things, we shall have to content ourselves with picking up the old carpets now and again for the well-to-do, a restoration of this work being, I fear, impracticable. But the drop is terrible when you come to consider the modern carpet; for instance, that of Kidderminster, which does not, I think, merit any consideration at all. Our old friend, the Brussels carpet, may have been a good fabric twenty years ago, when its thick threads were made of good long-haired Yorkshire wool; but modern competition has reduced the thickness of the thread and the staple of the wool to such an extent that I am told that a Brussels carpet will not last one season in a London club. And the article is so well known, and buyers are so accustomed to it at a low price, that it is useless endeavouring to return to the old quality. To me it seems that the imitation Axminster carpet of Templeton and other makers is by far the best fabric in the market. It is made, as probably you know, of worsted chenille; the chenille being prepared beforehand, and all the colours being woven in their proper places by the Jacquard, or an equivalent machine. The chenille is woven on a cotton warp, and the backing threads, which form the body of the carpet, are either jute or coarse worsted. Now, the chenille makes a complete surface, and unless some fool gets at the backing threads with a pen-knife, the foot never touches anything but the pile, and nothing else is exposed to wear. So long as this condition of things holds, I do not see what is to wear them out. They may get dirty, of course; but destruction, in the ordinary sense of the phrase, as applied to the fabric, is all but impossible. But it has the very serious defect which I spoke of just now—that of the pile lying in varying directions instead of all one way; but no doubt some clever person will some day remedy this defect. The carpets known as Wilton have, in a measure, the same qualities, though not woven of chenille, the top of the pile alone being exposed to wear; but they show every seam plainly, and entirely want that sense of breadth and compactness of surface which we expect in a carpet. There remain, though I do not know why I should put them last, the multitude of very useful fabrics made of woollen welt, as distinguished from worsted, and more or less associated under the name of "cloth." Some of them, under the head of serge, are thoroughly good, hanging in good folds and wearing for years. The pity of it is that they have been selected to be cheapened by the introduction of a cotton warp, and little by little the deterioration of this fabric has gone on until the lower qualities are valueless. But on worsted warps they are thoroughly good. Of cloth proper there is an enormous variety. The article (in the processes to which it is subjected) becomes very much felted, and it is then a most impervious fabric. The felting may be done to a greater extent or a smaller one, as desired. For certain purposes—as, for instance, the overcoat of a driver who wants it to turn rain—it can scarcely be overdone; for draperies, curtains, grounds for embroideries, &c., it should be done comparatively slightly, so as still to exhibit its construction quite plainly. It gains, however, sufficient firmness by a very moderate amount of felting to fall into most excellent folds. I am not sure whether the French army cloth is not the best cloth I know. And this brings me to the question of what I may call "character" in woven fibres. A proportion of people, among whom I may prominently mention architects, like to see the threads of a

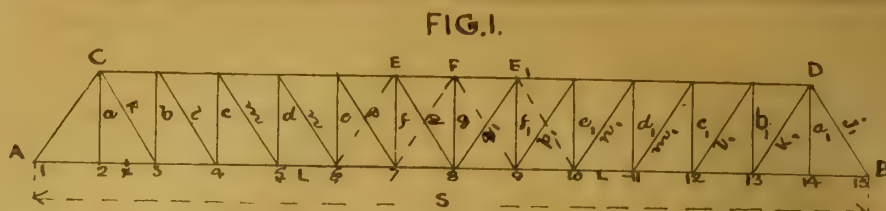
fabric. They feel, which is no doubt true, that there is an element of deception and humbug about a fabric whose threads are invisible, where the whole construction is hidden beneath an artificially raised nap (as in the cloth which we wear in the evening), or in a mere fuzzle like a felt, and they would like to see the construction of the thing. But the difficulty is that a still larger number of people (among whom the fair sex is prominent) like to see everything as fine as possible, and this also suits the book of the shopkeeper; for a fine-looking article at the money is like good wine, it "needs no bush." But these two demands are inconsistent with each other. If the demand for a visible construction only goes the length of excluding felts and fine satins of cotton or worsted, there would be no harm done; but we have always to bear in mind that cloth, which is an excellent article, has always been for centuries made with a raised or dressed surface, and still, in spite of it, remains a most excellent fabric. The Orientals have been most successful in the production of fabrics which, while showing the construction plainly enough, still look good and handsome. And no doubt if you could all set the example of demanding such fabrics, Leeds would soon provide you with home-made things with that character—a cloth which as they say in the market "shows its bones." In Italy the usual covering of a horse who brings a light cart to market is a cloth almost entirely without nap, generally of a pale scarlet; and as facilities for intercommunication improve, no doubt the Italians will bring it to our market. The French army cloth which I mentioned, and of which a large pattern is before you, seems to me a happy medium, the raising of a nap being exceedingly moderate. It is difficult to speak of the question of muslins; their uses are so various and their prices so moderate. But they have furnished us of late years with the Swiss leno curtain, which seems to me entirely abominable; and the figured muslin called Madras, of which, I take it, the principal characteristic is that it gathers dirt at an unprecedented pace. I think, if people want summer curtains of a thin material, they should be content with the muslin plain. I have not hitherto spoken about an important article of modern industry—chintz. And it is difficult to speak of it without so many qualifying adjectives as to amount to nothing. I do not know whether any of you are acquainted with the old Indian prints of a century ago, going more or less under the name of "Palampore"; but, though on thin white cotton ground (entirely cotton), they are so exceedingly beautiful (or were) that they must not be forgotten. The trade still continues at Cawnpore and elsewhere up to the present day, in a cheap and less desirable form, but still with much merit. They are now printed, at a low price, on rough native cotton, and, I think, gain by the use of that cotton, the whites being more ivory-like—something between the shade of dark ivory and salmon. To my mind, we have no English or French production to compare with them, and if the designs were better adapted to our modern wants, we should see this article in great demand; but the patterns are immensely large, and, as a matter of workmanship, very badly done. The old goods of this character, which I mentioned as produced a hundred years ago, were, however, far better in workmanship, and on an absolutely white ground, which, with its accompaniment of fineness and mechanical regularity, make us suspect they were sent out in the early days of John Company to be printed in India. I sent a specimen over some years ago to be examined at the school of design at Lahore, and it came back ticketed with the remark, "Lahore work; one hundred or one hundred and twenty years old; partly hand-painted." I am sorry I cannot show you an entire curtain: but on the table are little bits which formed part of one of these curtains. In the centre, at the lower part of the curtain, was a sort of ornamental hill, which was filled with birds and lions and other small fry; and from this there grew a tree which filled up the rest of the curtain as far as the borders. A most beautiful production, at once bright in colour without being the least gaudy. Of course, they must have had a complete set of filling blocks (probably one hundred and fifty) to produce a single curtain. After seeing such a fabric, one looks with contempt and pity upon our modern chintzes. I have a strong idea, however, notwithstanding these beautiful productions I speak of, that chintz printing suffers greatly from being relegated to a cheap cotton ground. I do not



say, of course, that there is no use for a chintz on a cheap cotton ground, but I think a day will come when a demand for chintz (especially for use in large towns) on a worsted ground will set in. I lay before you a piece of chintz which was taken off the foot of an old wooden bed, and which had been there ninety years, a Yorkshire fabric (moreen), and printed at Swaislands, in Kent, at the end of the last century. We only want some spirited person to put fine designs into chintz printing, and get the work done on a worsted ground—some William Morris of his day—to find out how much we lose by relegating chintz to a shilling a yard for bedrooms. We have very much to learn in fabrics from the Oriental nations. Apart from the question of fineness (which they can do when they wish), they have several fabrics more or less known under the name of "Kelim," which have a distinctly handsome coarseness, and which, even in the eyes of the European, are not looked down upon as being therefore of low value. Our modern European manufacturers are certainly entirely deficient in this class of fabric. I lately bought a quantity of cotton fabric, made and dyed in Damascus. It is a yard wide, and cost me 8d. per yard. Its character is what I may call a handsome coarseness, and has been much admired by competent judges. It is to be hoped that the modern demand for adulterated fabrics may wear itself out (for dress fabrics it does not matter so much, because their use is ephemeral, and ladies may always be trusted not to buy a thoroughly bad fabric twice), and that ere long the fashion may change in favour of unadulterated fabrics, and especially in favour of printing beautiful designs on worsted grounds, a material calculated to produce at a most moderate price an article of great beauty and great durability. And I think there is no difficulty in colouring on such a ground by the aid of a stencil-plate, adding varied and beautiful colour to a fine design. I hope in a month's time to be able to show you a collection of stencilled designs on a worsted ground, when I will take care that all my audience shall be invited to see them.

Mr. MAURICE B. ADAMS, in proposing a vote of thanks to Mr. Aldman Heaton for his instructive and practical paper, observed that the depressing feature of modern competition was that everyone tried to cheapen the price of all articles to a point at which it was well-nigh impossible to produce a satisfying and durable result. The sum allowed the designer, whether he were the architect of a house or the deviser of a fabric, was generally utterly inadequate when the conditions laid down as to his limit were considered, and he had, therefore, if he would satisfy himself, to make his work generally of set purpose as plain as possible throughout, so that he could insist, at any rate, on having the material and workmanship as good as possible, and, besides, to leave a margin for treating some portion of the work artistically richer. By thus concentrating all the ornament on a few details, while making the general body very plain, a satisfactory result would be arrived at. For the decoration of the sanctuary of a church, a substantial and good fabric for dossals, such as Mr. Heaton had described, and a good carpet, presented a far better effect than a loud and vulgarly-treated reredos, and he was pleased to see that a movement was growing in this direction. He believed there was also a fine future before stencil-work for internal decoration. The paper to which they had listened would be extremely useful for reference, for no book contained such information, nor was so readily put together. He included in the vote of thanks the name of Mr. Croft Smith, who had read the paper for Mr. Heaton.

Mr. G. H. FELLOWES PRYNNE seconded the motion, remarking that during the session now closed they had had a series of practical papers bringing before architects the technical side of the work in a simple way. Architects could not be expected to enter fully into the relative goodness or poorness of fabrics; but such a paper as Mr. Heaton's would enable them to understand the principles underlying the choice of a material instead of depending entirely on the producers and sellers. The majority of church furnishers' designs were very rough and without feeling, and this lack of good designs had led architects to use fabrics. A dignified and lofty dossal was a far better treatment for a sanctuary than the average reredos. Mr. Sydney Vacher, in his recent book, gave the profession some very good examples of designs. His experience was that hangings of mixed cotton and silk wore well, so long as the cotton was confined to the backing.



The PRESIDENT, in putting the vote of thanks, said he believed that technical papers such as Mr. Heaton's were what were wanted at their meetings. An architect was expected by clients to know something of everything, and therefore short cuts to knowledge such as this paper provided were most acceptable. In justice to their clients, architects should know what was wanted, and how to know that they had what was specified. The more largely they could induce the tradesmen of London to take the view of their work held by Mr. Heaton, the better would it be for their clients. In conclusion, the President invited the younger men to take more frequent part in the discussions next session, remarking that they need not fear the reporters for the professional papers, for they were experienced and considerate, and would not allow anyone to make a donkey of himself unless he deliberately intended to do so.

The vote of thanks to Messrs. Heaton and Croft Smith was carried by acclamation, and was briefly acknowledged by Mr. Heaton.

#### DESIGNING OF STEEL BRIDGES, THEORETICAL AND PRACTICAL. —XXIX.

IT might fairly be asked whether the graphic method or that of analytical calculation is preferable, when the object of the investigation is to determine the number of counterbraces necessary in an open-web truss, and the stresses induced upon them. The answer to the question is that if the truss be polygonally shaped, with the different parts of one or both flanges continually changing their inclination to one another at their intersection with the members composing the web, and the latter also, altering their angle of inclination with the horizontal at the same points, it is preferable to employ the graphic method. But in open-web trusses with parallel flanges, and with a constant angle for the value of  $\theta$ , the method of calculation will be found simpler and less tedious. This follows from the fact that as the panel loads, due to the live or moving loads, are all equal, the resulting stress upon any bar of the web which is more remote from the abutment, is greater than that which is nearer, in proportion to the number of loaded panel points between the nearer bar and the one more remote. This is exactly contrary to what occurs in the case of a uniformly distributed dead load, when the stresses upon the verticals increase towards the abutments and not towards the centre of the span. In Fig. 1 let the moving load be supposed to have advanced as far as the point X on the lower flange of the truss, which is equivalent to a weight situated at the point 2. Make this weight equal to W, put S for the span of the truss, L for the length of a panel, and R and  $R_1$  for the reactions at the points of support A and B. Then we shall have—

$$R = \frac{W \times (S - L)}{S},$$

and—

$$R_1 = \frac{W \times L}{S}.$$

But by the design of the truss,  $S = 14 \times L$ , so that—

$$R = \frac{W \times 13}{14}, \quad R_1 = \frac{W}{14}.$$

We are not at present concerned with R or that portion of the load transferred to the abutment A; but it remains to consider the action of the other reaction  $R_1$ , and the manner in which it affects all the vertical and diagonal members of the web through which it is transferred to its final resting-place at the abutment B. In the first place, the portion of the whole weight at 2 in Fig. 1, amounting to  $\frac{W}{14}$ , is supported by the vertical  $a_1$ , which, as already described, has no other stress upon it, except what is conveyed through it to the support A. When this portion of the weight arrives at the point C in the upper flange of the truss, Fig. 1, it is resolved into its components in the directions of C D,

and the diagonal bar K. The former requires no further consideration. It is the latter only which demands attention. According to the rule given, the weight  $\frac{W}{14}$  compresses the bar K.

Here may be at once seen the necessity for considering the action of a moving load upon all the members of the web. Referring to Table II. in our last article, the stress upon K is tensile in character, so that it is evident the live load brings a "reversal" upon the bar K. The question becomes, Does K require counterbracing? It must be borne in mind that there is no live load on that part of the truss between the point 2 and the abutment B. The only tensile stress, therefore, that can be brought on the bar K is that due to the dead load situated between those two points. It will be seen that the whole question of counterbracing turns upon the relation or proportion between the stress produced upon any vertical or diagonal bar of the web by the moving load and that brought upon the same bar by the uniformly-distributed dead load. If the former be of the same character as the latter, it may increase it; if it be of the opposite character, it may cause a "reversal" equal to, greater, or less than the original static stress upon the member. If C be the stress brought upon any member by the live load, and T that caused by the uniformly-distributed dead load, then counterbracing will be required in every bar when the conditions are—

$$C > T.$$

It will be subsequently demonstrated that C follows an increasing arithmetical series, and T a decreasing one, crossing each other in contrary directions. From the data previously adopted, the total amount of the live load for one stress was equal to—

$$\frac{275}{2} = 137.5 \text{ tons.}$$

The total amount of the dead load was equal to—

$$\frac{458 - 275}{2} = 91.5 \text{ tons.}$$

Neglecting the decimals, these figures may be made 138 and 92 tons respectively, which will make the live load exactly  $1\frac{1}{2}$  times the dead load. As at present, it is only the proportion between the stresses, or the amounts of the two loadings transferred to opposite points of support, which are required, the amount of the actual stresses may be left for future investigation. The loads on the panel lengths will bear the same proportion to one another as the total loads respectively due to each other; or calling W the panel load due to the live load, and  $W_1$  that due to the dead load, we have—

$$W_1 = \frac{2 \times W}{3}.$$

The stress in compression, due to the live load upon the bar K, will equal the portion of the load transferred to the abutment B, multiplied by the cosecant of the angle of inclination of the bar to the horizontal, or using the same notation—

$$C = \frac{W \times \text{cosec. } \theta}{14}.$$

This stress will be compressive on all the diagonal bars situated between the abutment A and the centre of the truss, and tensile upon all those between the centre of the truss and the abutment B. It will also be of a tensile character upon all the vertical bars from  $a$  to  $g$ , and of a compressive from  $g$  to  $a_1$ . Following the same principle of the lever, the panel load at the apex 3 in Fig. 1 will be divided between the two abutments in the proportion of  $\frac{1}{14}$  to  $\frac{13}{14}$ ; so that—

$$C = \frac{2 \times W \times \text{cosec. } \theta}{14}.$$

It is evident that by parity of reasoning the portion of the weight at apex 4 transferred to the abutment B will be equal to  $\frac{2}{14} W$  and the stress equal to—

$$C = \frac{3 \times W \times \text{cosec. } \theta}{14}.$$

All these separate stresses will affect all the



diagonal and vertical members of the web in the same manner as already described for the weight at apex 2 in Fig. 1, so we can at once write down the series for the stresses on all the bars from K to K<sub>1</sub>. It will be equal to—

$$W \times \operatorname{cosec} \theta \frac{1}{14} [1 + 2 + 3 + 4 + 5 \dots + 13]$$

For the sake of convenience and simplicity we may take  $W = 10$  and  $W_1 = 6.7$ , as the small errors arising in consequence will be on the safe side. The series may now be written—

$$\frac{1}{14} [1 + 2 + 3 + 4 + \dots + 13].$$

It is an easy matter to tabulate the stresses which are given in Table III. They represent the stresses in tons upon all the diagonal bars of the web due to the action of a moving load advancing successively over every panel point of the truss, and are those supposed to be brought upon the different diagonal members of the web by the passage of one of the heaviest engines and train upon both tracks. As a check, the stress upon the last strut  $j_1$  may be selected. From Table III, the stress is 77.35 tons. The total moving or live load upon one of the main trusses is 138 tons, so that the shearing stress or vertical component of the load at each end of the truss is—

$$\frac{(138 - 10)}{2} = 64 \text{ tons.}$$

Multiplying this product by  $\operatorname{cosec} \theta$ , we have the stress upon the terminal strut of the truss equal to—

$$64 \times 1.2 = 76.8 \text{ tons,}$$

which is practically the same result. It should be observed that the stresses to which the vertical members of the web are subjected by the action of the moving load are the shearing stresses, or the vertical components of those upon the diagonal members. But, as the vertical struts are built up in a manner which, contrary to the diagonal ties, renders them able to withstand "reversals," they need no further consideration, unless the "reversals" should exceed their normal stresses of compression. In the case before us they do not, although it sometimes happens, when the proportion between the live and the dead is very great, that they do, and then the scantlings of the bars, whether vertical or diagonal, would have to be increased. In order to find where the counterbraces are required, we must determine the diagonal bar upon which the "reversal" due to the live load exceeds the normal stress due to that of the dead load. It is not necessary to employ a separate series of calculation for this purpose since the proportion between the total amounts of the live and dead load and Table IV. can be compiled in this manner. Put  $W_2$  for the total load, and, as before,  $W$  and  $W_1$  for the live and dead loads respectively, then—

$$W_2 = W + W_1$$

But from the data already given—

$$W = \frac{3 \times W_1}{2}$$

from which—

$$W_2 = \frac{5 \times W_1}{2}$$

and—

$$W_1 = \frac{2 \times W_2}{5}$$

TABLE IV.—WEB.

Vertical Bars.		Diagonal Bars.	
<i>a</i>	— 6	<i>k</i>	43
<i>b</i>	+ 30	<i>l</i>	37
<i>c</i>	+ 24	<i>m</i>	29
<i>d</i>	+ 17	<i>n</i>	21
<i>e</i>	+ 11	<i>p</i>	13
<i>f</i>	+ 3.3	<i>q</i>	5
<i>g</i>	0	<i>q<sub>1</sub></i>	5
<i>j<sub>1</sub></i>	+ 3.3	<i>p<sub>1</sub></i>	13
<i>a<sub>1</sub></i>	+ 11	<i>m<sub>1</sub></i>	21
<i>a<sub>2</sub></i>	+ 17	<i>m<sub>2</sub></i>	29
<i>a<sub>3</sub></i>	+ 24	<i>l<sub>1</sub></i>	37
<i>a<sub>4</sub></i>	+ 30	<i>k<sub>1</sub></i>	43
<i>a<sub>5</sub></i>	— 6	<i>j<sub>1</sub></i>	48

The stresses due to  $W_2$  can be ascertained from an inspection of Table II. in our last article, and the resulting stresses from the dead load are given in Table IV. As a check upon the two methods, we will select at random the diagonal bar  $p$ . By the formula given, putting  $S$  equal to the required stress, and  $S_1$  that in Table II., the result is—

$$S = \frac{2 \times S_1}{5} = \frac{2 \times 33}{5} = -13.2 \text{ tons.}$$

By the other method of calculation, the stress

TABLE III.—DIAGONAL BARS OF WEB.

Position of Load.	Stress in Tons.													
	<i>k</i> +	<i>l</i> +	<i>m</i> +	<i>n</i> +	<i>p</i> +	<i>q</i> +	<i>q</i> <sub>1</sub> -	<i>p</i> <sub>1</sub>	<i>m</i> <sub>1</sub>	<i>m</i> <sub>1</sub>	<i>l</i>	<i>k</i> <sub>1</sub>	<i>l</i> <sub>1</sub>	
2	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	
3		1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	
4			2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	
5				3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	
6					4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	
7						5.10	5.10	5.10	5.10	5.10	5.10	5.10	5.10	
8							5.95	5.95	5.95	5.95	5.95	5.95	5.95	
9								6.80	6.80	6.80	6.80	6.80	6.80	
10									7.65	7.65	7.65	7.65	7.65	
11										8.50	8.50	8.50	8.50	
12											9.35	9.35	9.35	
13												10.20	10.20	
14													11.05	
Total ...	0.85	2.55	5.10	8.50	12.75	17.85	23.80	30.60	38.25	46.75	56.10	66.30	77.35	

on the bar  $p$  equals the shearing stress on  $e$  multiplied by the cosec.  $\theta$ , from which—

$$S = 11 \times 1.2 = -13 \text{ tons.}$$

It will be seen; on comparing the stresses upon the diagonal bars in Tables III. and IV., that it is not until the moving load has advanced as far as point G on the lower flange of the truss in Fig. 1 that it becomes necessary to introduce counterbracing, which will commence, therefore, at this apex. The counterbracing must be continued to the centre of the girder, and for the same number of panels on the other side of it. Under the action of a uniformly distributed live load, the diagonal bar  $p$  is stressed in compression to so nearly the same amount as when it is acted upon by only a uniformly distributed load, that it is necessary to provide for the "reversal." The same reasoning holds, *a fortiori*, for the bar  $q$ . It has been previously stated that there are two methods of accomplishing this necessary counterbracing. The diagonal bars  $p$  and  $q$  may be made of the same form as the vertical struts, and so be rendered capable of withstanding the "reversals." But the general practice is to leave them to do their duty as ties, and introduce the additional tie-bars, shown by the dotted lines in Fig. 1. The amount and nature of the stresses upon the two counterbraces may be obtained from the data furnished in the tables, and the sectional area can be determined accordingly. It is worth inquiring in what manner, *practically*, the counterbrace G E, for example, is called into play when the moving load has advanced as far as, suppose, the point G. The portion of the load, if there were no counterbrace, which would be transferred to the abutment B would be carried first by the vertical  $e$ , which it would place in tension, and then by the part of the upper flange E F (see Fig. 1) and the diagonal bar  $p$ , which it would place in compression. But as the bar  $p$  is a tie, and not adapted to resist a stress of compression, it would bend, and throw the stress upon the counterbrace G E, which would be in tension. It remains now to add some detail drawings to finish the designs of the bridge, which will complete our present series of articles.

## THE TIMBERS OF AUSTRALASIA.—VI.

### THE HARDWOODS: II. QUEENSLAND (concluded).

THE *Eucalyptus botryoides* is called in Queensland blue gum, but is known in Victoria both as "mahogany" and "red box" (!), and there enjoys the highest estimation. Its native name in the northern colony is "Mungur," and it grows on the banks of the rivers and creeks, and on ground occasionally flooded. The bark is very thick ( $\frac{3}{4}$  in.), and deciduous except a belt about 4 ft. to 8 ft. in height at the bottom of the trunk. The wood is considerably interlocked in the grain, and elastic, and does not readily split in nailing. Consequently it makes excellent weatherboards, and is specially adapted for the felloes of wheels; indeed, it was at one time the only timber used in Brisbane for this purpose. The true *E. botryoides* should not, however, be confounded (as it sometimes is) with a tree very similar in appearance, but with a comparatively thin bark, which grows upon the ridges. The latter timber, though suitable for some local purposes, splits longitudinally in drying, and is perfectly useless to wheelwrights.

The broad-leaved ironbark (*E. siderophloia*), already described under the head of New South Wales, presents two distinct varieties in Queensland. The grey-coloured timber is known by the aboriginal name of "Tanderoo," the dark

red as "Biggera." The latter grows in patches on the ridges, and has a thick ridgy bark. The "Tanderoo" is altogether a far better timber, though it burns more rapidly than the biggera. It grows on the flats and sides of scrubs, has a thinner bark, is less pipey in the wood, and tougher, and suffers less from the depredations of insects. While the *E. siderophloia* proper to New South Wales is highly-esteemed in that colony, the tanderoo variety is no less so in Queensland, where it is largely employed by the engineer for piles, beams, the planking of wharves and bridges, and railway sleepers; by the architect for principals, joists, rafters, studs, and shingles; by the shipwright for keels, beams, and planks; and by the wheelwright for naves and spokes.

The sour plum (*Oswenii venosa*, Nat. Order Meliaceae) is a fine shady tree, common in the Queensland scrubs, and sometimes found in New South Wales; it attains, however, a height of only about 30 ft., with sometimes a diameter of 3 ft. The wood is of great strength and hardness, with a weight of 63 lb. per cubic foot. Its durability is shown by a slab in the Sydney Technological Museum, which was seasoned 35 years ago and exhibited at the London International Exhibition of 1862. It is easily worked and takes a good polish, and its bold and handsome figure must always give it a high value as an ornamental timber for cabinet-work, in which it is invariably admired when used. Its great weight and hardness, however, coupled with some liability to tear with the plane, rather militate against its general employment for this purpose.

Two species of *Eleocarpus*, a genus belonging to the Natural Order *Tiliaceae* (Lindens), are mentioned by Mr. F. Manson Bailey, Government Botanist of Queensland, in a Supplement to his "Synopsis of Queensland Flora." These are *E. Bancroftii* and *E. Kirtonii*. The former is named after Dr. T. L. Bancroft, who collected the woods of the Johnstone River for the Indian and Colonial Exhibition held in London in 1886. Both are tall and handsome trees, often reaching over 100 ft. in height, and producing fine timbers. The wood of the Bancroft species, which attains a stem diameter of 2 ft. or more, is particularly hard and durable, light in colour, with a darker centre, and strongly resembling the American *lignum vitae* (*Guaiacum officinale*), for which it would seem to be an efficient substitute. The bark is scaly, of a brownish colour, and about  $\frac{1}{2}$  in. in thickness; but I am unable to obtain further information respecting either the timber or its practical employment. The Kirton species is better known, and is generally called white beech, sometimes (though quite improperly) "mountain ash," and in New South Wales (where it is also met with) "Illawarra ash." The wood is light brown in colour, possesses a fine grain, and somewhat resembles English sycamore. Though generally considered a hardwood, it dwells rather on the borderland of that great class, as, though it becomes extremely hard in drying, it will not stand for outside work. Locally, it is employed with every success for flooring-boards, and it is particularly suitable for furniture required to stand rough usage. Both these timbers find a place in Mr. J. L. Maiden's excellent volume, "Useful Native Plants of Australia," and the Sydney Technological Museum possesses a specimen of *E. Kirtonii* from Southern New South Wales.

There is still another exportable hardwood peculiar to Queensland, and mentioned by the former of the above-named authorities, the *Banksia Bancroftii* (Nat. Or. *Myrtaceae*; Tribe, *Myrticeae*). It grows on the Johnstone River, where



it is called "Johnstone River, or Langdon's, hardwood." It is a tall tree, with a persistent, thin, and somewhat scaly bark. The wood is of a light grey colour, and rather dark towards the centre in the large trees, close, hard-grained, very durable, something like teak, and very useful as a building timber, splitting freely and straight.

### III.—VICTORIA.

Victoria, by far the smallest of the continental colonies, but, next to New South Wales, the most important of them all, not only in point of population, but in many other things—with an area scarcely more than one-twelfth that of Western Australia, but with about eighteen times her population—has much in common with the mother colony in the matter of her timber resources. The western line of longitude dividing her from South Australia is the same as that of New South Wales, while in both cases the eastern boundary is the Pacific Ocean. But lying as she does directly south of the parent colony, with no seaboard to the east proper, but only to the south-east, and with the greater portion of her coast-line fronting the Tasman Sea and Bass's Straits, a very different climate prevails from that of her northern neighbour; and this naturally affects her timber growth in common with all other kinds of vegetation, and predisposes her forest products to approach, in various instances, those of insular Tasmania, rather than those of continental New South Wales, in some of their most marked characteristics. State forest conservation in Victoria dates back about seven years, and upwards of 4,000,000 acres are now devoted to that purpose. The ironbarks, the stringybarks, the various box timbers, and the several gums are most of them either indigenous to the colony or have been successfully naturalised; while the yellow stringybark (*E. muelleriana*), which occupies a leading place among the native hardwoods, is peculiar to Victoria. The same timbers do not, however, always display the same characteristics in that colony as they do in New South Wales. The ironbarks are represented chiefly by the species *E. sideroxylon* (red-flowering ironbark), which, as was pointed out in the second of these articles, is by no means the most valuable of them; hence the extremely high reputation that these timbers bear across the Murray can scarcely be said to be maintained by their representatives in this colony, and their place is somewhat usurped by the red and blue gums, the Victorian mahogany and box. Then, again, the stringy barks exhibit special characteristics, and Mr. Perrin, the Victorian Conservator of Forests, asserts that a well-matured stringy bark, grown in a dry place on a hill-side, will produce a grain so hard, firm, and close as to make the wood liable to be mistaken for blue gum by anybody but a thorough expert. Mr. Perrin places the Victorian blue gum (*E. globulus*), yellow stringy bark, and Victorian mahogany (*E. botryoides*) in the front rank of his colony's timbers for marine and harbour works; the Murray red gum and the white box for railway constructive work; the stringy barks generally for building operations, and the manna gum and grey gum (*E. gonicalyx*) for general purposes.

The Victorian (or Tasmanian) blue gum (*E. globulus*) is undoubtedly the most valuable timber, taken all round, that the enterprising little south-eastern colony possesses. It attains a height of from 200ft. to 350ft., with a stem diameter of from 6ft. to 25ft., and shipbuilders can procure keels of this timber 120ft. long; they employ it besides for planking and many other parts of vessels, for which purpose it is considered superior, in many respects, to American white oak. In durability for shipbuilding it is excelled, according to the estimates of the committee of Lloyd's, by eight timbers only from all parts of the world, one of the foremost of which is the broad-leaved ironbark (*E. siderophloia*) of New South Wales, and the number of years assigned to it in this connection varies from eight to twelve, according to the particular part of the vessel in which it is used. The hardness, density, and weight of the timber, combined with its extreme durability, place it in a leading position among hardwoods. For marine work it is particularly suitable, since the presence of kino-tannic acid in the wood, together with the great hardness of the grain, wards off the attacks of the colera for a considerable time—in fact until the action of the seawater nullifies the effect of the acid, and so opens the way for the exercise of the insect's destructive proclivities. The toughness and elasticity of the

wood are another factor in its favour, producing a remarkable capability of withstanding an extreme transverse strain, while the power of resisting a vertical or crushing strain is equal to 3·078 tons to the square inch, as ascertained by experiments made with 2in. cubes. The extreme elasticity enables it to withstand the blows of the heaviest "monkey" used in pile-driving, without curling over or rending; and this strongly-marked property of the wood is shown by the fact of a rebound of several inches after every blow of the pile-driver, often necessitating the employment of rope or old bagging to check it. But while largely used for harbours, jetties, wharves, bridges, and all sorts of structures in or close to the water, this blue gum is also in extensive demand by coachbuilders, and it is one of the four colonial timbers recommended by the Victorian Carriage Board for the construction of railway carriages. For undercarriage work, the poles and shafts of both light and heavy vehicles, swivel-trees, spokes and rims, axle beds, and so forth, it bears the highest reputation; while it is no less serviceable for telegraph poles and railway sleepers, though for the last-named purpose the Murray red gum has of late years been preferred by the railway authorities of Victoria. Then, further, apart from engineering uses, this timber is ordinarily suitable for many architectural purposes, such as floors, doors, dadoes, &c., and also for cabinet work. It lends itself to wood-carving with singular facility and success, and there were lately to be seen in Melbourne a tall standard hall clock-case of quasi-Gothic design and some exquisite decorative panels in *Cinqueto* constructed of this wood, and beautifully carved by a resident wood-carver, Mr. W. Howitt.

It scarcely falls within the scope of these articles to speak of the sanitary and hygienic advantages attending the cultivation of many of the Eucalypts, and especially the peculiarly aromatic *E. globulus*, on account of the powerfully antiseptic properties it possesses. But those benefits have been widely experienced in many parts of the world, either where this blue gum is indigenous, or to which it has been translated, its effect in subduing malaria being very striking, and perhaps nowhere more so than in the Roman Campagna, where it was planted by the Trappist monks in 1869. Indeed, in the southern part of Europe it is known as "fever-tree," and India, Turkestan, Portugal, Algeria, Jamaica, Florida, California, Guatemala, and Brazil, amongst other countries, can bear witness to the salubrious as well as the commercial value of this Eucalypt, and the speed and readiness with which it thrives. Though naturally growing in sub-Tropical, or tolerably warm, temperate regions, the tree is hardy enough to stand a temperature of 19° Fahr., though some years ago the plantations on the Black Sea perished under two additional degrees of frost. Readers who may be interested in the subject I may refer to the various writings of Baron Ferdinand von Müller, K.C.M.G., &c., Government Botanist of Victoria, which, in the old country, will certainly be found in the libraries of the British Museum and the Imperial Institute, and probably in at least those of the Royal Geographical and Linnean Societies. The weight of the Victorian blue gum varies from 60lb. to 70lb. per cubic foot. In New South Wales the tree attains very much smaller dimensions than those above-mentioned, and is found only at from 2,500ft. to 3,000ft. above sea-level, while the wood is less free in the grain than that of Victorian production.

Next in value of the Victorian timbers, for marine work, in the opinion of the local experts, is the yellow stringybark (*E. muelleriana*), named after the Government botanist; indeed, with some authorities it occupies the first position of favour. It is littoral, species growing upon sands and sandy clays in the western half of Gippsland (the south-east portion of the colony), where it occupies fully 300 square miles, principally between the Hoddle Ranges and the sea coast. The maximum height of the tree is 170ft., but more frequently 100ft. to 150ft. The bole is straight and massive, with a persistent, fibrous, deeply and coarsely-fissured dark-grey bark. The wood is rather dark in tint, fissile, free from gum veins and shakes, clear in the grain, and of almost phenomenal durability. The timber has long been used for such local purposes as fencing, &c., and in South Gippsland posts may be seen which have been standing in the ground for nearly forty years. It is only within the last few years, however, that the value of this yellow stringybark has been recognised for

marine and harbour work. Indeed, its diagnosis may be said to date from 1890, as the first mention I can find of the timber—a mention kindly pointed out to me by the authorities of the Sydney Technological Museum—is in a paper on "The Eucalypts of Gippsland," read by Mr. A. W. Howitt, F.G.S., F.L.S., before the Royal Society of Victoria, on July 10, 1890, and published in the *Transactions* of that body. To Mr. Howitt is due the differentiation of this timber from its nearest congeners, *E. capitellata* and *E. Eugenioides*; and he concludes his notice of it in these words:—"I feel that, being fortified by the opinion of our greatest authority, the venerable author of the *Eucalyptographia*, I may establish this Eucalypt as an independent species, under the designation of *Eucalyptus muelleriana*."

An exceedingly important position among the Australian hardwoods is that occupied by the splendid River Murray red gum (*E. rostrata*). This exceptionally fine timber is found in all the continental colonies, but particularly on both sides of the Murray where that river divides Victoria from New South Wales. It is regarded, however, as specially a Victorian timber—partly because the paucity of that colony in ironbarks has led to the red gum occupying a leading position, and partly by reason of the culpable neglect till recently of the red-gum forests of New South Wales. According to a State Paper presented to the parliament of the latter colony in September, 1895, the largest and most heavily timbered reserves on the right bank of the Murray contain no less than 260,000 acres of red gum, yet, "had the demand of a few years back continued" (when an effort was made to supplement, from the reserves, the Victorian supply, in order to meet the enormous demand in that colony), "it would have been impossible for our forests to have kept up the supply in their unassisted state." Moreover, Mr. J. V. de Coque, Timber Inspector to the Public Works Department of New South Wales, in a paper which he read before the local Royal Society on August 1, 1894, unsparingly condemns the *E. rostrata* of his own colony. He says:—"I have taken some trouble to ascertain the true value of the Murray River variety, and have no hesitation in pronouncing it a most inferior timber for use in public works, as well as for general building. Comparing it only with the same timber of Victoria and South Australia, I attribute its inferiority to two causes, which [to cut short his explanation and illustrations] are rapid growth and excessive moisture." The tree is large and of spreading habit rather than tall, the average height being only 100ft., but it develops a large bole of from 6ft. to 10ft. diameter at the base. It attains its largest growth where moisture is abundant, but develops the best timber on hilly country, and even in the desert parts of the interior, where, however, it is always found by creeks or waterfalls. The timber grown on hilly ground can scarcely be excelled, though it is somewhat lighter in weight than that grown on rich, moist land; the weight of the seasoned timber per cubic foot varies from 50lb. to 70lb. according to the situation. It takes its name from the dark red colour of the wood, which frequently resembles the best mahogany; and in spite of its extreme hardness it is easier to work than many of the gums. It has a remarkable record in Victoria for durability in public works, particularly in longitudinal beams, in railway bridges, and as sleepers, and when sawn into small sizes will dry and season evenly. Single trees, felled and converted into sleepers under departmental supervision, have produced 100, 200, and even 250 sleepers of dimensions 6ft. 6in. by 8in. by 4½in. The *E. rostrata* is an excellent girder wood, inferior only to the best ironbarks. Its strength, and especially its durability, make it largely employed for posts and piles in damp ground, where it will last for thirty years or more; while its very considerable resistance to the *Teredo navalis* (as well as to fungoid diseases and the white ant) places it high among the timbers adapted for shipbuilding and marine work. For wood-paving blocks it ranks next, perhaps, to the blackbutt and tallow-wood of New South Wales, and is one of the timbers employed the most largely for street-paving in Melbourne. For numerous purposes in connection with housebuilding, for coachbuilding and a variety of general purposes, this red gum is of great value, and where exposed directly to friction it possesses the advantage of wearing smooth without splintering. When employed for piles, Mr. de Coque advises its being used, where possible, in the round, unheven and unsquared,



and then driven with the bark on, to allow of the sap-wood seasoning slowly, and so avoiding the tendency to split and open, which is somewhat characteristic of the timber, when the sap-wood is removed before the heart-wood is completely dry. As a furniture timber, especially for veneer, the *E. rostrata* is deservedly esteemed on account of the beautifully mottled and wavy figure it possesses; while a handsome piece of florid Renaissance carving, lately executed in Melbourne by Messrs. Treede and Prenzel, shows how well the wood can lend itself to the carver's tool, notwithstanding the "hooked" and interlocked character of its rather short grain.

The forest red gum (*E. tereticornis*) greatly resembles its immediate congener of the Murray, though it is less valuable. It is always found on open forest or alluvial country, and almost invariably near watercourses, and it usually varies from 60ft. to 90ft. in height, occasionally, however, reaching 150ft., with a diameter of 18in. to 36in., and, exceptionally, 6ft. The wood is heavy and close-grained, hard and durable, though apt to warp in seasoning, and much like the Australian cedar (to be mentioned after the hardwoods are disposed of), in its red colour. It is employed for the same general purposes as its ally described above, or, at all events, for the less important of them; for, though undoubtedly a fine and valuable timber, it can scarcely be said to possess the same unquestionable record as the *E. rostrata*, except in the one point of durability—a quality of the *E. tereticornis* which has been long and completely established. The excellent qualities, however, of this timber have probably been overshadowed by the exceptional merits of the Murray gum. Certainly, Mr. de Coque condemns it, remarking that "the architect, in particular, would do well to avoid all red gums." But then he is speaking of the timbers of New South Wales. In Victoria, on the other hand, it bears a high reputation for general building purposes, and even Mr. de Coque admits its excellence for wheelwright's work; while for wood-paving blocks it seems to possess every requisite, and to be quite equal to the *E. rostrata*. Its weight in pounds per cubic foot is given by Prof. Warren at 57.33.

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## COUNTY LUNATIC ASYLUMS.—XLIV.

By GEORGE H. BIBBY, F.R.I.B.A.

### ORIGIN OF MODERN PLANS.

IT is interesting to note, both in England and in the principal countries of Europe, during the past century, that the prevailing architectural features of convents were adopted by the asylum builders of the time, as appropriate to institutions for the insane; and hence the construction of such hospitals as those of Bethlehem and St. Luke, and, as the result, the introduction of the corridor and cell system in our asylums generally, as well as in those of other nations.

Although a few of the transformed convents may be said to have fairly served the purpose of asylums, it is doubtless true of by far the greater proportion that they were most unfit receptacles for the insane. An opinion quickly gained strength (both in this country and upon the Continent), that an important condition of success is that the curable should be separated from the incurable insane. The intermingling of recent cases with incurable cases and with epileptics exerted an influence upon the former in the highest degree injurious. Apart from this, the two classes of insane require for their treatment and protection arrangements differing in many particulars, and, naturally, the area of the asylum would by such mingling become so occupied with incurables that it could no longer afford facilities for treatment or proper accommodation for curable or recent cases. In certain Continental asylums different departments of the same institution had long been set apart, the one for cases requiring active treatment, and the other for such as had become chronic; but another principle was later adopted both in England and abroad, where separated and special asylums were erected for the two classes of curable and incurable patients. Various reasons were assigned for this arrangement of special hospitals for treatment of curables and asylums for incurables. It was desired to bring into practice these new attempts at reform in asylum concerns (which were associated with much expense), at first only for those of the insane who were considered curable. New asylums were therefore built for that purpose; while the old buildings,

which had been found quite inefficient for the carrying out of attempts at cure, were, with a few alterations, converted into asylums for incurables. It was soon found that the organisation of asylums for incurables would have to be in many particulars essentially different to hospitals for the treatment of recent cases, inasmuch as in the former case nearly all have to remain during their entire subsequent lives, while in the latter their residence would be probably more or less of a temporary nature.

Should a separate chronic patients' asylum be erected, it should not be a place quite retained for incurables, for although to be fitted up and designed for the reception of old chronic cases, yet the means of recovery ought still to be present, even though the hopes of recovery may be but very slight. But in chronic asylums patients do sometimes unexpectedly recover. Further than this, some authorities are of opinion that the quiet and well-behaved incurable insane may, perhaps, without harm, be put to dwell amongst the recent and incurable cases. And some asylum officials have recognised in the presence of a stock of long-disciplined but incurable patients a beneficial and essentially curative element for the newly-admitted patients, and the system of mingling the incurable (of the quieter classes) with the curable has been adopted both in England and on the Continent with satisfactory results; and a recent writer upon the subject of asylums maintains "that any reform of the present asylum system must find its chief development in the multiplication and perhaps the modification of the existing admission or reception wards. A rigid separation of the hospital for curable cases from the main asylum, the functions of which would be chiefly protective, would be a great error. Everyone with any knowledge of asylum management knows that the hope of discharge is the first great factor in rendering the insane amenable to discipline and treatment. The prospect of future liberty—no matter how distant—is the one bright ray which lightens the asylum gloom."

There are, then, two modes by means of which the curable and incurable patients may be housed separately—in the first instance, in the detached blocks of buildings forming the ordinary large asylum; and, in the second instance, in a series of smaller asylums, each planned especially for either class of patients. The buildings for the smaller asylums would necessarily be far more costly in proportion, inasmuch as it would be necessary to provide for each institution separate administration buildings, kitchens, laundries, &c., which, being upon a smaller scale, would be proportionately more expensive as regards not only the buildings, but the machinery and divided superintendences. These are amongst the disadvantages of asylums of limited extent, which, however, have much to be said in their favour as regards the facilities such buildings afford for the advantageous treatment of the patients, and in respect of the frequently higher percentage of recoveries resulting therefrom.

The conversion of private mansions into public asylums has perhaps been far more common on the Continent than in this country, and although of late years a few here have been successfully so converted, the system is one that has little to recommend it beyond reasons of economy; but of the several kinds of accommodation set apart for the insane, that in connection with the buildings and administration of general hospitals on the Continent is said to have been by far the worst. Hospitals and asylums have practically been formed (in former years) as institutions under one roof in nearly all the principal countries of Europe. It was most common in Italy, Spain, and Belgium, but was also found frequently in Germany and Russia, and more seldom in France; it was to be seen at Verona, Padua, Rome, Ancona, Trieste, and other Italian cities; at Seville and Saragossa in Spain; at Berlin, Breslau, Brunn, Cologne, Danzig, Frankenthal, Gratz, and various other cities of Germany; in the hospitals of St. Petersburg and Moscow, at Montpellier, Lyons, and elsewhere in France.

Until about thirty years ago the best Continental asylums are said to have existed at Auxerre, Marseilles, Quatre Mare (Rouen), Grenoble, Ghent, Meerenburg, Ellenau, Halle, in Saxon Prussia (a building erected long before that of which I gave plans in the BUILDING NEWS of Feb. 14, 1896, p. 229, and Feb. 28, p. 303), Chambéry in Savoy, and Heppenheim in Hesse.

About thirty years ago the largest asylums on the Continent were the Salpêtrière with 1431

female, and the Bicêtre with 980 male lunatics; the Maréville, near Nancy, with 1,200 inmates; the Vienna asylum for 800; and asylums at Lyons, Lemberg, Marseilles, and Stephansfeld, provided each for about 700 patients; but these were examples of Continental asylums of unusual magnitude. Even at that period it was considered that the numbers of the insane brought together under one roof was excessive in many asylums, and it appeared to be the opinion of the Continental experts of the day that asylums should not be for more than 500 patients; but the usual practice was to build them for a smaller number.

Whatever may be the differences between the buildings of English and Continental asylums at the present time, there is evidence to show that in former times the arrangement and construction of asylum buildings was to a considerable degree influenced by the difference in the arrangement for the supervision of the institutions. The Continental asylum architect had an entirely opposite principle to provide for to that which was required of the English architect.

On the Continent, the necessity of a medical staff in a greater proportion to the number of inmates was earlier recognised, and the value of observation wards and of individual treatment and supervision was well appreciated; even in small asylums of 200 inmates the physician-in-chief had one or two medical assistants.

In England, the medical superintendent of most asylums has long been hindered or prevented from giving that direct observation to his patients, and that individual attention to his duties (so necessary for the patient's welfare) by reason of many occupations forced upon him, in the form of reports, statistics, &c., many of which might be performed by persons other than medical men.

As an example of an asylum arranged upon a bad system may be named that at Caen, which belonged to a religious sisterhood. This was a singular instance of toleration in France—a circumstance attributable to the unwillingness of the governments to interfere with privileges accorded in a previous generation to a religious sisterhood, although those privileges had become incompatible with the welfare and happiness of those intrusted to their charge. Its patients were simply passed over to the nuns, who assumed all authority in the organisation and management of the inmates, exercised severe restraint, seclusion and penance at their discretion, and opposed improvements, which they could not understand, as antagonistic to the prejudices of the period. They supplied medical treatment by engaging the services of a physician, resident at some distance from the asylum, to prescribe for the sick.

It may be gathered from this that the buildings were structurally unfit for an asylum, that restraint was more practised than now, that the means of recreation and employment were very limited, and this asylum at Caen was not only used for the care of the insane, but had under the same roof a large boarding school for girls!

The subject of the plans and designs for the asylums of former times is full of interest, but is too extensive to be included in these articles, which I must now hasten to bring to a conclusion.

(To be continued.)

## CONCERT-HALLS AND ASSEMBLY-ROOMS.—XVI.

By ERNEST A. E. WOODROW, A.R.I.B.A.

IN planning a concert-hall architects too frequently forget that very large numbers of people are seated in the choir and orchestra, and that these people quite as much as the audience require to have safe entrances and exits. Those who know the majority of the London concert-halls are well aware of the want of provision for those who occupy seats in this part of the house. Frequently, too, it must be remembered, the orchestral seats are occupied by the public themselves at meetings and at concerts where no choir is engaged, so the exits from this part of the house should be looked upon as public exits quite as much as any other exits are.

The entrance to a large concert-hall should be so planned as to admit vast numbers of people without unduly crushing. To the booked parts of the hall, where people arrive in carriages, as much space as possible should be allowed for the audience to alight from their carriages under cover. In close proximity to the vestibule should



be the cloak-room accommodation, with ample room for the hanging up of the hats and coats. In this respect the last concert-hall erected in London is sadly wanting. With regard to barriers checking the inrush of people past the pay-box, far greater attention should be given to this detail in buildings of this class than is done at present. It is quite as necessary that people should enter a concert-hall without the risk of personal injury by crushing as it is for them to file past the pay-box of a theatre in an orderly manner. This is a point which is often too lightly treated by even the expert designers of theatres, and is indeed totally ignored

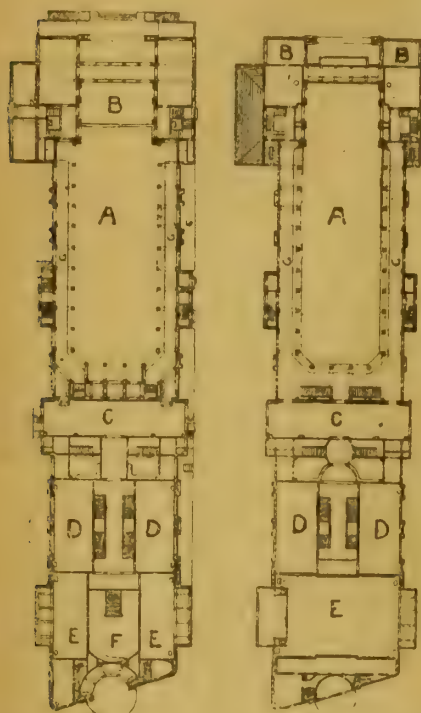


FIG. 1.—A, concert-hall; B, orchestra and stage; C, gallery; D, club-rooms; E, club-rooms; F, vestibule; G, gallery.

FIG. 2.—A, concert-hall; B, retiring-rooms; C, club-rooms; D, club-rooms; E, minor hall.

by the architects who build concert-halls. The consequence is that we too frequently find that the pay-box, an after-thought, is but like a wooden sentry-box placed in the passage, diminishing its width and the value of the exit. The barriers, too, are movable like wooden hurdles, easily overturned and forming an impediment and obstruction of the greatest danger to an outrushing crowd.

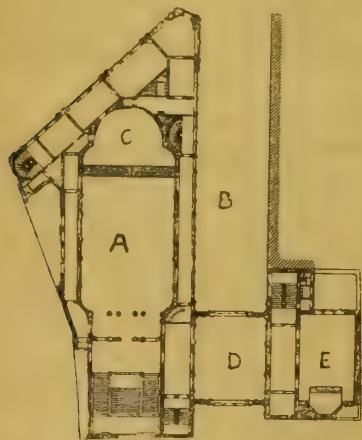


FIG. 3.—A, concert-hall; B, street; C, orchestra; D, foyer; E, minor hall.

Of late years the London County Council have devoted much attention to this matter; but it is impossible, even with the most ingenious contrivance of collapsible barriers, to obtain the same result and the same good and safe entrance which should exist in the original building. In my

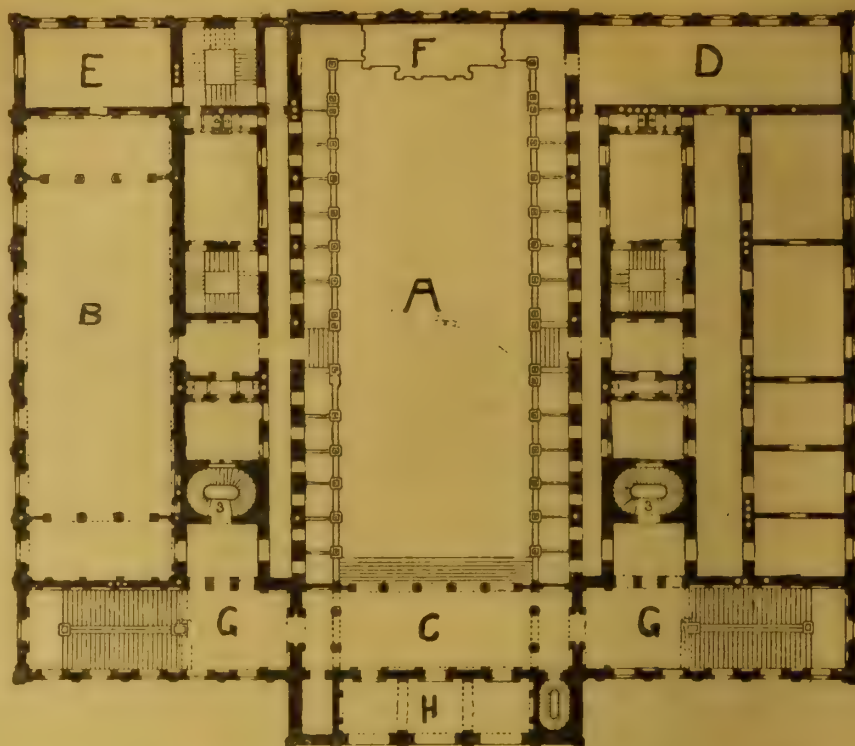


FIG. 5.—A, concert-hall; B, minor hall; C, vestibule; D, musicians' room; E, musicians' room; F, organ; G, grand staircases.

papers on Theatres, illustrated in the BUILDING NEWS, Oct. 21, 1892, I showed, both by diagram and description, how a crowd should be led, one by one, past the pay-box, through a narrow entrance, yet have the full available width of the passage for exit without any obstruction. This is done by leading off a narrow passage from the wide passage, which, after passing the pay-box, again enters the main passage. The narrow passage is, of course, not used at all for exit. I know nowhere where this system has been adopted in a concert-hall, although the necessities are as great as in a theatre.

Where concert-halls are built with tiers or galleries, each tier should have its separate entrance and its separate exit. The width of these should be in no case less than 4ft. 6in. This dimension applies equally to passages, doorways, and staircases.

One word as to construction. Although there is presumably not the same danger from fire in a concert-room as in a theatre, owing to the absence of the stage and the scenery, yet from recent cases of fires in public buildings which have occurred even during this year we learn that many conflagrations originate in the auditorium, and this is undoubtedly due to smoking and the smouldering of tobacco and matches thrown down on the wooden floor, probably falling between the open joints of the floorboards into the space beneath. It may be said it is only in music-halls, not in concert-halls, that smoking takes place; but my answer to that is that a good many smoking concerts are given annually in concert-halls, and it is for this reason that the auditorium of a concert-room should be constructed of fireproof materials, with tiers constructed of concrete, as in a theatre.

The absence of columns supporting the galleries, and the adoption of the cantilever system, is as great an advantage in a concert-room, perhaps even greater than in a theatre, as there is then no obstruction either to the sound-wave or to the sight.

The Liederhalle (Figs. 1 and 2), in Stuttgart, is a building of unusual length, which is due to the fact that it has been prolonged and added to since it was first erected in 1863. Then it consisted simply of assembly-rooms, with a hall on the upper floor. In 1874 was added the large hall and adjuncts, the full width of the old building. Two staircases lead from the hall at the end of the old portion of the premises to the galleries above. At the opposite end of the hall is a movable orchestral platform, which can be converted into a stage for occasional theatrical performances. The small hall in the front of the building has also a stage.

The concert hall at Frankfurt (Figs. 3 and 4),

designed by the architect Mr. H. Burnitz for the Dramatic Society, is upon a site of peculiar and unsatisfactory outline, as the building is cut in two by a street with the large concert-hall on one side and the small music-room on the other. In order to make a connection between these rooms a foyer was built in the form of a bridge across the street, which at the same time served as the covered carriage porch to the main entrance below, which was purposely placed at this point.

The building on the south side consists of the great hall and grand staircase and restaurant; that on the north side consists of the small hall and manager's rooms. The large hall measures 42.69 metres long by 16.22 metres wide and 13.95 metres high. The seating accommodation is for 900 persons, and there is standing room for 450 more. There is a movable



FIG. 4.—A, concert-hall; C, gallery; D, corridor.

orchestra for 50 to 60 performers and seats for a choir of 200. The small hall, specially built for chamber music, is 15.4 metres long by 10.24 metres wide, and on account of its position, being built in on all sides, it obtains its light from the roof. It is said to accommodate 415 persons (325 seated and 90 standing), while 200 more can be got into the side gallery; but, judging from the plan, one would gather that these numbers could not be admitted without unduly crowding the room beyond its "safe" capacity. The foyer connecting the two buildings measures 15.4 metres by 13.1 metres, and is used as a refreshment-room.



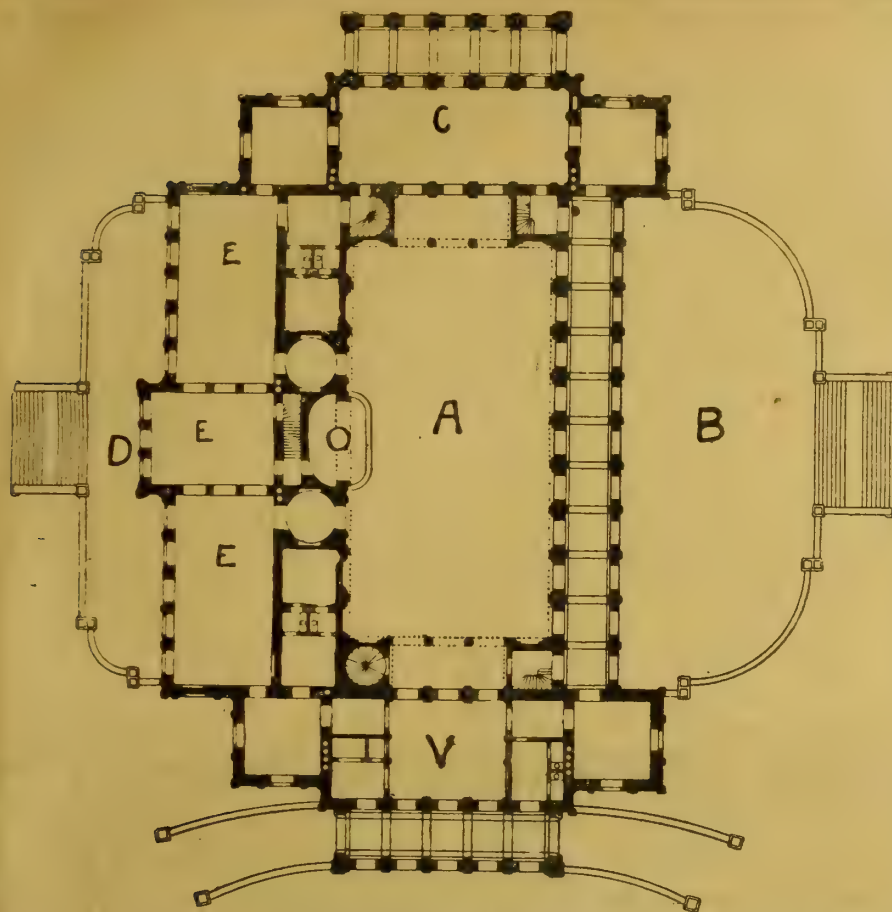


FIG. 6.—A, concert-hall; B, terrace; C, dining-room; D, terrace; E, ladies' saloons; F, ladies' saloons; O, orchestra; V, vestibule.

The Musical Union (Fig. 5) in Vienna was opened in January, 1870. The building was erected from drawings by the architect, Baron Hansen, and it contains two large halls, of which the greater, or concert-hall, has a seating capacity of 2,000, with an orchestra capable of holding 500

the ground floor being occupied by the approaches, cloakrooms, and vestibules, which are on an extensive scale. Right through the centre of the building is a carriageway, from which people can alight under cover at the foot of staircases, which lead therefrom directly into the hall above. From the front vestibule two wide staircases, to the right and left, are approached (Fig. 5) delivering at the back of the hall. The two small circular staircases lead down to the covered carriage-way already mentioned, while the remaining staircases afford extra means of egress.

The large hall is 13.9 metres wide by 31.92 long. At a height of 1.11 metres there is a raised platform running round the room. This platform is only 2.2 metres wide, above which, at a height of 5.98 metres, is a gallery of the same width fitted with "tip-up" seats. There is another tier over this part. The height of the hall is 17.7 metres, and daylight is obtained from all four sides by means of 48 windows.

The smaller hall is 10.42 metres wide, and has an arched ceiling 10.4 metres in height at the sides, measuring 11.4 metres high in the middle. There is one gallery in the hall, 1.25 metres in width. A peculiar feature in both these halls is that the Royal boxes are arranged on the sides and not in the centre at the end, as is more often the case in public buildings. In order that the revenue of the building should be as large as possible, a part of the ground floor is occupied with shops, dwelling-rooms, and restaurant; while on the top stories are rooms let off for music-teaching rooms and practice rooms in connection with a conservatoire.

The Alpine resort of Ischl is yearly filled by numerous visitors who frequent the place for pleasure and renewal of health. In order to meet the demands of the former, the town erected in 1872-1875 a concert-hall as shown in Fig. 6, and built it in a splendid situation surrounded by a park. In the plan, it will be seen the orchestra is placed at the side, not at the end, as one is accustomed to find it; the reason is, that the building is not solely used for concerts, but dances and other entertainments are held therein as well. The large ladies' saloon, the reading-room, and dining-rooms all point to it being a place of entertainment meeting all demands of a pleasure resort. A covered drive is placed before the vestibule, which is on the south, with porter's

box and pay-place on one side, and cloak-rooms on the other. To the east and west are terraces, special features of the building, being greatly in request for people "lounging" in the open air on a summer day. In the basement one finds the administrative offices, guest-rooms, and musicians' room in direct communication, by means of a special staircase, with the orchestra.

Fig. 7 represents a large concert hall at Charlottenberg, in Berlin, known as the "Flora" Hall. This building was erected in 1872-74 by the architect, Mr. H. Stier. The building extends lengthways north and south, and on one side of it is a large palm-house, extending over an area of 2,750 square metres. The necessary forcing houses for the plants are situated in another part of the grounds, and connected with the palm-house by a covered way. The building itself occupies an area of 1,028 square metres, while the concert hall measures 48.18 metres long by 22.75 metres wide, and 28 metres high. It is surrounded on two sides by a corridor 2.8 metres wide, the windows from which open on to the palm-house on the one side and a terrace on the other. The floor of the palm-house is 2.5 metres below that of the hall, so that from nearly all points of the hall the plants can be seen, creating a pleasing and novel effect. The rooms which surround the great hall are carried up two stories, and the basement is occupied by the offices, kitchens, cellars, billiard-rooms, and refreshment department. At one end of the building is a large dining-room.

#### THE SURVEYORS' INSTITUTION.

AT the ordinary general meeting of this society on Monday evening last the discussion was resumed of Mr. R. M. D. Sanders's paper on "Landlord and Tenant in Ireland," read at a previous meeting.

Mr. T. R. Garvey, after thanking the institution for having elected the members of the Irish Land Agents' Association, some two hundred in number, as Fellows, proceeded to discuss the Bill now before Parliament. It was most desirable that a fair and just settlement of the Irish land question should be arrived at, and the Bill was, he thought, a step in the right direction. But his countrymen were not so unlike the rest of mankind as to be able to forbear asking if they knew whether anything more was to be obtained. Landowners in Ireland had absolutely no voice in fixing their rents unless the tenancies had been created before 1881, and it was very desirable that the Court which had this immense power of fixing rents should be composed of men of experience as well as integrity. He was afraid that some of the present day sub-commissioners, though actuated by the best motives, had little practical experience in farming and the arts and sciences on which it depended, and that few of them would pass the Professional Associates' Examination of the Institution. The conditions of agriculture in Ireland and in England were not precisely similar. In Ireland there was little of the stiff clay which made wheat growing so difficult, and the system of small farms was admirably adapted to the needs of the country. Farming was still remunerative; but not, of course, so profitable as a few years ago.

Colonel Lowry said that the tenants' view of the question was well known to every reader of a newspaper, but the landlord's side was less generally understood. Mr. Gladstone, in introducing the Bill of 1881, had expressly acquitted the landlords of Ireland of the charges of injustice and tyranny which had been brought against them, and yet under that Bill there was not found one rent which was declared to be "fair" in all Ireland. The principles of political economy had been then, it was said, "temporarily banished to the planet Saturn;" but every fresh Bill had driven them further and further. But yet, in spite of legislation, they still maintained, if rents were reduced, tenant right went up in value, and now sold at a higher price than ever. In concluding, Col. Lowry bore testimony to the conspicuous honesty which, in spite of inducements and incitements, still characterised the Irish tenant farmer.

Mr. G. de L. Willis (secretary to the Landowners' Convention in Ireland) said the Bill gave greater facilities for land purchase than had ever before been suggested. The provisions of all land-purchase schemes were necessarily hampered with a number of complicated financial details which it

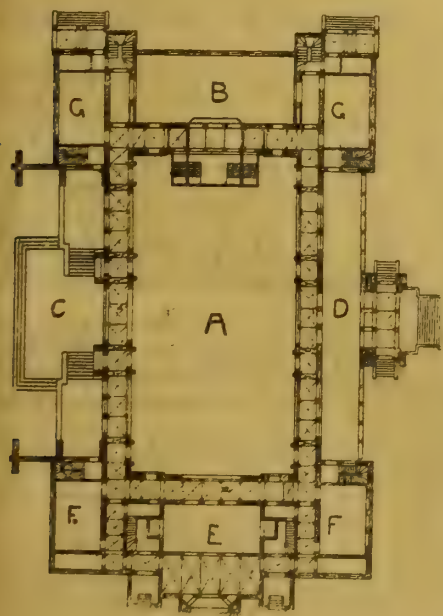


FIG. 7.—A, concert-hall; B, buffet; C, terrace entrance; D, covered corridor; E, vestibule; F, retiring-rooms; G, retiring rooms.

musicians and singers, at the rear of which is placed the great organ. The smaller of the two halls was constructed to meet the requirements of smaller concerts, quartettes, and chamber music. As the concerts are mostly held in the day-time, a good supply of daylight has been provided.

The plan which I produce shows the first-floor level upon which the concert-rooms are situated,



was very hard to make the ordinary tenant understand, and a man purchasing his holding at the time of his middle life did not much care whether the interest for its repayment ran for 60 or 70 years. It was now proposed that the annuity of 4 per cent., payable for the redemption of the purchase-money, should be reduced by not less than 10 per cent. at the end of each period of 10 years following the purchase, by making the charge 4 per cent. on the capital still outstanding at such period. This would reduce the annuity by about one-third at the end of thirty years. It was difficult to make tenants appreciate the benefit of concessions which were, to them, a long way off. They much preferred an immediate advantage, even if, in the end, they suffered by not waiting.

Mr. H. de F. Montgomery said he believed the authors of the present Bill were actuated by the best of motives; but he doubted whether the means by which they proposed to carry them out would fulfil the desired end. The respective and mutual rights of landlord and tenant were not sufficiently clearly defined. Then, as he read it, a tenant who was dissatisfied could have his case reheard, while a landlord had not that right. It also seemed that while the land stock was low the landlord might be paid off in it; but if it were above par, he must be paid in cash. In other ways the Bill certainly favoured the tenant, while infringing the landlord's rights. It had been suggested that rent should vary with prices, and he had himself tried to work out such a scheme; but he was faced by the difficulty that a man who bought and afterwards sold cattle, for instance, when they were cheap, made as much profit as if he bought and sold when they were dear. Many other details of the Bill were subject to criticism; but, on the whole, it was an honest attempt to deal with the question.

Mr. Horace Plunkett, M.P., said that from the landlord's point of view, every new Irish Land Bill was worse than the last; but he believed that if this Bill were accepted as a fair compromise, it would set the question at rest, at all events for a time. He thought the case of the newer landlords, who purchased under the Encumbered Estates Act, was even harder than that of the old landlords, for the former were assured, on purchasing, that they would benefit by a rise in rents, which the State afterwards made impossible.

Mr. H. Stuart Moore said he thought the Bill was rather a lawyers' one, and that members of that profession would be the only persons to benefit much by it. He did not think it held out any hope of finality.

Sir Thomas Butler having expressed his concurrence with the views of previous speakers, Mr. Sanders, in reply, said he attributed the failure of the Land Acts which had so often been passed, to the fact that they were political, and not agricultural acts. They had not promoted agriculture, nor induced capital to support it; they had only transferred property from one class to another. The future farmer would be a worse rack-rented man than his predecessors. Everything was ostensibly done for the tenant, but no facilities were given to the landlord. If he sold, his money must remain in court until he had gone through a very tedious process of proving his title, and was it likely that, such being the case, any landlord would willingly sell?

#### NOTES ON DOMESTIC DRAINAGE.—XIV.

##### HOUSEMAIDS' SLOP-SINKS.

FOR a small dwelling the simplest method of disposing of fouled chamber liquids is to arrange the sanitary fittings so that a water-closet—preferably one used by the servants—is available for this purpose. In such a case it is desirable that the combined closet and slop-sink should be of the wash-down pedestal form, and



FIG. 70.

fitted with a circular-fronted white-glazed earthenware slop-top under the hinged seat of the closet. Fig. 70 is a sketch of a slop-top suitable for this purpose. A housemaids' washing-up sink must also be provided in some convenient place. The sink may be of glazed stoneware or enamelled cast iron, supported on cast-iron

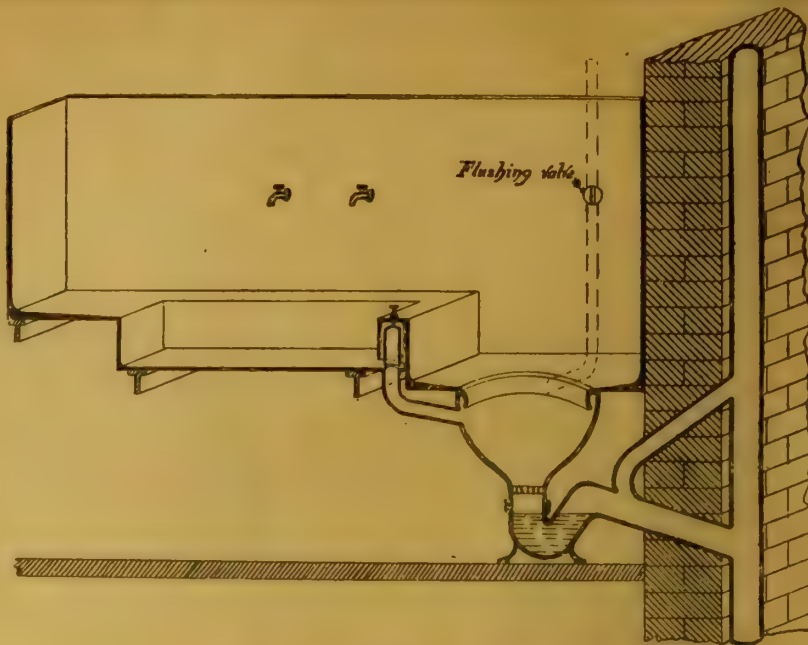


FIG. 72.

brackets, and the whole of the appliance, including the waste and overflow pipe, should be visible and readily accessible for cleaning purposes.

Instead of the usual brass washer and plug to the outlet of the waste and a concealed overflow pipe, it is desirable to provide a standing waste and overflow, which may be placed in a small open recess, as shown in Fig. 71. A siphon trap must be fixed immediately under the sink outlet, the waste-pipe discharging outside over the hopper head of a vertical waste, which should again discharge over a trapped gulley. Both hot and cold water supply are usually laid on to the sink.

In large establishments where separate slop-closets and sinks are necessary, the slop sink and wash-up sink may be combined, as shown in Fig. 72. The slop sink must be fixed under precisely the same conditions as required for a

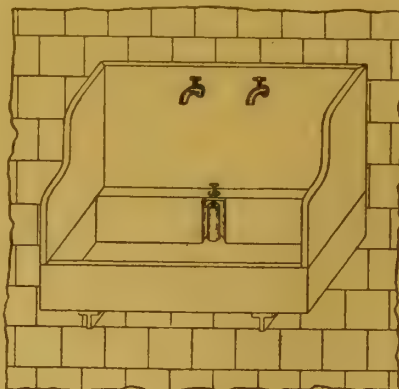


FIG. 71.

water-closet. The whole should be thoroughly self-cleansing, the basin being provided with a flushing-rim and small flushing-cistern or water-waste preventer. A loose grating should be fitted at the bottom of the basin, in order to retain pieces of soap, brushes, cloths, or other foreign articles which might at any time be carelessly thrown in with the slops.

The soil-pipe and trap to a slop-sink need not be larger than 2½ in. or 3 in. diameter. It must be connected to the drain, and carried up full bore above the eaves as a ventilating-pipe in the same way as described for the soil-pipe of a w.c. An anti-siphonage pipe should also be fixed near the top of the trap, as shown in Fig. 72. The wash-up sink should be provided with a standing waste and overflow pipe in an open recess at the open recess at the side, the waste-pipe therefrom discharging into the slop-sink just below the flushing rim.

Housemaids' slop-sinks should be fixed in well-lighted and ventilated lobbies, not in some dark inconvenient out-of-the-way corner as is so

frequently the case. The floor should be concrete, tiles, mosaic, or other similar materials, the portions of the walls contiguous to the slop-sink being protected with enamelled slate or glazed tiles to a height of at least 3 ft. The hot and cold water supply should not be placed over the slop-sink, as the water drawn from taps in such a position might possibly become fouled with splashing from the slops and also by dirty cloths being temporarily placed upon them. The water supply should be arranged to discharge over the wash-up sink, as shown in Fig. 72.

Both the slop-closet and the wash-up sink are best fixed without any wooden inclosure, so that every part may be visible and readily cleaned.

##### CHIPS.

To-day (Friday) the Lord Bishop of Exeter will lay the foundation stone of the new Church of All Saints in the Exeter-road, Exmouth, of which Messrs. Luscombe and Son, Exeter, are the builders.

The church of St. George, at Tiverton, is about to be restored internally and "given a more ecclesiastical appearance," under the direction of Messrs. Tait and Harvey, of Exeter. The estimated cost is £700.

The foundation-stone of the new town hall for Hammersmith was laid on Wednesday week by the Duke of Fife. The building, to be erected by Messrs. G. Wimpey and Co., from designs by Mr. John H. Richardson, will abut on to the Hammersmith Broadway, replacing the recently demolished building occupied by the Vestry of Hammersmith, in succession to the defunct Fulham District Board of Works.

The new house property in Hove and Aldrington is filling up rapidly, and more is in course of erection. The open space between the Hove Gasworks and Connaught-road is being covered with shop property. On the opposite side of Church-road shops are being built between the Hove council yard and Hove-street. A new road will shortly be made to the north of the railway, forming a continuation of Rutland-road, up to the Old Shoreham-road. Portland-road is being extended further west, and house property is being built close to the National Schools, which but a few months ago stood quite alone. At the bottom of Station-road, Aldrington, and in the Hove parish, shop property is being erected, while the new roads to the west of Westbourne-villas are being rapidly covered with modern villa residences.

The district council of Ilkley have taken over from trustees the building and contents of the local museum.

Mr. F. H. Tulloch, Inspector of the Local Government Board, held an inquiry at Peterborough on Wednesday week with regard to the application of the city council for sanction to borrow £20,000 for electric-lighting works.

The school board for Coventry have adopted plans by Mr. George Steane, of that city, for enlargement of the schools in South-street, from 750 to 1196 places, at an estimated cost for the additional 446 seats of £3,100.



## CONTENTS.

Custom v. Common Sense .....	697
Pictures at the Royal Academy.—III. ....	697
Architectural Association .....	699
Designing of Steel Bridges, Theoretical and Practical.—XIX. ....	702
The Timbers of Australasia.—VI. ....	703
County Lunatic Asylums.—XLIV. ....	705
Concert-Halls and Assembly-Rooms.—XVI. ....	705
The Surveyors' Institution .....	707
Notes on Domestic Drainage.—XIV. ....	708
Our Illustrations .....	709
The Building News Directory .....	IX.
Building Intelligence .....	728
Engineering Notes .....	728
Doulton's Patent Valve (Closets) .....	729
Obituary .....	729
Architectural and Archaeological Societies .....	729
Competitions .....	730
Correspondence .....	730
Legal .....	731
Legal Intelligence .....	731
Parliamentary Notes .....	732
Our Office Table .....	733
Meetings for the Ensuing Week .....	733
Trade News .....	734
Tenders .....	734

## ILLUSTRATIONS.

THE RATHHAUS, LUBECK.—INTERIOR OF ROYAL INSURANCE COMPANY'S NEW OFFICES, LIVERPOOL.—A HOUSE IN NORFOLK, BY MESSRS. ERNEST GEORGE AND YEATES.—BIRMINGHAM ARCHITECTURAL ASSOCIATION.—STABLES AT SHOCKERWICK, SOMERSET.—STEWARD'S HOUSE AND STABLES, NORFOLK, BY MESSRS. ERNEST GEORGE AND YEATES.—ABINGDON FREE LIBRARY.—COACH-LANE SCHOOLS, NORTH SHIELDS.

## Our Illustrations.

## AN OUTSIDE STAIRCASE OF THE RATHHAUS, LUBECK.

LUBECK, in North Germany, is a very interesting city, in virtue of its fine churches, its picturesque gateways, its treasures of painting and wood-carving, and its old buildings. In the 14th and 15th centuries Lübeck was the most important of the three independent towns of the Hanseatic League. It began to decline in prosperity early in the 16th century. It was pillaged by the French in 1806, and in 1810 Napoleon annexed it to the French Empire. In 1815 it was declared a free town of the German confederation. About that time its population had dwindled from 80,000 to 23,000; now it has recovered some of its former importance, and the population is about 70,000. In old days Lübeck was walled and fortified; of these fortifications little more remains than the two fine gateways, the Berg Thor and the Holsten Thor, both of the 15th century. The Rathaus is one of the most remarkable buildings of Lübeck. (We give an illustration of an outside staircase from drawings by Thomas R. Macquoid, R.L., who kindly sends us this description.) A portion of the building dates from the end of the 13th century: it forms a part of two sides of the Market-place. The old portions are faced with glazed brick, red, green, and black. Some Renaissance work was added in the 16th century, of which the outside staircase, with a beautiful balcony near it, is a notable feature; it is in the Breite Strasse. This staircase leads to the first floor; it is of plaster, and its carvings are elaborate, delicate, and full of character. An interior staircase, also of 16th-century date, is remarkable; it is supported by clustered columns. When I saw it, it was lighted by electric light, which gave great effect to the green glazed bricks of which it is built. There are fine oak carvings and beautiful interior work in the War Chamber of the Rathaus. T. R. M.

## THE ROYAL INSURANCE OFFICE, LIVERPOOL.

THE week before last we gave illustrations of the selected design for this great building in Liverpool, as well as Mr. John Belcher's design for the same work, and both are being exhibited at the present Royal Academy. To-day we supplement the exterior of Mr. Belcher's design by giving his perspective of the interior of the public office, which in point of fact forms the leading feature of his scheme. It is a bold venture ably handled, and well worthy of the artistically-drawn view by which it is so well illustrated at Burlington House, and herewith reproduced.

## HOUSE IN NORFOLK.

THIS East Anglian mansion, from the designs of Messrs. Ernest George and Yeates, is represented by the two perspective views which are now at

the Royal Academy Exhibition, from the masterly pencil of Mr. Ernest George. The key plan which accompanies these drawings shows the quadrangular forecourt in front of the house, the kitchen yard being well screened within an inner court. The main block follows the E shape that was common to Elizabethan houses, the office wing forming a quadrangle on the north side.

## SKETCHES BY MEMBERS OF THE BIRMINGHAM A.A.

A FEW weeks ago we published\* some drawings made to time by the members of the Sketching Class of the Birmingham A.A. To-day we give two more by Mr. Herbert Norman, who can give no particulars of the half-timbered house; but he kindly sends us the following notes about Hampton-in-Arden Church, the subject of the upper drawing on the accompanying lithographic plate. When we referred to the work of this club before, as above stated, some account of the method of working adopted was furnished which may be interesting for reference. Hampton-in-Arden Church is a veritable Tom-Tiddler's ground for the architectural student—all phases of architecture, from Norman to Perpendicular, are here to be met with. The sketch given shows the junction of chancel and south aisle, the window in the latter being to a small chapel. In the chancel, which is somewhat narrow, being only 17ft. wide, there is a rather ornamental reliquary, also a sedilia and piscina. In the north wall is to be found a Norman doorway, with traces of carving still remaining in the tympanum. The tower itself is of most pleasing proportion.

## STABLES, SHOCKERWICK, SOMERSET, AND STABLE BUILDINGS AND STEWARD'S HOUSE IN NORFOLK.

THESE two similar groups of stable buildings are situate in far distant parts of the country—the first work designed in stone, the second in half-timber construction—and although so different in treatment, both display an entirely appreciative taste and suitability of purpose at once in harmony with the best traditions of our national Domestic architecture, and well according with their surroundings, besides which they meet the practical requirements of to-day, for which they are intended. Messrs. Ernest George and Yeates are the architects.

## ABINGDON FREE LIBRARY.

THESE premises have been erected from the designs of Mr. J. G. T. West, architect. The front elevation is in red brick, relieved by stone dressings and timbered gabled bay windows on the second floor, with a pair of French doors and a balcony over the central entrance, surmounted by a stone canopy, in which is the key-stone laid in June last by Lord Wantage, bearing the letters C. H. in monogram form, and the date 1895. The front part of the ground floor is occupied by two shops with separate entrances, and the rents of these business premises will be reserved by the Governors of Christ's Hospital in consideration of their having spent more than their scheme allows. Here it may be said that the remainder of the building has been handed over to the Corporation free of rent, and that body some time ago made a grant to Christ's Hospital of £250. The Council has also agreed to maintain the institution. There is a separate central entrance to the library, leading through a corridor to the central hall, in the rear of which is the news-room, where stand accommodation is provided for twenty daily and weekly newspapers. This part of the building is of one story, with glass roof, and is fitted, as are other parts of the building, with incandescent gas-lamps. Adjoining the central hall on the west side is the lending library, affording space for some five thousand volumes. On the second floor, above the shops and central corridor, is a well-lighted apartment, 38ft. by 20ft., fitted up for the reference library. The coats of arms decorating this room are illuminated upon stone corbels, in the form of shields, and are those of Christ's Hospital, the Borough of Abingdon, the Abbey of Abingdon, Sir John Mason, John Roysse, Sir John Golafre, Tesdale, and Richard Curtain. There is a third floor above this, comprising apartments for the librarian and caretaker. The whole building is heated by hot water, and fitted with ventilation and sanitary arrangements.

## SELECTED DESIGN FOR COACH-LANE SCHOOLS, NORTH SHIELDS.

THIS drawing illustrates the selected design in the recent competition for the Coach-lane Schools,

for the Tynemouth School Board. The competition was restricted to local architects. The assessor appointed to adjudicate was Mr. E. R. Robson, F.S.A., architect to the Educational Department, London, whose report was adopted. The schools, with large central hall, have ten classrooms opening off, providing accommodation for 1,250 children on the ground and first floor. The second floor is arranged as a pupil teachers' central teaching school, with cookery, chemistry, and art rooms in addition. There is also a large examination hall. The architects are Messrs. Marshall and Dick, of Newcastle and North Shields.

## CHIPS.

At the London Sheriff's Court, on Tuesday week, the claim of Messrs. M. and S. Lyons, silversmiths, High Holborn, for £11,087, as compensation for the taking over of their premises by the Central London Railway Company as a site for a station, was considered by Mr. Under-Sheriff Burchell and a special jury. The jury returned a verdict for £3,100.

The bells in the lantern tower of Durham Cathedral, which have been silent for some time, owing to the unstable condition of the framework, are being rehung in fresh frames of oak.

The foundation-stone of a new Roman Catholic church, dedicated to St. Joseph, was laid last week in the Gordon-road, New Normanton, near Derby. St. Joseph's was built in 1876 as a school chapel, but is quite inadequate, and in the future will be utilised as schools. The new edifice, which adjoins, will be of brick with stone dressings, and will cost £3,000. The architect is Mr. J. Hart, of Corby, and the contractor Mr. Clark, of Nottingham.

The Dean of Winchester has received from an anonymous donor £1,000 for the repair of the roof of Winchester Cathedral. The fund now amounts to close on £7,000. It is now proposed to carry out important work in connection with the great screen and the Lady chapel, and to fill the windows of the latter with stained glass.

The Deputy Mayor of Southport on Saturday received a memorial, bearing 2,030 signatures, asking the town council to do all in its power to further the erection of workmen's dwellings, the lack of which in Southport and Birkdale was the cause of families having to dwell two, three, and even four in a house.

In rescuing a lad named Pow, who had got beyond his depth whilst bathing in the Taw from Anchor Wood, Barnstaple, Mr. George Hancock, aged 24, eldest son of Mr. Hancock, builder and contractor, of Pilton, was himself drowned on Friday.

The first section of a new church of St. Augustine is in course of erection at Preston Park, Brighton, from plans by Mr. Granville Streetfield, and will be opened in October. It consists of the nave and aisles, and will cost about £7,000, a further £10,000 being needed for the completion of the undertaking.

Mr. Santo Crimp, of the firm of Taylor, Sons, and Santo Crimp, Great George-street, Westminster, civil engineers, who had been appointed to advise the town council of Rugeley on the 14 sewerage schemes and plans submitted to them in competition, visited the town and inspected the schemes last week.

Mr. W. J. Steele, assistant borough engineer of West Hartlepool, has been appointed chief assistant to the surveyor and water engineer of the Tottenham Urban District Council.

A large block of business premises has been built at the corner of Mount Ephraim and Calverly roads at Tunbridge Wells. The building is three stories in height, and contains thirteen shop fronts. Mr. Grover, of Tunbridge Wells, was the contractor.

Christ Church, Tunstall, was reopened for Divine service on Thursday evening in last week, after having undergone thorough renovation both as regards the fabric and the internal decoration. The latter work has been carried out by Mr. G. Earp from designs by Mr. Dain.

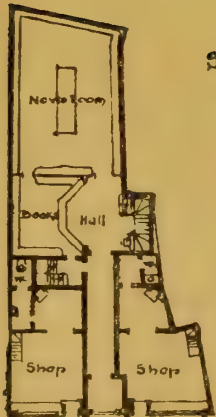
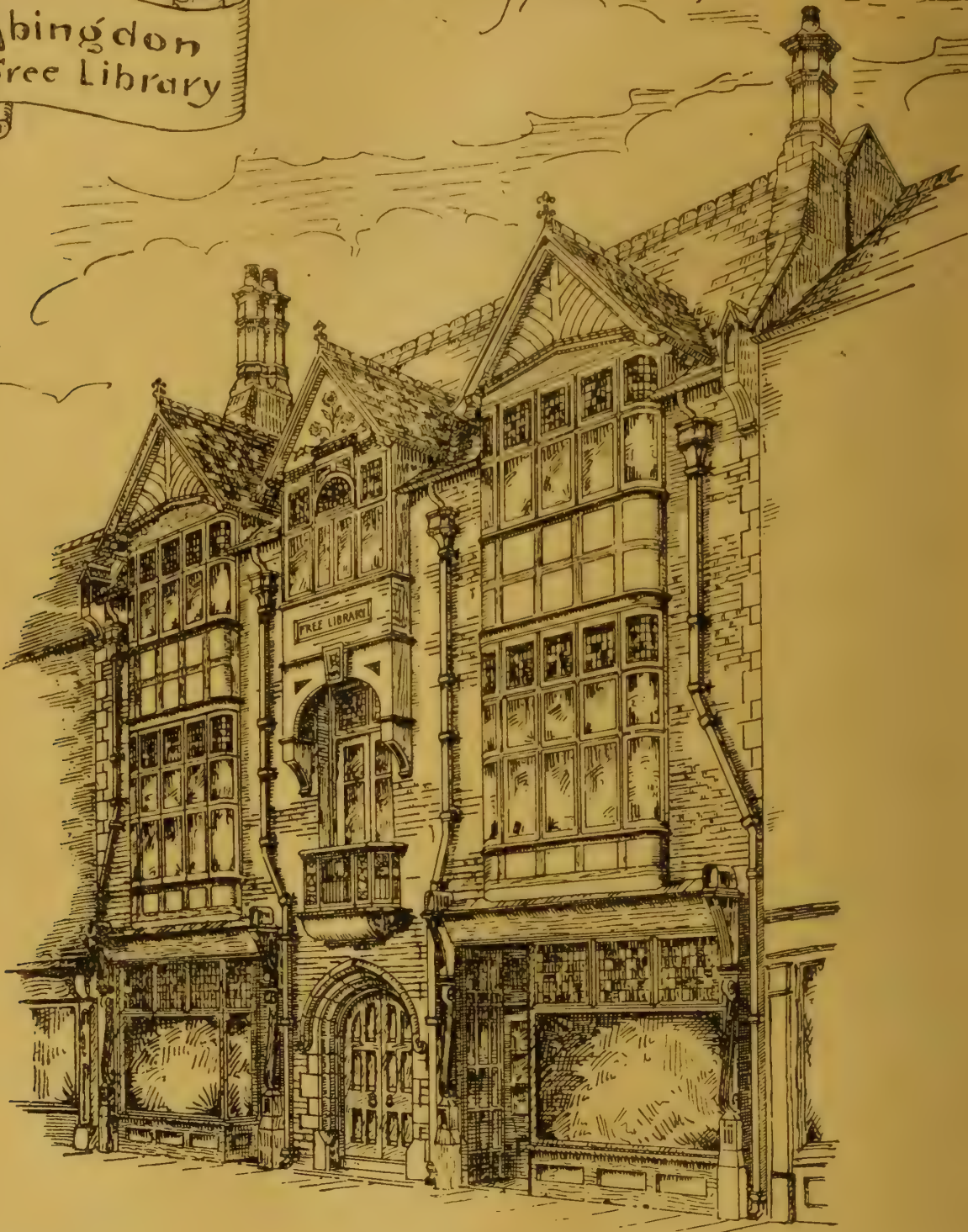
On Tuesday week an inquiry was held at the town hall, Newcastle-under-Lyme, by Col. W. Langton Coke, M.C.E., an inspector of the Local Government Board, into an application by the corporation for sanction to a loan of £2,420 for gas purposes.

At the last meeting of the Glossop Town Council it was reported that six of the contracts for the sewerage scheme had been let to Mr. George Bell, of Manchester and London.

The Islington Guardians have agreed to purchase from the Metropolitan Asylums Board the smallpox hospital at Highgate Hill for £52,500. The hospital, which stands on nine acres of ground, is to be converted into an infirmary.

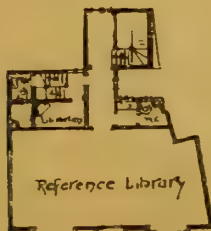
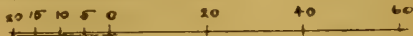


Abingdon  
Free Library

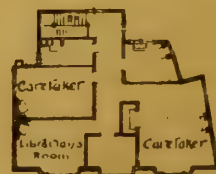


Ground Floor Plan.

Scale of Feet, for Plans.



First Floor Plan



Second Floor Plan

Mr Geo T West  
Mr. S.A.  
Abingdon











May 15, 1896.

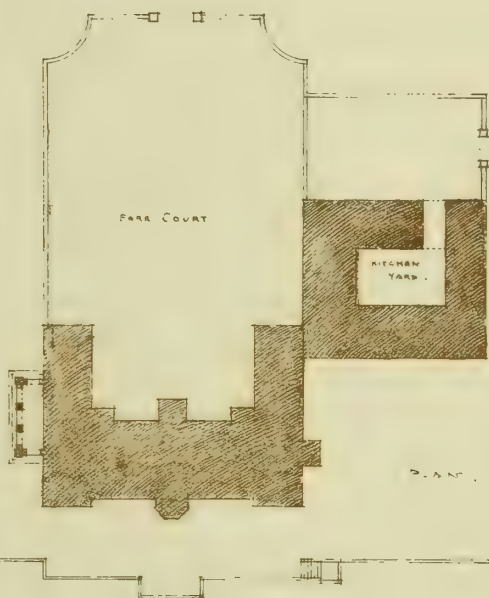
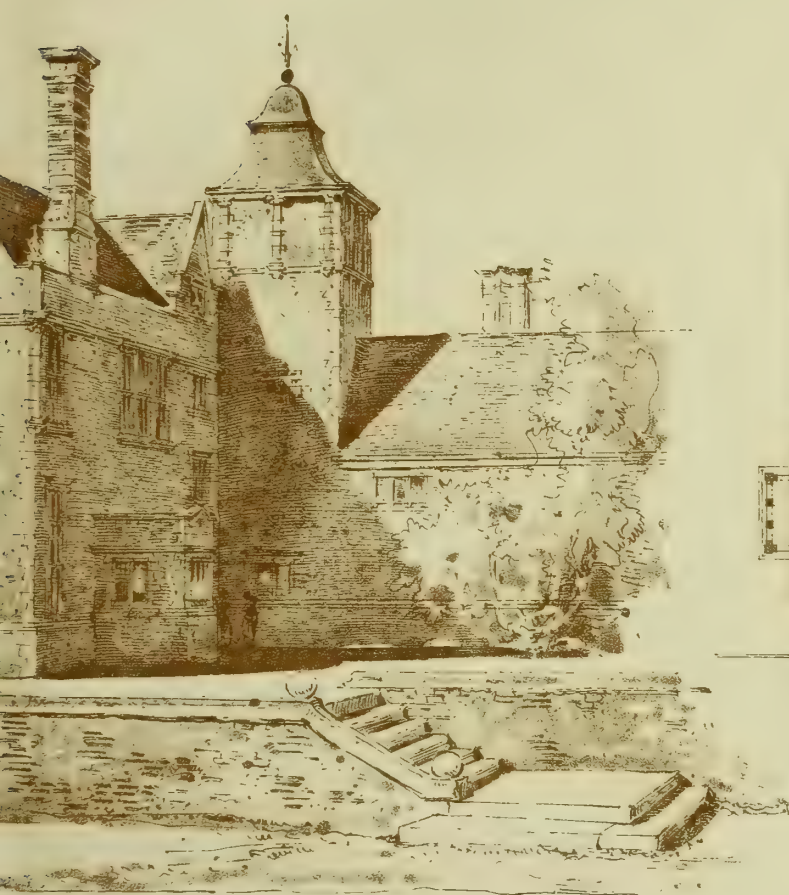
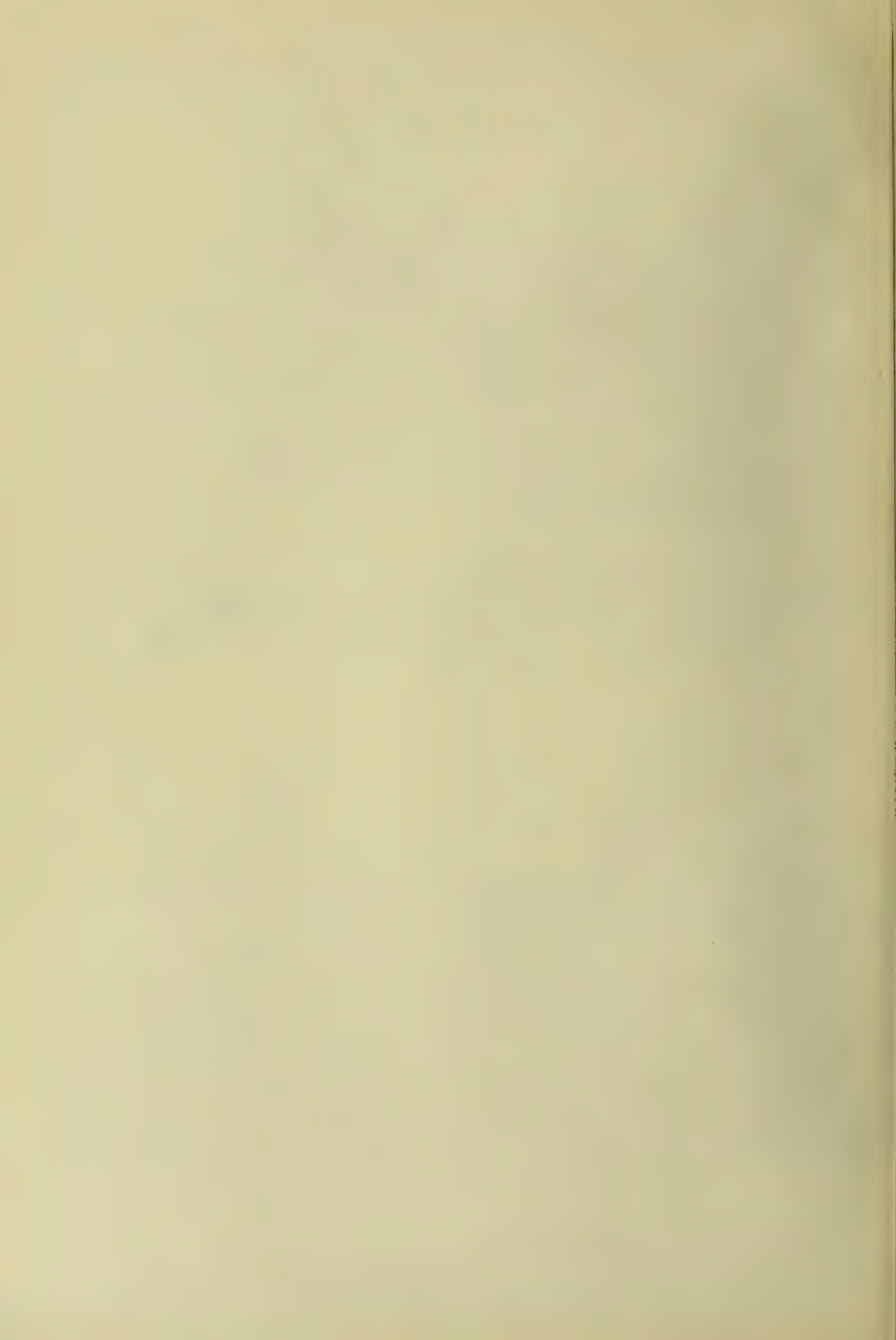


PHOTO TINT by James Akerman, 25 Queen's Square, London, W.



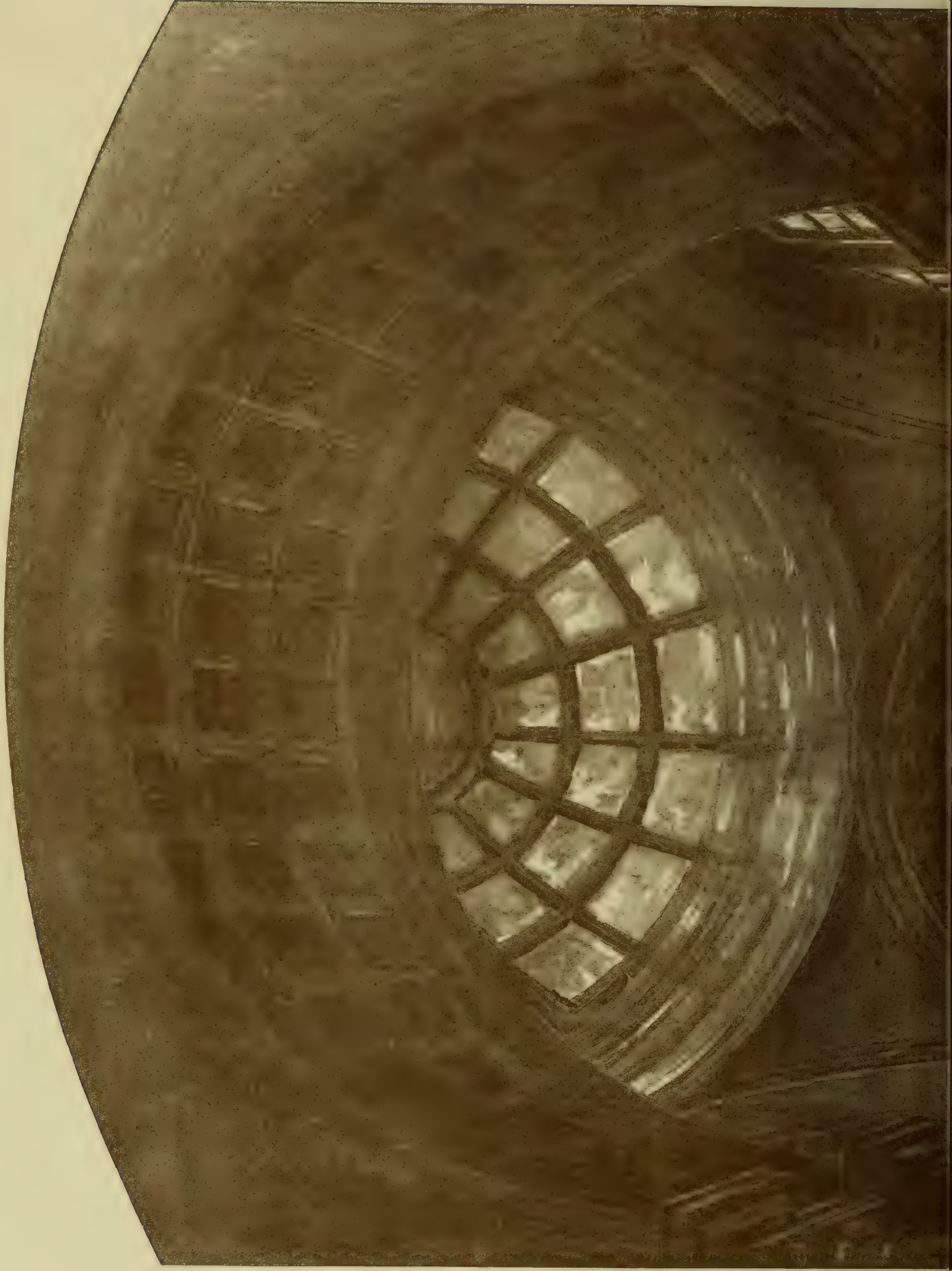




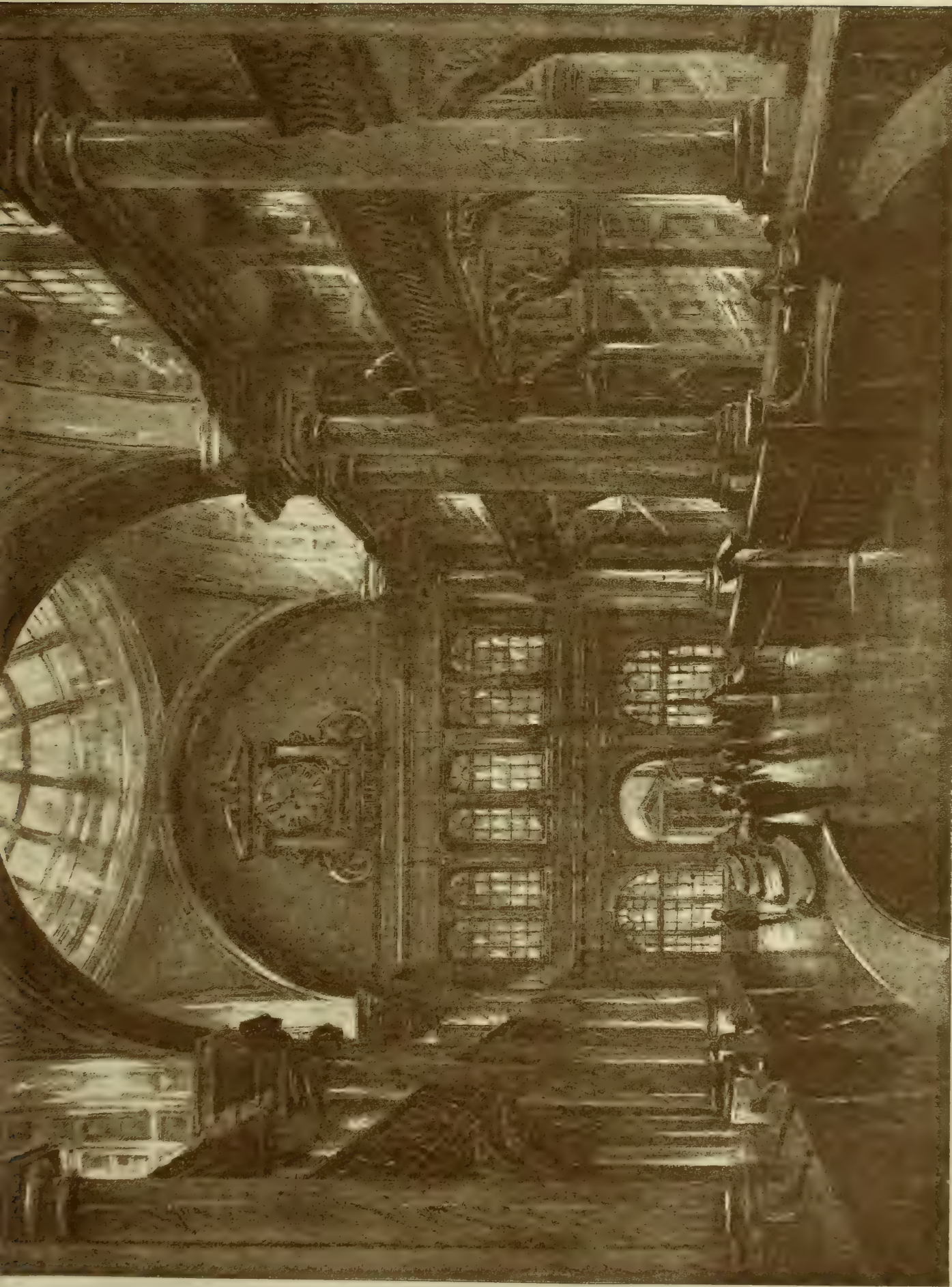




THE BUILDING PEWS, MAY. 15, 1896.





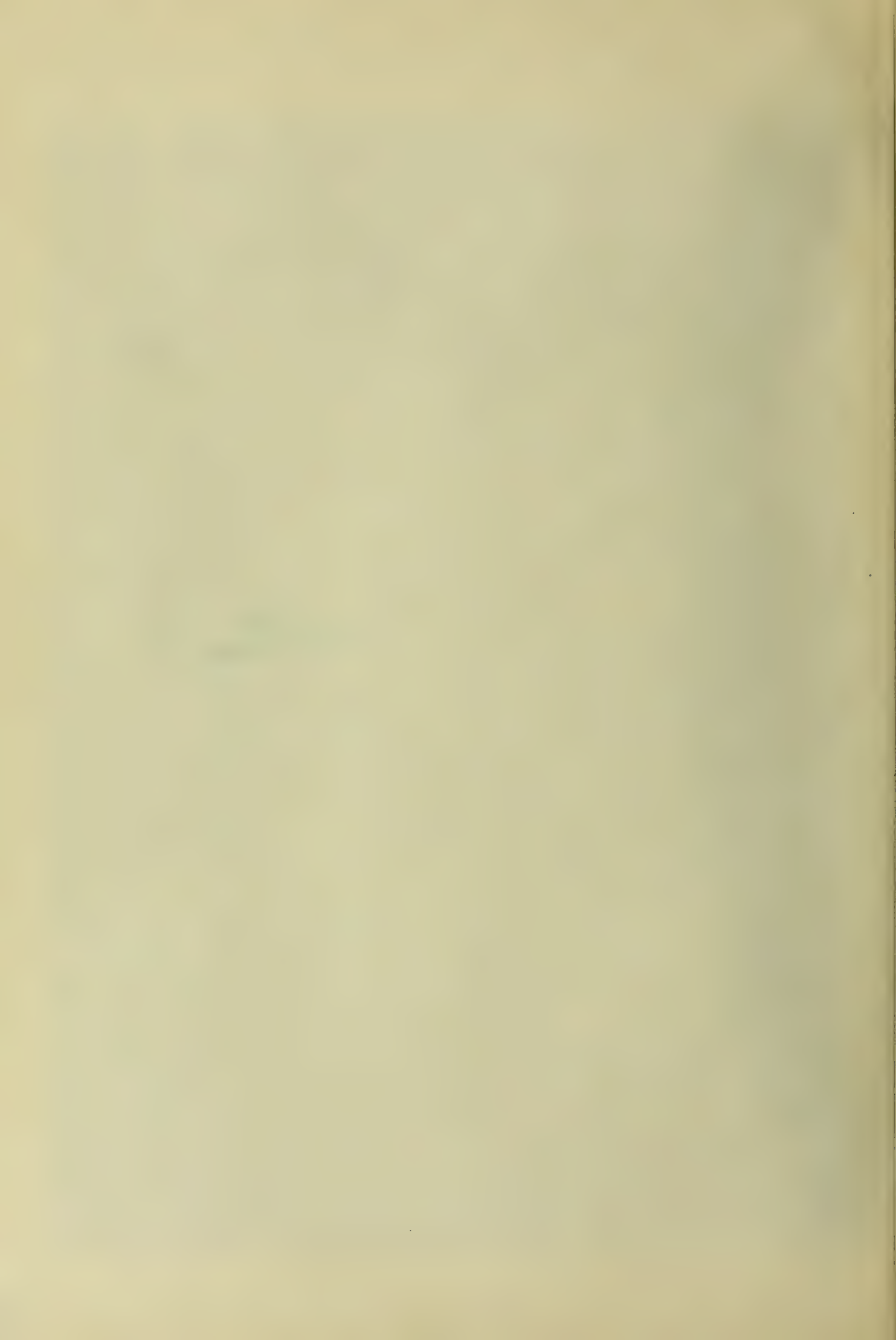


INTERIOR VIEW

ROYAL INSURANCE BUILDINGS · LIVERPOOL · COMPETITION

PHOTO-LINT. BY THE ARCHITECT · GREEN SQUARE LONDON W.C.

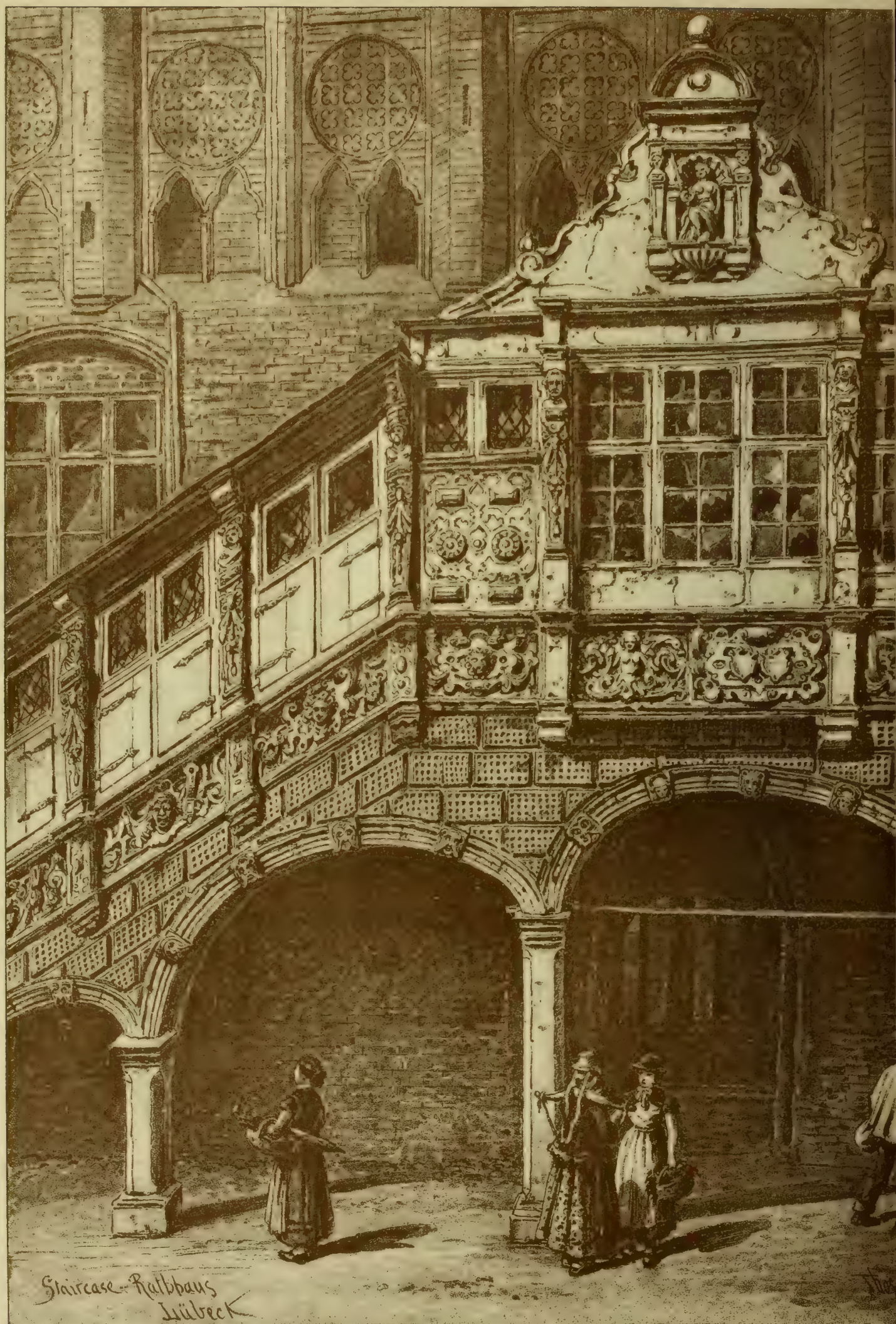










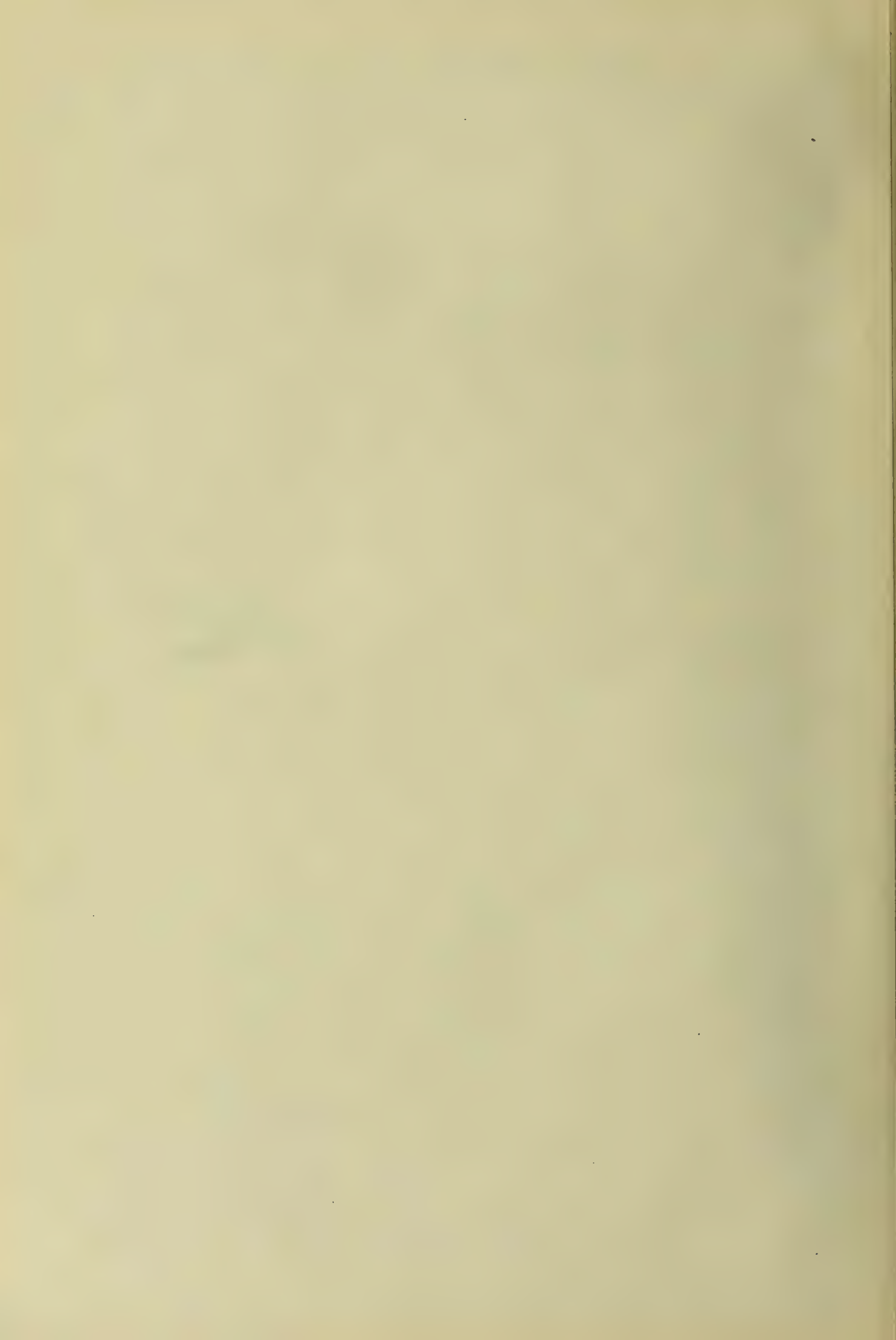


STAIRCASE TO RATHAUS · LUBECK · BY · T·R· MACQUOID · R·I·

















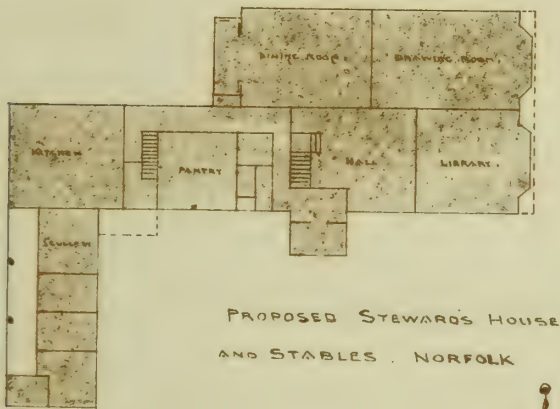
STABLE BUILDINGS  
SHACKERWICK, SOMERSET.

ERNEST GEORGE



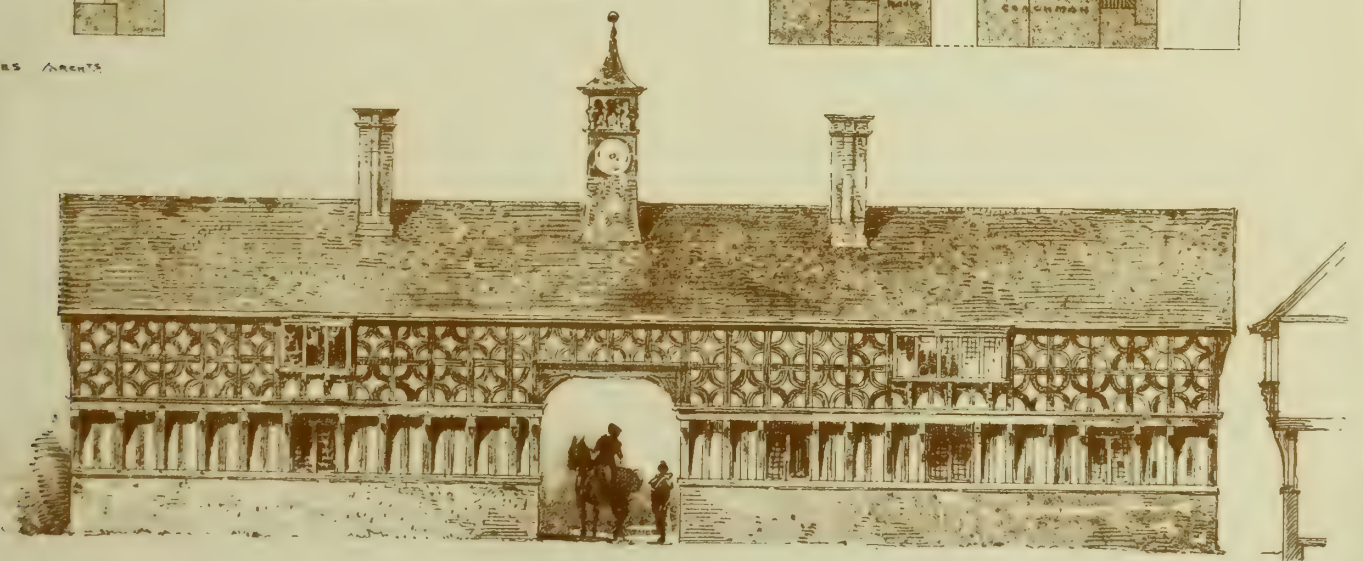


1896. MAY 15, 1896.



PROPOSED STEWARD'S HOUSE  
AND STABLES, NORFOLK

EATON & ALBERT





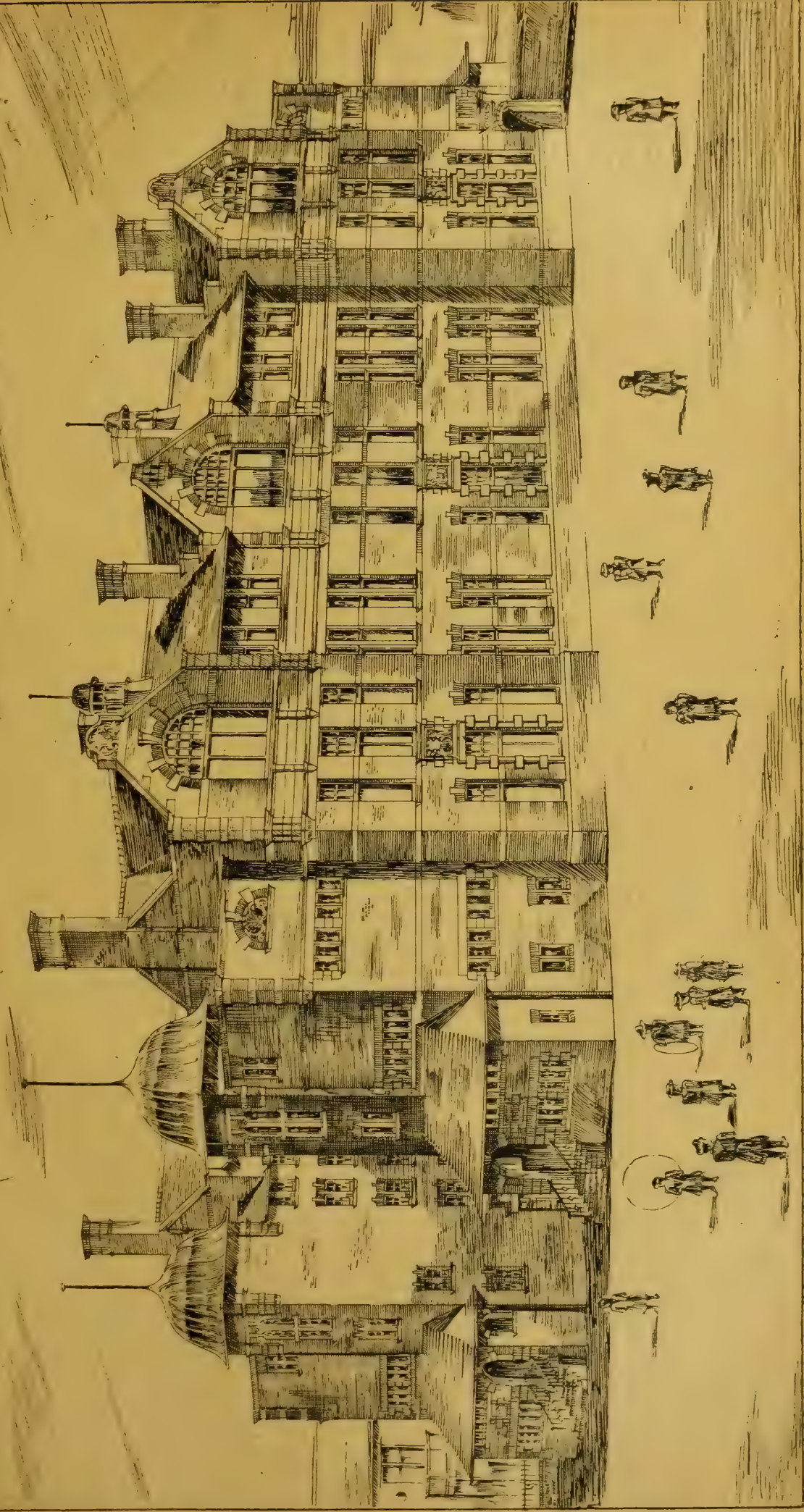




SPECIAL DESIGN FOR COACH LANE SCHOOLS

NORTH SHIELDS

MESSES MARSHALL & DICK ARCHT





## Building Intelligence.

**BIRMINGHAM.**—The Hen and Chickens Hotel, one of the oldest and most famous Birmingham hostleries, was recently pulled down, and on the greater part of the site the new high school for girls is now rapidly approaching completion. A portion of the site, 48ft. of the frontage out of 78ft., from the boys' school to Lloyds' Branch Bank, and 50ft. in depth, has been let on lease for the erection thereon of a temperance hotel and café. The designs have been prepared by Mr. J. A. Chatwin, of Birmingham, the architect of King Edward's High School for Girls, and provide for a building that will harmonise with the last-named structure, a portion of which will be visible from New-street through an opening 30ft. in width between the hotel and the boys' high school. The elevation will be of red terracotta with granite dressings on the ground-floor frontage, in the modern Renaissance style, and consists of five stories and a mansard. At the corner there is an octagonal turret terminating in a short spire, while the façade is broken by oriel windows terminating in a gable in front of the high-pitched roof. Upon the ground floor there will be a central entrance to the hotel, and right and left of this two shops. From the hotel entrance a spacious staircase leads down to a basement, with rooms for café purposes, and a second granite staircase will rise to the upper rooms, a lift being arranged in the well-hole. Upon the first floor will be a commercial-room, drawing-room, coffee-room, smoke-room, and serving-room. Above these the second, third, and fourth floors and the mansard will be appropriated to bedrooms, numbering 52 in all. The building will be fireproof, and the cost of erection will be £10,000.

**LEEDS.**—Two new operating theatres are now in course of erection at the General Infirmary, from plans by Mr. William H. Thorp, F.R.I.B.A., of Albion-street, Leeds, the architect of the new medical department of the Yorkshire College. The new department occupies a central position abutting upon two interior courtyards, and presents, therefore, no scope for architectural effect. The external walls are faced with pressed brick, with Wrose Hill stone dressings, and the operating theatres are to be roofed with dark green Westmoreland slates. There is a new central vestibule in the form of an elongated octagon, around which the various rooms are grouped. These include two operating theatres, each 23ft. 6in. by 19ft. 6in., with an instrument-room, 16ft. by 14ft. 3in., adjoining and opening out of each; two anaesthetic-rooms, each 15ft. 10in. by 12ft.; two waiting-rooms, 14ft. 3in. by 12ft.; a surgeon's room, 10ft. 6in. by 9ft. 5in.; and a recovery room of similar size. The theatres are each 18ft. in height, the floors and roofs being of fireproof construction, composed of steel joists and Fawcett's tubular lintels, and slag and coke-breeze cement concrete. The roofs are rectangular on plan and domical in construction. The floors will be finished with marble terrazzo, and the ceilings with Parian cement. The walls throughout will be lined with opaline, a vitreous material with a smooth, glassy face, which has not been used for wall linings in this country before. It is  $\frac{3}{4}$ in. in thickness; the slabs are about 5ft. by 3ft. square, and all angles are rounded. Galleries of skeleton iron construction, with teak treads and seat rests on either side of the theatres, give accommodation for 56 students in each room respectively. In addition to extra large-sized windows between the two galleries, top-lighting is obtained from the roofs. The entrance-hall, the recovery room, and surgeons' room are top-lighted with domed lantern lights, and the former is provided with a high dado of glazed tiles. All doors and the window frames throughout the department will be carried out in polished teak. The cost, including fittings, will be £4,000.

**ST. ALBAN'S.**—Now that he has completed his work at the cathedral and in rebuilding St. Peter's Church, Lord Grimthorpe has turned his attention to St. Michael's parish church, the tower of which is admittedly in a threatening state. At a vestry meeting held in the city last week a resolution was passed stating: "That in the opinion of this vestry the tower of St. Michael's is in a dangerous condition, and needs immediate attention." Lord Grimthorpe, who is now adding a vestry to the structure, offered—at his own sole cost—to take down the tower so far as shall be found necessary, and to build a new one

generally similar to the present but rather larger and having one more story, so that the bottom one may be a porch at the west of the northern aisle, with a belfry above it, and a small intervening room between that and the bell chamber. The west painted window will be replaced in the same position, and the nave roof will be continued up to a new low west gable. The nave will not otherwise be touched except as may be necessary to unite it with the tower. All the new outside work will be done in the same way as the new vestry, the walls to be either of brick or sound rubble cement with stone quoins, and the walls to be rehung. In reply to questions by the Earl of Verulam and others, as to the appearance of the restored structure, Lord Grimthorpe said if the parishioners did not choose to accept his terms they would not get anything. He would not pledge himself any further. Upon this the following resolution was unanimously agreed to, upon the motion of Lord Verulam and Mr. Bayne: "That having heard the explanation of Lord Grimthorpe and his plan of rebuilding the tower, the vestry resolves to place the work in his hands."

**ST. HELEN'S, LANCs.**—The Library and Gamble Technical Institute in Hardshaw and Corporation-streets is now both externally and internally in an advanced stage of erection, and will be opened in August next. Messrs. R. Neill and Sons, of Manchester, are the contractors, and Mr. Goulbourne is the clerk of works, the architects being Messrs. Briggs and Wolstenholme, of Blackburn. The basement, which is to be used for the mechanical classes, plumbing, engineering, and so forth, affords all the space necessary for the departments, while the ground floor, on which the principal rooms are nearly complete, will be used for the library, including news-room, 114ft. by 32ft.; reference library, 52ft. by 32ft.; lending department, and reading-rooms. The physics laboratory and lecture-room, the latter seating about sixty, and the chemical laboratories and lecture-rooms are all well on towards completion. The laundry is paved with granolithic sin. thick, lit in the daytime by ten large windows, and at night by electric-lights. The art room is on the second floor, and also the elementary art room, 47ft. by 32ft., with modelling-rooms, &c. We illustrated the building in our issue of August 31, 1894.

**WALWORTH.**—Richmond-street Mission, Walworth, S.E., in one of the poorest districts of Walworth, was founded in 1858. It has entirely outgrown the accommodation of the present building, and a larger hall was imperative. The committee acquired the adjoining land, and accepted the design submitted in competition by Mr. George Baines, F.R.I.B.A., 4, Great Winchester-street, E.C., for a new building, the foundation stone of which was laid on Saturday. The new hall is 53ft. long by 33ft. wide, with two entrance lobbies and staircase leading to a gallery. In addition to these there are four classrooms and a kitchen. The whole is surmounted by an open-timber roof. The main front is towards East-street, and has two bold pointed headed doorways moulded in stone, flanked on either side by pilasters. The contract is let to Mr. T. D. Leng, builder, Deptford, for £1,690, and the building has to be completed Nov. 11, 1896.

The construction of the North Sunderland Railway is to be proceeded with as soon as possible. The ceremony of cutting the first sod took place yesterday (Thursday) afternoon.

The foundation-stone of the new buildings for Richmond-street mission and schools was laid in East-street, Walworth, by the Duchess of Roxburghe on Friday. The schools are being built at a cost of £1,600, from plans by Mr. George Baines, M.S.A., of Great Winchester-street, E.C.

The aggregate of the transactions at the Auction Mart last week amounted to £91,564, principally obtained from the usual run of small investments, varied by sales of a West-end residence and a few small residential properties.

The fight for the water-gathering grounds between the Corporations of Sheffield and Barnsley has ended in an amicable arrangement. In addition to these two places, Rotherham and Doncaster are also concerned. The estimated net yield of the valley in dispute is 8,500,000 gallons per day. By the agreement come to on Friday, before the House of Commons Committee, which was considering the Sheffield and Barnsley Water Bills, Barnsley and Rotherham take 1,600,000 gallons each, and Doncaster 1,000,000, leaving for Sheffield 4,300,000.

## Engineering Notes.

**COLCHESTER.**—The Great Eastern Railway has just opened a new station at Colchester. The new buildings comprise a spacious booking-hall, a refreshment-room, four waiting-rooms, an office for the station-master, parcels office, a telegraph office, &c., the whole being constructed of red brick, with Box stone dressings. The station premises, properly so-called, are 310ft. in length, but platform space, with covered way, has been provided for 700ft. The demolition of the old station has been commenced. The new station was erected by Messrs. Bateman and Co., of Ramsey, Huntingdonshire, from designs furnished by Mr. Wilson, chief engineer to the Great Eastern. The ironwork, which formed the subject of a separate contract, was supplied by Messrs. Handyside and Henderson, of Derby.

**PROPOSED MILLWALL AND GREENWICH TUNNEL.**—The Bridges Committee of the London County Council have prepared a scheme for the construction of a foot-passenger tunnel under the Thames to connect Millwall with Greenwich. It is intended that the tunnel shall be for foot-passenger traffic only, having a footway of 8ft., with a headway of 9ft. 4 $\frac{1}{2}$ in. in the centre reduced to a minimum of 7ft. 6in. at the outsides. The cast-iron tubing would be lined inside with concrete faced with glazed tiles, and the tunnel would be lighted by electricity. The shafts on either side of the river would be 32ft. 8in. internal finished diameter, and a spiral staircase 6ft. wide would be constructed, 20ft. clear diameter being left in the middle, in which hydraulic lifts might be constructed at some future date, should necessity arise. The height of the stairway would be 43ft. 6in. on the north and 51ft. on the south side of the river. The soundings and dredgings which the Council have made are said to show that under compressed air there is no danger or difficulty to be apprehended in the construction of the tunnel proposed. The total estimated cost of the works amounts to £65,000. The land required would cost £5,500, making a total for land and works of £70,500. In addition to that, £25,000 would have to be paid as compensation to persons interested in the existing ferry and ferry rights. The capital cost of the tunnel, including compensation for the ferry rights—viz., £95,500—has been reduced to an annual sum, and amounts to about £4,190 per annum for the first year, diminishing each year till the debt is paid off in 53 years. The committee ask the Council to seek Parliamentary powers to carry out this scheme. The report will be considered by the Council at next Tuesday's meeting.

**FLOODS PREVENTION AT BRISTOL.**—The City Council of Bristol considered, on Tuesday, a report by the Floods Committee, which recommended, on the advice of Mr. T. Yabbicom, city engineer, and Mr. McCurrich, docks engineer, an expenditure approaching £100,000 for measures for preventing flooding from the river From and the Boiling Wells and Cutler's Mills brooks, and for dealing with the flood water when it has found its way into the Floating Harbour. The committee's proposals were as follows:—Cutler's Mills Brook relief culvert, £21,000; Boiling Wells—reservoir and culvert, and purchase of Old Mill, £25,000; dealing with From floods—pumping stations, &c., £28,000; renewals and maintenance, £7,000; deepening course of From and improving culverts, £16,000; a total of £97,000. The proposals received the support of the large majority of the councillors; indeed, so far as the relief culverts for the Cutler's Mills and Boiling Wells stream were concerned there did not appear to be any opposition; but in connection with the From floods, several members dissented from the report, because it fell short of the recommendations of the docks engineer, who had reported upon the advisability of making a reservoir near Stapleton Bridge, at an estimated cost of £45,000, as an additional preventive measure. The amendment to refer back the second part of the report was defeated by 41 votes to 6, and the report was afterwards adopted in its entirety.

All Saints' Church, Laughton, endowed in 1310 by John Dalbery, then Bishop of Lincoln, has just been restored, and the opening ceremony took place on Friday. The work has been carried out from the designs and under the superintendence of Messrs. Bodley and Garner, of Gray's Inn. The contractor was Mr. Franklin, of Dodington.



## DOULTON'S PATENT VALVE CLOSETS.

AMONGST the many forms of closets there are few which combine the advantages of both valve and "wash-down" types. Messrs. Doulton and Co. have introduced a new form, being an improved pedestal closet on the valve principle, possessing the advantage of retaining a large body of water. It is entirely of ware, both basin and trap. The "Simplicitas" valve-closet is the name given to this capital arrangement. Instead of the drawback to which most valve-closets are exposed of there being no water in case of a leakage, in the "Simplicitas Valve" there is a large body of water retained in the basin, even should the valve be kept open, so that a dry pan is an impossibility under any circumstances. The closet is flushed by an ordinary waste preventer, constructed on the siphonic principle, and by pulling a chain the siphon keeps open the discharge valve till the whole contents of the tank have passed through the trap. The pull of the chain may be momentary. The section which is given in Messrs. Doulton's catalogue shows the great simplicity and self-cleansing action of the basin trap. The trap is made in two forms, the "shoot-out" and "turn-down," and is joined to the basin by Doulton's patent "metallo-ceramic" joint, which we have before described. A few designs are shown of the closet, which is made either in plain white Queenware, or otherwise enriched by printed ornament and by decoration in low relief, plain, and in colours and gold. These designs show the "acanthus" decoration in green and gold, and "chrysanthemum" pattern in colours. The prices are reasonable, ranging from £7 7s. in white ware, complete, to £15 5s. in the more decorative styles. We recommend the "Simplicitas valve closet" to all members of the profession who desire to specify a really excellent apparatus.

At the first meeting of the creditors of Thomas Martin, builder, of Boyn Hill, Maidenhead, the statement of affairs disclosed gross liabilities amounting to £7,821 11s. 11d.: assets, gross £2,067 18s. 9d., nett £20 8s. 3d. The debtor attributes his position to the technical schools contract.

At the colliery village of North Elmsall, near South Kirkby, Mrs. Hugh Longueville Jones has determined to build a church. The church is to be called St. Margaret, Virgin and Martyr. It will be built of stone from Horseforth, near Leeds, and will be lined inside with the red-coloured stone from Carlisle; the columns, stringcourses, and mouldings of the windows and doorways being made in cream-coloured Ancaster stone. The ceilings, seats, pulpit, and screens will be in oak. The church will accommodate about 150 people. The foundation-stone was laid on Thursday week. Mr. A. H. Hoole, King William-street, Strand, is the architect.

Mr. William James Ayles, of Ringwood, has been elected as surveyor and inspector of nuisances by the urban sanitary authority of Stockbridge, Hants.

At Dulverton, last week, two new roads giving more direct access to the railway station were formally opened. One forms a new route from Pixon Market to the Snapbox on the Minehead-road, the other is made from the station to Brushford Village. The land and materials were given by the local land owners, and the expense, borne locally and by the county councils of Devon and Somerset, amounted to £1,700.

The corner stones of the chapel in course of erection at Llangefni, co. Anglesey, as a memorial to the Rev. John Elias, the well-known preacher of the Welsh Calvinistic Methodists, were laid on Friday. The building is being erected from the designs of Messrs. O. M. Roberts and Son, architects, Portmadoc.

A large chiming clock, with three dials, is to be erected upon West Teignmouth church tower by John Smith and Sons, Derby, who also made the clock upon the East Teignmouth church a few years ago.

The new Wesleyan chapel at Fenwick, near Doncaster, situate near the main street, was opened on Friday. The chapel accommodates 134 persons, and has been built from the designs of Mr. Greenhalgh Walker, of Doncaster, by Mr. Reynolds, builder, of Askern, at an estimate of £431.

A long discussion took place at the last meeting of the town council for Blackburn on the proposal to pay the new borough engineer £700 a year. Alderman T. E. Thompson characterised the proposal to give £700 a year in salary to the borough engineer as absolutely ridiculous, in view of the fact that the last gentleman filling the office had only been paid £400. Eventually the recommendation for the increase was adopted.

## OBITUARY.

MR. WILLIAM HENRY CLARK, a Bristol architect, was found dead at his lodgings in Arley Hill, near that city, on Saturday, with a bullet-wound through the temple. His brother called to see him, and, believing he was upstairs, waited a considerable time. As he did not make an appearance, the brother searched the house, and found him as described. A five-chambered revolver was lying at his feet. He had been dead some time. Deceased was about fifty years of age.

MR. E. J. NEVILLE STENT, an architect and designer, died recently at an advanced age in New Jersey. Mr. Stent was an Englishman, but had lived in New York for many years. He was widely known in the United States as an expert designer and decorative colourist, as well as a skilful architect, particularly in ecclesiastical work. The American Institute of Architects formerly issued to its members a diploma, which was designed by Mr. Stent, and which was illustrated by us so far back as March 15, 1872. A large part of his professional work was done as an assistant to other architects; but he designed some important mercantile and other buildings for the Astor estate, and of late years had practised extensively as a church architect.

## CHIPS.

Mr. Daniel C. French has been selected by the Municipal Art Society of New York to design and execute the memorial of the late Richard M. Hunt, Royal Gold Medallist of the R.I.B.A., which is to be erected in the Central Park of New York.

A meeting has been held at Eastleigh, Hants, to consider the advisability of enlarging the parish church. Plans have been prepared by Sir Arthur W. Blomfield, A.R.A., for the increase of the accommodation so as to seat 950 persons, and the estimated cost is £8,000. Resolutions were passed approving of the scheme, and a building committee was appointed.

At the Wesleyan Chapel at Matlock-Bank, on Friday, an organ, built by Messrs. Cousins and Sons, of Lincoln, at a cost of £350, was opened.

Mr. Arnold Royle, C.B., of the Medical Department of the Local Government Board, held an inquiry at Bristol, on Friday, into an application made by the city council for sanction to borrow £27,592 for the provision of an infectious diseases hospital at Ham Green, Easton-in-Gordano. The hospital plans were produced and explained by Mr. T. H. Yabbicom, city engineer.

Colonel Luard, one of the inspectors of the Local Government Board, has held an inquiry at the town-hall, Malton, with respect to an application of the Malton urban council to borrow £2,058 5s. for the improvement of the town's water supply.

On Saturday afternoon, a new recreation ground in Vicarage-road, Battersea, was thrown open to the public. The ground is 400ft. in length, and has an area of about 2,700yds., extending along the bank of the Thames. It has been laid out by the Battersea Vestry at a total cost, including the construction of the embankment wall, of £3,678, towards which an anonymous donor contributed £1,000.

Mr. J. Passmore Edwards has offered to build a school for technical instruction at Helston.

In aid of the rebuilding of the parish church at Carlton Miniott, a two days' sale of work was opened at Thirsk on Friday. The work of rebuilding, intrusted to Mr. Harwood, of Manfield, Darlington, is now rapidly progressing. The cost is estimated at about £1,200.

At the seventh meeting of the session of the Edinburgh Architectural Society on Thursday last week, Mr. Alex. McGibbon, A.R.I.B.A., hon. president, Glasgow Architectural Association, gave an address on "Gothic as a Style for Modern Use."

Cardinal Vaughan opened on Friday the new chapel at St. John's Seminary, Womersley, which has been given by Mr. Brodick, of Brighton, at a cost of £5,000. The chapel completes the new seminary buildings for the training of secular priests in the diocese of Southwark.

The new offices erected for the urban district council of St. Thomas next Exeter were opened on Wednesday week. They have been erected by Mr. C. Brealy, of Exeter, under the direction of the surveyor to the council.

At Sittingbourne, bricks have gone up in price, and the rise, combined with the steady demand, tends to make the prospects of the brickmaking season the brightest since the great strike and lock-out in the district. The local brickmaking firms are, says the *South Eastern Gazette*, extremely busy, and orders cannot be executed sufficiently fast to keep pace with the demand.

## ARCHITECTURAL &amp; ARCHÆOLOGICAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION. — The annual general meeting of this association was held on the 6th inst. in the Royal Institution, Princes-street, Edinburgh, Mr. Thomas Ross, vice-president, in the chair. Mr. T. Bonnar moved: "That as ladies are invited to the meetings of the association and take an interest in the papers and discussions, it is desirable that they should also be present at the Association's excursions. It is, therefore, moved that each member should be allowed to provide himself with two tickets in addition to his own for each excursion, such tickets to be used only by lady friends." He thought the experiment should be tried, and he expressed the opinion that the advantage would be appreciated by ladies. Mr. J. Morham seconded, and said the proposal would be a benefit to ladies. The Rev. Mr. Herford moved as an amendment that each member receive one ticket in addition to his own. The number must be limited on those excursions. Mr. J. Balfour Paul moved that the matter be remitted to the council for consideration, and after some further remarks this was agreed to. Several reports regarding the work of the association were submitted and approved of, including the report of the treasurer, Mr. J. Johnston, C.A., which stated that the membership had increased to 304, and that the finances of the association were in a satisfactory state. The office-bearers were elected as follows for the ensuing year:—President, Dr. R. Rowand Anderson; vice-presidents, T. Ross and J. Balfour Paul; treasurer, J. Johnston; and secretary, T. Fairbairn.

GLASGOW ARCHITECTURAL ASSOCIATION.—Professor Charles Gourlay, A.R.I.B.A., I.A., delivered a paper to the above association on the evening of Tuesday, the 5th inst. The subject, "Notes on Stresses," was very fully treated upon by the essayist. He took the beam as the ground-work for his remarks, and showed how beams of different description were acted upon by loads of varying intensity and disposition. The underside of beams, the essayist pointed out, should not have the corners chamfered or moulded, as this weakened the beam where strength is most required. The paper was profusely illustrated with diagrams. A vote of thanks terminated the proceedings.

The contract for the construction of the Bhalapore water-supply works has been placed with Messrs. Martin and Co.

The new waterworks at Warsaw, commenced 15 years ago, have just been completed. The city is supplied by an aqueduct 114 miles in length, and the conduits in the city itself measure over 50 miles. Chiefly owing to this improved water-supply the death-rate in Warsaw has declined from 33·5 to 24 per thousand.

The Visiting Committee of the Kesteven and Grantham District Lunatic Asylum have decided to take immediate steps to adapt the old union work-house, which has been hired from the G.N.R., to the purposes of a temporary asylum. The work was intrusted to the county surveyor, Mr. Herbert Kirk, of Sleaford, with instructions to meet Dr. Ewan, and confer.

A meeting of the Stanhope Urban Council and the trustees of the old town-hall has been held for the purpose of conferring with Mr. G. Gordon Hoskins, F.R.I.B.A., of Darlington, with a view to his preparing drawings for a new town-hall. The site selected forms at present part of the Castle gardens, and is in every way a most suitable one. It is proposed to devote the whole of the ground-floor of the building to technical education, whilst the Town-hall proper, staircases, &c., will occupy the whole of the area on the first floor.

Mr. Chamberlain visited Cordwainers' Hall, in Cannon-street, on Wednesday, and unveiled a centenary memorial window to Mr. John Came, a cordwainer and benefactor of the company, who died on May 13, 1796. The window has a central figure representing a gentleman clad in the dress of the period when John Came lived, and is emblematical of a member of the Cordwainers' Company, being clothed with the livery gown, as befitting one representing a past master. The figure is placed in a niche of Italian Renaissance work, and above it the arms of the company are introduced. On the left hand are John Came's coat of arms, and on the right the arms of the present Master. Below these are the figures of St. Crispin and St. Crispinian, the patron saints of Cordwainers. The window is the work of Messrs. James Powell and Son, of Whitefriars.



## COMPETITIONS.

**LLANDRINDOD WELLS.**—The Governors have appointed Mr. H. Teather, of Cardiff, as architect for the Intermediate School, Llandrindod Wells. The design placed second was by Mr. Hampden W. Pratt, of Chancery-lane, London; Messrs. Wilson and Moxham, of Swansea, third, and coupled with the latter a design by Messrs. O. M. Roberts and Son, of Portmadoc. The assessor was Mr. S. W. Williams, of Rhayader.

**SHAW.**—In a recent limited competition for proposed new infants' school, Shaw, the design of Mr. Charles T. Taylor, A.R.I.B.A., architect, Clegg-street, Oldham, has been accepted.

## CHIPS.

On Monday week the foundation-stone of the new Church of St. John-the-Evangelist, Hills-road, Cambridge, was laid by Lady Alwyne Compton, wife of the Bishop of Ely. The cost of this first section (which consists of the chancel and two bays of the nave) is £2,350, of which £1,250 has been promised. The church will be built of red brick with Weldon stone facings, and is in the Decorated style. A donor has promised to fill the east window with stained glass.

On Wednesday week the Bishop of Marlborough laid the foundation-stone of the convent and hospital of the Sisters of SS. Mary and John, in Burlington-lane, Chiswick. Three acres of land has been acquired at Chiswick, and here it is proposed to erect a convent, hospital, and chapel. The convent will accommodate thirty Sisters and the hospital about one hundred patients. The architect is Mr. C. A. Ford Whitcombe.

There died on Tuesday at his residence, Gideon-street, Bathgate, Thomas Anderson, joiner, at the age of seventy-six years. Mr. Anderson has left the whole of his heritable property, amounting in value to about £1,000, for the erection of a Burns statue in Machline.

At a meeting of Kilmarnock School Board on Tuesday offers were accepted for the erection of the new Secondary and Technical School. The aggregate cost is £7,572.

A new clothing factory for Messrs. W. Blackburn and Co. has just been built at Holbeck, Leeds, from designs by Mr. Archibald Neill, of Cookridge-street, Leeds. It stands on what were formerly gardens abutting on Springwell-road.

The Yost typewriter has just been awarded a gold medal at the Manchester Building Trades Exhibition. This makes the eleventh gold medal won by this famous writing machine.

At Selkirk, on Friday, Lady Napier and Ettrick was presented with the portrait of her husband, painted by Sir George Reid, P.R.S.A., and representing him in diplomatic costume, in celebration of their golden wedding, and a replica was presented to the county of Selkirk, to be hung in the county buildings. They were the gifts of a large number of subscribers in the county.

The London and South-Western Railway Co. will next month invite tenders for the works of extension from Holsworthy to Bude.

The death took place on Friday at Haddington of Mr. John Nelson, who for the long period between 1864 and 1893 occupied the position of road surveyor for East Lothian. Since his retirement from active duty, Mr. Nelson has continued to act as consulting surveyor.

Operations have been begun in enlarging and reconstructing the railway station at Harrogate. The works will be carried out from plans by Mr. Bell, architect to the railway company, at a cost of from £25,000 to £30,000.

On Thursday afternoon in last week, the Wesleyan chapel at Brownhills, Staffs, was reopened after enlargement, effected by taking in the old school-room, and a complete restoration. A new font has been erected, new seats substituted for the old pews, a rostrum put up in place of the old pulpit, choir stalls added, and the organ rebuilt. The cost of the work has been £300, while £410 more has been spent in acquiring land, and building new schools. The designs were prepared by Mr. J. H. Shaw, surveyor to the urban council, who acted as hon. architect, and the builder was Mr. R. Harris, of Sheffield.

Chard Town Council have resolved to ask the sanction of the Local Government Board to borrow £6,000 for drainage works. A new water supply for the borough is also in contemplation.

The waterworks committee of the Hull Corporation decided on Friday to advertise for an engineer at £450 a year. Mr. Bruce, the present engineer, declined, without consideration of the matter, to resign on the undertaking that in lieu of notice he should receive a year's salary, £400, to date from the appointment of his successor.

## "BUILDING NEWS" DESIGNING CLUB.

## EIGHTH LIST OF SUBJECTS.

**J.**—A Golf Club House for links on a moor; to be built in brick and timber, with roofs covered by tiles. The accommodation to comprise a general club-room, about 38ft. long by 28ft. wide, with a small refreshment-bar counter, which is not to project more than a few inches into the room, and to be served from the rear; a ladies' room, about 14ft. square, having an E.C. and lavatory attached; a dressing-room for gentlemen, and a drying-room adjoining the former, say, 15ft. by 18ft., and the latter near 15ft. by 12ft.; a good lavatory and a bath, two E.C.'s, and some urinals to be provided; an attendants' kitchen and scullery, with larder, will be required of suitable size, and not too big. A spacious verandah, about 12ft. wide, is to extend on the first floor along the front of the club-house, overlooking the links. This may be contrived over a portion of the ground-floor rooms. The remainder of the first-floor space is to be used for a luncheon-room, 38ft. by about 18ft.; and besides a committee-room of near 300ft. super., a bedroom is required for the two servants, a man and his wife. The luncheon-room must have a small service-room attached, and a lift. The stairs to the first floor are to be 4ft. wide, and convenient to the entrance hall, which is to be 10ft. wide. A water-tank (supplied from a well) will be needed, and this may be located in a square-planned tower, of which a feature may be made externally. The treatment is to be simple and substantial, with due regard to an exposed situation. The building faces the south-west, and being near the east coast, the rear of the premises should be planned to keep out the winds from the North Sea during the winter months. Two plans—one elevation and a view; scale, 8ft. to the inch. Plans may be to 1/4 in. to the foot if a second elevation or section are given—and this may be desirable.

**DRAWINGS RECEIVED.**—“Boer,” “Brian,” “Invicta,” “Oberton,” “Mandalay,” “Gilbert,” “La Tigale,” “Owl,” “Pickwick,” “Vormack the Viking,” “Carloliol,” “Mannikin,” “Oriel Bill.”

“INVICTA.”—You misread the conditions. The obvious reason why the drawings illustrating a design must be on one sheet is that otherwise their illustration would be impossible without cutting up the drawings. For many years the rules have stood in their present form, and all the leading contributors, at any rate, have hitherto read them to mean one sheet for each subject. We have not disqualified you; but placed your design on its merits. **JAMES COOPER.**—(Your remarks on the two selected designs for the stable buildings are duly noted. We did not illustrate them as “anything like perfect.” No piggeries and poultry-runs were asked for.)

## Correspondence.

## ARCHITECTS' CERTIFICATES NOT ENFORCEABLE.

To the Editor of the BUILDING NEWS.

**SIR,**—As solicitors for the defendant, Mr. Mugeridge, in the case of “Anderson v. Mugeridge,” tried before the Common Serjeant and a jury on the 1st inst., we must protest against the report of that case and the letter signed by the plaintiff, both of which appear in your issue of the 8th inst. We would point out that the head-note to the letter in question is entirely misleading, as are also the letter itself and the report of the case.

As the appeal from the decision of the Common Serjeant will shortly be heard, we do not wish—nor do we think it right—to enter into any controversy in the matter; but we think it fair to yourself and your readers to ask you and them to withhold their judgment on this matter until the appeal is heard.

Trusting you will give the same publicity to this letter as you have done to that of Mr. Anderson,—We are, &c.,

CLOWES, HICKLEY, and STEWARD.

10, King's Bench-walk, Temple, E.C., May 11.

[With pleasure. We need hardly say our only interest in the case is a public one, and to see a fair decision arrived at.—Ed.]

## THE INSTITUTE AND ITS FINANCES.

**SIR,**—I quite agree with the view you expressed in your article of last week, that the apathy shown by the majority of members of the Institute in its affairs is a most regrettable circumstance. The ancient and honourable Council get their adherents together, and, backed up by the recipients of charity, whose existence depends upon an increase of the deficit, the policy of failure is endorsed. The action of the Council in not publishing the auditors' report in such a way as to afford opportunity for following the figures and thoroughly understanding it, is one which, in the case of a public company, would bring down upon the Council the rebuke, to say the least, of any judge on the Bench. Of course, my reference to figures must have been confusing to those who had not studied the subject, and the Council were by no means ignorant of this fact when they elected to withhold the auditors' report.

As regards the new conditions of contract, I shall be prepared to prove my assertions, and it will be found that where a first-class builder has signed them they have been previously modified to a considerable extent.

As regards the action of the Practice Standing Committee with fire insurance companies, my contention is not that the committee were wrong in not publishing an incomplete correspondence, but that they have no right or authority whatever to pledge the credit of the general body of members in matters about which the general body may hold views absolutely antagonistic to those of the few gentlemen of a committee more or less acquainted with the bearings of a delicate subject such as interference with the professional charges of architects. The committee's action has done more harm than good to architects in dealing with insurance offices, and I repeat that there is nothing in the charter or in the by-laws which justifies any such interference. And so I say with regard to other matters affecting the profession at large, in which these committees have interfered entirely at their own initiation. Again, I should be the last to object to an assessor's report being set aside, particularly one by Mr. James Brooks, and equally do I not call in question his selection of Mr. Caroe's design. What I say is that the Art Standing Committee has no mandate from the general body to attempt to coerce building committees to the Art Standing Committee's particular way of thinking. This subject of interference by the standing committees is a very important one, and should be dealt with, in a formal manner, at an early date.

It is too late now to organise and wipe out the majority of this obsolete and extravagant Council; but I hope that before the election next year the general body will wake up to the fact that the Royal Institute of British Architects, as represented by the present Council and committees, is distinctly on the downward path as regards its finances, and at low-water level as regards its usefulness.—I am, &c., **WM. WOODWARD.**

13, Southampton-street, Strand, May 13.

## ARCHITECTS' QUANTITIES.

**SIR,**—Having read the correspondence in this week's issue on the above question, I would call your attention to the fact that some time ago I wrote to you suggesting the formation of a society or institute of quantity surveyors with a view to ultimately bringing about that uniformity of practice in the preparation of bills of quantities which is so much to be desired; unfortunately, you did not see fit to publish my letter at the time (some two years ago).

My idea is that quantity surveyors should form a society of their own, the members of which, in the first instance, should be quantity surveyors already in practice, and the qualification should consist in production of properly prepared bills of quantities for inspection by the committee, which should be formed of the leading London quantity surveyors; that examinations should be held for students, the principal textbook being Mr. John Leaning's work, the system advocated therein being undoubtedly the most perfect, and which, if properly followed, as it mostly is, by quantity surveyors proper, would meet all the objections raised by your correspondents this week.

The Surveyors' Institution does not seem to me to exactly meet the question, for although many of our leading quantity surveyors are F.S.I.'s, that element is vastly outnumbered by the land surveying and auctioneer elements who are likewise F.S.I.'s, but the majority of whom could certainly not prepare a satisfactory bill of quantities.

In course of time the society I suggest might gradually educate building owners to the fact that they would find it greatly to their interests to have the quantities prepared by a quantity surveyor properly qualified for this work, instead of leaving it all in the hands of the architect, whose qualifications for the work in numerous instances, as cited by “Sigma,” “J. S. B.,” and a “Country Contractor,” make them no more suitable for the work than the average local doctor would be to operate on the eye as compared with a specially-trained oculist.

One significant fact which should make the building owner pause before allowing the quantities to be prepared by the architect is that the large spending bodies of the Metropolis—viz., the London School Board, the Metropolitan Asylums Board, and the London County Council—all have



the quantities prepared by quantity surveyors, and never by the architects to the work.

In the case of War Department buildings, except for small jobs under £5,000, a meeting of contractors invited to tender is called, at which they elect a surveyor to prepare the quantities in conjunction with the Royal Engineer surveyor, which surveyor, although elected by the contractors, is paid by the Government.

Trusting you will be able to find space in your valuable paper for this letter, which I hope may lead to the formation of some such society as proposed.—I am, &c., ALEXANDER H. KINDER.  
23, Finsbury-circus, London, E.C., May 8.

#### STRENGTH OF BRICKWORK PIERS.

Sm,—Will you allow me to thank Mr. F. Walker for his kindness in answering my letter in your issue of the 8th? When I referred him to the Midland Grand Hotel as a specimen of materials and workmanship, from my own experience I knew that both were good, as I saw the works several times during the time they were in progress, and admired the quality of the work and design of the buildings, which, in my opinion, rank as one of the finest brick buildings in London. As regards the strength of 18in. piers, were the tests a fair average of the weight they would have to carry in a building of the warehouse class? If they were, it is time that architects discarded that size pier, as it appears from the tests that a 14in. pier was 25 per cent. stronger. I am sorry to say that I have not been able to see the diagrams showing the results of the test. As regards the quality of American bricks, the hint may prove useful to our British manufacturers.—I am, &c., H. J. BLAKE.

#### CHIPS.

Having accepted an invitation sent through the Bristol Trades Council by the Rev. Canon Barnett to visit the Bristol Cathedral, a party of members of the local branches of the National Association of Operative Plasterers attended there on Saturday, and were met by the Rev. Canon, who conducted them over the edifice. Service was afterwards attended, and then Canon Barnett entertained the party to tea at his residence.

The old premises of the London and County Bank at Aldershot, which are under process of demolition, collapsed on Saturday, burying the foreman scaffolder named Corder, and the landlord of the King's Arms, named Ash. When extricated both were dead. Other persons were seriously injured.

New works of water supply, which are being carried out for the town commissioners of Bangor, Co. Down, were formally inspected by Mr. Cotton, C.E., on behalf of the Local Government Board for Ireland, last week. The estimated cost is £9,800, and the work is being carried out from plans by Mr. Henry Chappell, C.E.

As a result of the gift of £2,500 by the Shahzada during his visit to Liverpool, the lecture-hall of the Liverpool Moslem Institute, 8, Brougham-terrace, has been reconstructed in the Saracenic style, from the designs of Mr. J. H. McGovern, 8, Vernon-street, in that city, architect. Mr. Hobhouse acted as clerk of works.

The Liverpool and North Wales Railway will be opened for traffic on Monday next.

Alderman Holden, of Walsall, has presented to the proposed art gallery for that town its first picture—an oil-painting, by G. E. Low, representing the "Tre-ar-Ceiri," a prehistoric tower on one of the Rivals overlooking Nevin, Carnarvonshire.

Mr. J. Macdonald, of Manchester, has been appointed by the town council of Newport, Mon., working manager at Wentwood Waterworks, at £250 per annum. There were 80 applicants.

The new post-office, Rotheay, is being warmed and ventilated by means of Shorland's patent Manchester stoves with open fires, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

In the case of the application of Louis Henry Lipscomb, the Beulah Joinery Works, Comely-bank-road, Walthamstow, builder and contractor, the discharge from bankruptcy has been suspended for four years, ending March 27, 1900.

The new church at Oxford, erected by the efforts of the Society of St. John the Evangelist, was dedicated on Tuesday by the Bishop of Oxford. It is the first conventual church that has been built for the use of the English Church on any considerable scale for many generations. For the last 26 years the members of the brotherhood have ministered in an iron building. The new fabric when completed will cost about £12,000, and the work already finished consists of the chancel and nave.

## Legal.

### BLACK LISTS AND BUILDERS.

THE result of the action brought by Messrs. Trollope and others against the London Building Trades Federation (*Times*, May 5) should be satisfactory, in so far as it lays down the law for the future guidance of those who may be concerned in such matters. It was, of course, the old story of rivalry between Union and non-Union men, and the list in question was a large yellow poster edged with black, and containing the names of various men outside the Union who had made themselves obnoxious to the Union by working for Messrs. Trollope during a strike. These men were called in the usual slang, "black-legs," and were said to work "black." The real point at issue was whether the defendants could legally justify their publication as having been made without malice, and in the legitimate and *bona fide* interests of the Federation. If they had succeeded in establishing this justification, it would have gone some way towards supporting similar actions by every trade union in every strike that might hereafter occur, and in which some men would be sure to work "black," or, in other words, to remain free to work when and where and for what wages they liked. Of course, such a list would obviously be injurious to the employers whom it affected, as well as, and even more so, to the men whom it included, by giving them a bad name in the trade and amongst their fellows.

After hearing all the evidence and a summing-up by Mr. Justice Hawkins, the jury decided that the List had not been published *bona fide*, and for the purpose of protecting the interests of the Federation, but maliciously to compel Messrs. Trollope to dismiss the non-Union men, and that its publication injured both these men and their employers. They gave the builders a verdict for £500 damages, subject to arrangement between the parties, the men not having been financially injured, because the builders have kept them on at work during the whole time, and an injunction against the issuing of the List was made perpetual. It is not easy to see how the result could have been different upon the admitted facts, for in law no one can do a thing, even when he has a right to do it, when he does it maliciously and to the injury of others.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

STAMP.—AGREEMENT.—The fact that a limited company signs its name by affixing its seal would not make any difference, and the ordinary stamp would still be applicable.

At a largely attended and influential meeting held on Friday at the house of the late Lord Leighton, under the presidency of the Marquis of Lorne, M.P., resolutions were unanimously carried, on the motions of Lord Loch, Mr. A. Gilbert, R.A., Mr. Alfred Waterhouse, R.A., and Mr. G. A. Macmillan, declaring it to be desirable that the house should be secured to the nation as a fitting memorial of his life's work, as a museum of rare art treasures and a school of great value for students of decorative art, and recommending the appointment of an executive committee for the accomplishment of this object. It was mentioned that at least £35,000, and probably £50,000, would be required.

Mr. Arthur J. Hay, of Hayfield, Lerrwick, with the object of accommodating the increasing trade of the district, has accepted contracts for improvements and additions to the pier at Blackness, in the bay of Scalloway. The works will cost about £2,000, and have been designed by Mr. James Barron, C.E., Aberdeen.

A new pier and landing-stage for accommodating the ferry and steamer traffic in the Menai Straits at Bangor was opened by Lord Penrhyn yesterday. The pier is 1,550ft. long and 24ft. wide, and is constructed of iron screw piles and steel girders which carry the timber deck; there are eight embayments, upon which are built ornamental kiosks, and the head is increased in width to allow ample room for promenading. The landing-stage at the end of the pier consists of floating pontoons approached from the pier by a bow-string girder. The pier will be of great service to the neighbourhood, and will command a fine view of the Straits and Welsh mountains. The works, which have cost about £20,000, were designed by Mr. John J. Webster, M.Inst.C.E., of Westminster, Mr. Alfred Thorne being the contractor.

### LEGAL INTELLIGENCE.

IN RE T. H. BURNETT.—Thomas Henry Burnett, of Wood Furze, Abbey-road, and 50, Corporation-road, Grimsby, builder, and a member of the Grimsby Corporation, came up for his first public examination at the Grimsby Bankruptcy Court on Friday. Debtor started in business 25 years ago without any capital. His sworn statement of affairs showed that he owed to unsecured creditors £15,934 17s. 4d. His assets consisted of £221 for furniture, but he owed £10 4s. 6d. for preferential claims, leaving free assets at £210 15s. 6d., and showing a deficiency of £15,724 1s. 10d. In 1882 he effected a composition with his creditors, and was released upon payment of 2s. 6d. in the £. At that time his liabilities were £3,000. Debtor attributed his present insolvency to want of capital and heavy interest on borrowed money, he having paid 20 per cent. upon mortgages. The examination was adjourned until July, after debtor had been questioned.

RE W. F. CONEY.—A first meeting of creditors was held on May 8th. The debtor, a builder and contractor, trading at 68, Fenchurch-street, was also a town councillor for Southend-on-Sea. He now submitted a proposal of 10s. in the £, and the meeting was adjourned for a fortnight, in order that the proposal might be carried into effect. The unsecured debts are returned at £215, and debts fully secured £13,300; assets, £100.

LEGALITY OF ROOD-SCREEN FIGURES.—At the Norwich Consistory Court, on Thursday in last week, before Mr. T. C. Blofield, Chancellor, a petition was presented by the rector and churchwarden of Holy Trinity, Barham, for a confirmatory faculty authorising the three figures of our Lord upon the Cross, the Virgin Mary, and St. John on the chancel screen, and also four bells set up in the church in 1893 without a faculty. The petition was unopposed. It was submitted that the figures on the screen were lawful according to the test established by the Privy Council in "Philpotts v. Boyd," there being no circumstances in the case to make it appear to the Court that there was a probability of the figures being subjected to superstitious reverence. The cases of "Clifton v. Ridsdale" and "St. John, Timberhill, Norwich" (1895) were distinguishable on the ground that there were circumstances in those cases which influenced the Court in coming to a different conclusion. It was contended that the teaching of the Church had brought about a change in regard to worship and adoration of images, and that paintings, windows, and sculptured representations of our Lord, and even crosses, which had been so much abused, were now allowed in churches, and were admittedly free from the taint of superstition which formerly attached to them. It was pointed out that the figures on the screen were architectural decorations forming an historical group, as distinguished from an isolated figure, which might be of a devotional character. "In re St. Lawrence, Pitlington," and per Lord Esher in "Reg. v. Bishop of London," and that the position of the figures was not a sufficient ground for refusing the faculty, unless there were other circumstances in the case which pointed to the probability, and not merely the possibility, of their being abused ("Hughes v. Edwards"). The Chancellor stated that the point was an important one, and that he would take time to consider his judgment.

WIDENING OF THE CHESTER AND BIRKENHEAD RAILWAY.—The awards of Mr. J. W. Fair have now been made in the arbitration cases held at the North-Western Hotel, Lime-street Station, Liverpool, on the 24th and 25th of January last, in respect of land required for railway purposes from Mr. J. J. Briscoe, near Hooton Station, and from Mr. J. S. Thomson, near Bromborough Station. In the former case the area of land taken is 7a. 1r. 1p., for which Mr. Briscoe claimed £3,850. The offer made by the joint railway companies was £2,305, the award being £2,488. In the case of Mr. Thomson the area of land taken is 3a. 3r. 20p. The claim in this instance was £3,025, and the joint railway companies offered £1,355. The amount of the award is £1,286. The award in the arbitration in respect of land required from Miss Dora Gill, near Ledsham Station, has also been issued. In this instance, the area taken is 2a. 3r. 33p., and for the land Miss Gill claimed £1,355. The amount of the award is £760, which is less than the amount offered by the joint railway companies prior to the arbitration.

UPPER THAMES STREET WIDENING.—At the Guildhall, the other day, the case of "Coles v. The Commissioners of Sewers" was heard by the Recorder and a special jury. It was a claim by Mr. J. H. Coles, printing-ink merchant, freeholder of Vulcan Wharf, Upper Thames-street, for £5,720 in respect of the compulsory acquisition of the premises mentioned, which were required in connection with the widening of Upper Thames-street. Mr. Edward Power, the district surveyor for the southern division of the City, said the area of the property was 628 superficial feet. It projected about 14ft. into Upper Thames-street, and so occupied a very prominent position. There were also wharfage



rights in connection with the property. Dealing with it as though it were vacant building land his estimate of its value was £6,776, but dealt with on another basis, his estimate was £5,737. On behalf of the Commissioners of Sewers, the witnesses called included Mr. Stenning, who put the value at £3,434; Mr. Vigers, who put it at £3,138; and Mr. Walker, whose figures were £3,864. In the result the jury awarded the plaintiff £4,300.

**LONDON BUILDING ACT NOT RETROSPECTIVE.**—At North London Police-court on April 30, Arthur and Albert Simpson, builders, of Roding-road, Homerton, were summoned before Mr. Paul Taylor for a contravention of the London Building Act, 1894, in erecting a building at the corner of Roding and Ashenden-roads beyond the building line as defined by the superintending architect of the London County Council. The summons was issued by Mr. Samuel Meeson, the district surveyor. For the defence it was submitted that the building was carried out under a contract which was entered into before the passing of the 1894 Act. The contract was produced, and for the prosecution it was pointed out that it contained a provision that the buildings should be erected according to the provisions of the then existing Building Act, or any future enactment regulating buildings. This contention was disputed by the other side, and Mr. Paul Taylor held that the provision in the Act of 1894 expressly exempting buildings erected under contracts entered into before the Act came into operation, must apply to this case. He therefore dismissed the summons. Defendants did not ask for costs.

**DILAPIDATIONS.**—A dilapidation case involving some points of more than usual interest came before Mr. Philip E. Pilditch, architect and surveyor, of 17, Parliament-street, Whitehall, sitting as umpire at the King's Head Hotel, Horsham (the property in respect of which the case arose) on Thursday last. Mr. E. Shortte, instructed by Messrs. Adams and Hugonin, was counsel for Mr. Groom, the plaintiff, and Mr. Muier, instructed by Mr. Cotching, was counsel for Mr. Naldrett, defendant. Mr. F. H. King was surveyor for the plaintiff, and Mr. Aldridge was for the defendant. From the opening statements of counsel it appeared that the defendant originally held the premises on lease, on the expiration of which he took a new lease for seven years, determinable by the freeholder at three months' notice. After the creation of the tenancy the freeholder sold his reversion to the plaintiff, and vacant possession being required, served the lessee, the defendant, with notice to quit, which notice expired on the day fixed for the completion of the purchase, and when only seven months of the term had run. The repairing covenants in the lease were as follows:—"At all times during the said term to keep the said premises in good and sufficient condition and repair, and the same, in good and sufficient condition and repair, deliver up to the lessor at the expiration or sooner determination of the said term." And there was a specific covenant for painting outside in the third and last years of the term, and inside in the last year, and at the same time with every outside painting to restore and make good the outside stucco work, and with every inside painting to grain, paper, whitewash, and colour the parts usually so treated internally. Plaintiff's counsel maintained that the basis of assessment should be that laid down in the case of "Proudfoot v. Hart," and urged that the application of that rule to the present case would suggest that the defendant was liable for putting the premises in such a state of repair as to make them fit for a reasonably-minded hotel-keeper of high-class standing. Counsel for defendant pointed out that the specific painting covenant never came into force at all, the lease having been determined when it had only been in existence seven months, and that the other repairs referred to in the specific covenants were on the same footing; that the premises had been put in repair by the lessee under the former lease at a cost of about £300. £581 had been mentioned as the present claim, and this was for a tenancy only extending over seven months. That the lease was determined two days before the conveyance to the purchaser; therefore the purchaser never became assignee of the reversion. Counsel then went on to quote various cases, and urged that the state and general condition of the premises at the commencement of the term should be taken into account, and in fact it was only those dilapidations that had accrued during the seven months' tenancy which the plaintiff was entitled to recover. That his client was not liable for decorative repair, because the specific covenants providing for that had never come into force, and that, in fact, their presence lessened the lessee's liability for such work under the general covenants. Counsel for the plaintiff pointed out that the matter having been submitted to arbitration, defendant was stopped from denying the plaintiff's title under the lease. As regards the defendant only being liable for the dilapidations accrued during the seven months he was in possession, the question was, What is necessary to put the premises in repair now? If the premises were not in repair at the commencement of the term, it was

his duty to put them in repair as well as keep them in that condition. The reasonably minded tenant referred to in the decisions quoted was a new tenant. As to the repairs to be done with the specific paintings, he submitted that the intention of the covenant was not to limit that work to those periods only, but merely to fix those periods as a convenient time for such works. For the result we must await the publication of the award.

**WHAT IS A PARTY-WALL?**—*DRURY V. ARMY AND NAVY STORES.*—Judgment was given, on Wednesday, by Mr. Justice Wright and Mr. Justice Collins, in the Queen's Bench Division, in this case, which was stated by a Metropolitan magistrate upon a summons under the London Building Act, 1894, and raised a question under those provisions of that Act which were designed for the prevention of fire. Section 75 provides that "no building of the warehouse class shall extend to more than 250,000c.ft., unless divided by party-walls in such manner that no division shall extend to more than 250,000c.ft. Sections 79 and 59 contain provisions with regard to party-walls, requiring them to be of a certain thickness, and regulating the apertures in them. The defendants erected a building of the warehouse class of the capacity of 657,408c.ft., divided by two party-walls. One portion of the building extended to five stories, and the other to one story. The latter portion was lighted by a sky-light. There was a wall between these two portions of the building, which was admitted, as regards that part of it which reached the first story, to be a party-wall. But the defendants claimed that the part of the wall which extended above the first story was not a party-wall, and that they were, therefore, at liberty to construct windows and apertures in it without regard to the provisions of the Act dealing with party-walls. The magistrate refused to convict. Mr. Horace Avory, on behalf of the district surveyor for St. Margaret's, Westminster, Mr. E. Dru-Drury, contended that the whole wall in question was a party-wall, because section 59 provided that a party-wall "must be carried up of a thickness equal to the thickness of such wall in the topmost story of the highest building adjoining thereto, to such a height as will give a distance of at least 3ft. measured at right-angles to the slope of the roof. He referred to "Weston v. Arnold" and "Knight v. Pursell." He further argued that the contention of the defendants involved the anomaly of an external wall being built upon a party-wall. That was impossible, because rule 9 of the rules in the schedule to the Act provided that an external wall other than a wall erected on a bressumer should have footings of a prescribed character. The Court supported the decision of the magistrate. They held that the words "party-wall" in section 75 were not used in a technical sense, and that section 59 did not bear the construction put upon it by Mr. Avory. All that section meant was that so far as a wall was a party-wall it should comply with the requirements of the section; but there was no presumption that a wall which was a party-wall as to a portion of its height should be a party-wall as to its whole height. Section 75 did not make a wall a party-wall above the line where it ceased to divide the two buildings.

**CORPORATIONS AND MANORIAL RIGHTS IN THE SUBSOIL.**—*THE MAYOR OF TUNBRIDGE WELLS V. BAIRD AND OTHERS.*—This appeal, heard on May 5th by the Lord Chancellor and Lords Herschell, Macnaghten, and Morris, was made from a decision of the Court of Appeal reversing a decision of Mr. Justice Grantham. The question raised by the appeal was whether the appellants were entitled to construct and maintain a lavatory, &c., in the Pan-tiles at Tunbridge-wells under the surface of the raised footway or promenade and on a level with the carriage road. By the order of the Court of Appeal complained of, it was declared that the respondents, the plaintiffs below, as representing the lord of the manor, were entitled to the soil in which the lavatory was erected, and that the appellants, the defendants below, as the urban sanitary authority, had no right to construct the lavatory in question without the consent of the respondents. The case was tried before Mr. Justice Grantham, who gave judgment in favour of the appellants, with costs; but his decision was reversed by the Court of Appeal. The appellants now sought to have the decision of the latter Court reversed, and that of Mr. Justice Grantham restored. Their Lordships, without calling upon the learned counsel for the respondents to argue the case, dismissed the appeal with costs.

The proposed high-level roadway across the Old Haymarket formed the principal subject of discussion at the last meeting of the Liverpool City Council. Considerable difference of opinion appeared to exist as to the desirability of carrying out the scheme, but eventually an amendment was agreed to, by which a committee was authorised to ascertain and report to the council the probable cost which would be incurred in bringing the scheme to completion.

## PARLIAMENTARY NOTES.

**CHELSEA COMPANY'S WATER BILL.**—The committee of the House of Commons appointed to consider the Chelsea Water Bill, the Lambeth Water Bill, the Staines Reservoirs Bill, the New River Company Bill, and the Southwark and Vauxhall Water Bill considered the Chelsea Company's Bill on Tuesday and Wednesday. Mr. Rickards, in opening the case, said the measure sought to authorise the company to lay down a new 36in. main from West Molesey to Surbiton, to construct an additional filter bed and other works at Surbiton, to raise further money by debenture stock, and to confer further powers. The existing main could only just meet the wants of the district by conveying 14,000,000 gallons per day. Under the Bill the company would be able to supply a maximum of 18,000,000 gallons per day. The only other new work the company proposed was an acre of filter-beds, which would be constructed at Thames Ditton. It was proposed that for the construction of their works capital to the extent of £50,000 should be raised in debentures. The main and filter-beds proposed by the Bill would cost £48,000, and there would be left a margin of £2,000 for the acquisition of land, the expenses of the Bill, &c. Mr. R. Hack, engineer to the water company, gave evidence in support of the opening statement of counsel, and Mr. G. H. Gill, secretary, explained their financial position. Professors Crookes and Dewar gave evidence as to the healthy character of the water supplied from the filter-beds at Ditton. Mr. Alexander R. Binnie, engineer to the London County Council, declared that not only might Ditton prove dangerous in the long run, but it was unnecessary to take it. The County Council would not object to a third main being run from Molesey. The Committee decided on Wednesday to pass the preamble of the Bill as proved.

**LAMBETH WATER CO.'S BILL.**—This Bill came before a Committee of the House of Commons on Wednesday and Thursday in this week. Mr. Pember, in opening the case, explained that the object of the measure was to construct a reservoir at West Molesey between an existing reservoir of the company and Hurst-road, and to construct a second reservoir in the neighbourhood of the existing reservoir, and near the Cherry Orchard. Power was taken to enlarge existing reservoirs at Brixton and elsewhere, to make subsidiary works, divert footpaths, and so on, and to raise £500,000 of additional capital. Mr. F. Parkes, engineer to the company, gave evidence in support of the Bill.

**HOUSING OF THE WORKING CLASSES BILL.**—Lord Balfour, in moving the second reading of the above Bill, explained, on Monday, that it had been prepared to remedy a defect which was occasioned by an Act passed in 1892, amending the Housing of the Working Classes Act of 1890, so far as the latter measure related to Scotland. The Act of 1892 consisted only of two clauses, one of which was quite correct, but the other repealed the whole, instead of only a part (as was intended), of a section of the Act of 1890, with the result that urban authorities could not borrow money for the erection of dwellings for the working classes. The Bill proposed to repeal the defective Act of 1892, and then re-enact it without the defect. The Bill was read a second time.

**PARLIAMENT STREET IMPROVEMENTS.**—The Select Committee of the House of Commons, presided over by Mr. Akers Douglas, First Commissioner of Works, proceeded on Monday with the Public Offices (Site) Bill. Mr. Cameron, for the Treasury, explained the provisions of the Bill, which are for the acquisition of land in connection with the Parliament-street site, for the improvement and widening of Parliament-street, and the obtaining of a site on which to build public offices. The Institution of Civil Engineers had presented a petition, but there were no appearances against the Bill. A clause was inserted for the protection of that body, the preamble was declared proved, and the Bill ordered to be reported to the House.

A new Wesleyan chapel is about to be built at Kingswood from plans by Mr. La Trobe, of Bristol.

At the Surrey County Council, on Tuesday, it was reported that the terms had been arranged with Mr. J. Wolfe Barry, C.B., and that he was proceeding with the alternative design and estimates for a steel and stone bridge over the Thames at Kew.

Two additions have recently been made to St. Michael's Church, at Tivdale, near Dudley—a rood beam and balcony. The beam is fixed above the chancel capitals, and supports a cross, some 22ft. high, which bears a 7ft. 6in. figure of the Christ. On either side are pedestals, rising also from the beam, upon which stands the figures of St. Mary and St. John, of similar proportions. The screen is erected by subscription, in memory of the architect of the church, the late Mr. J. B. Davies, Dudley. The rood, calvary, and screen wall are the work of Messrs. Roddis and Nourse, Aston-road, Birmingham.



## Our Office Table.

At Tuesday's meeting of the London County Council the General Purposes Committee recommended that the salary of Mr. Shirley F. Murphy, the Medical Officer of Health to the Council, should be increased from £1,00 to £1,250 a-year. After some discussion the recommendation was agreed to, as was that referring to Mr. A. Young, the valuer, whose salary it was likewise resolved to increase from £1,000 to £1,250 a-year. It was agreed to contribute £8,150, one-half the net cost of dealing with an insanitary area in Limehouse, known as King John's-court and Limehouse-causeway. It is proposed to widen Limehouse-causeway and totally abolish King John's-court, and to rehouse the persons displaced in two-story cottage dwellings. The other portion of the cost of the improvement is to be borne by the Limehouse District Board. The Works Committee were allowed to expend £7,700 on building a Weights and Measures Office in Boundary-street, Bethnal Green.

"The History of Dress" was the subject of a lecture given at the Municipal School of Art, Manchester, on Monday night, by Mrs. Halliday Sparling (Miss May Morris). The address was freely illustrated by limelight slides. Most of the illustrations referring to the Mediaeval period (the 12th century being chosen as the point of departure) were taken from sculptures and old brasses. The lecturer showed that from the carefully cut effigies of knights and ladies, whether in flat brass or in sculptured stone, may be traced the history of evolution in dress, for the Mediaeval artist had no notion of slurring over details, and every feature in the costume was faithfully and minutely reproduced. Nor was either grace or dignity lacking, for, conventional as were the models upon which he worked, the artist seldom failed to invest even the stiff draperies compulsory in his work with a touch of simple dignity. Looked at carefully, they disclose many a detail missed at the first careless glance—the knight's surcoat, with its broiery of lions, leopards, or whatever might be his coat of arms, drawn out in such a manner that his name and lineage were obvious to all beholders; or the lady's plain long robe, with hanging jewelled belt and her cloak clasped with the brooch and pin which we now call Irish, but which appears to have been a common device in most European nations, as it is in Norway to the present day. Miss Morris traced the evolution of costume for men and women from the simple, though gorgeously coloured, dress of the 12th and 13th centuries, growing into extravagance until it reached the richly decorated but uncomfortable dress of Tudor times, with slighter notice of the waxing and waning eccentricities of the Restoration, the "powder period," and the recrudescence of the hoop petticoat, ending with the fashionable lady of 1896, *chic* and *piquante* in dress, and closing with a picture of her energetic sister on a bicycle in "rational" costume.

The highway committee of the Walsall Town Council received on Monday a deputation from the West Bromwich and District Permanent Building Society with reference to the bylaws recently put in force in the borough, requiring the division-walls in all properties to be 9in. thick. The memorialists explained that the building society considered the change likely to interfere seriously with their business and the artisan classes. Hundreds of small houses in the borough had been erected under the old bylaws with only 4½in. walls, and these were, they thought, sufficient, except in the case of outside gable ends. In neighbouring towns, Birmingham included, the division inside walls were allowed to be erected 4½in. thick. The committee will probably report to the town council that discretionary power should be delegated to the surveyor and the plans committee to allow 4½in. division inside walls to be constructed.

At Monday's meeting of the Cardiff Town Council an animated discussion took place anent Mr. Allan's contract with the corporation to supply blocks of Australian wood, known as "Jarrahdale Jarrah," for street-paving, and which was last week the subject of an expensive lawsuit. Mr. Allan, in view of the recent decision, asked the council to strike out the word "Jarrahdale" from the terms of the contract. Alderman Carey had given notice of a motion in favour of complying with Mr. Allan's request, and he admitted that

Mr. Allan had made a mistake in naming his wood Jarrahdale Jarrah; but he had paid for his mistake to the tune of £1,000. It was a mistake in geography. Alderman Rees moved an amendment to the effect that Mr. Allan should be requested to carry out his contract for the supply of Jarrahdale Jarrah blocks for street-paving, and in case of his non-compliance, the necessary steps be taken to determine the contract, and to advertise afresh for tenders. The amendment was eventually carried.

The water engineer of Cardiff, Mr. Priestly, has reported to the waterworks committee of the town council upon the action of the scavenging refuse, with which certain streets were made, on the water service pipes. Mr. Priestly states that the water mains and service pipes in Court-road and Cornwall-street were opened at seven different points on the 7th inst. In one or two places the pipes were found to be buried in a clay ground, and in these places they were not affected, being apparently as sound as when laid. In other places, where exposed to the action of chemicals in the scavenging refuse used in making up the road, the metal was affected both in the iron and lead pipes similarly to the samples shown from Gloucester-street, but not to the same extent, the corrosion being only just commencing. The pipes appear to have been affected more where they are lying in the wet refuse than where it is dry. The committee have desired Mr. Priestly to inquire whether other towns have met with similar difficulties, and to consult the borough analyst on the matter.

The first annual conference of the National Association of Master Plumbers of Great Britain and Ireland was held at Nottingham on Friday. In the absence of the president, Mr. H. Lightfoot, of Manchester, the chair was occupied by Mr. A. E. Biggs, of Leicester, who, in his opening remarks, said the Association was inaugurated twelve months ago at Leeds. At that time they had some 60 or 70 members; to-day they had over 500. The movement was not at all hostile to the operatives, whose interests the masters would regard as well as their own. Amongst the objects of the Association was the placing of the master plumbers on a better footing with regard to contracting work. They wanted a more adequate recognition of their position by architects. Then their relations with manufacturers and merchants require attention, as a large number of manufacturers and merchants were now supplying plumbers' goods to those who were not plumbers at the same price that plumbers had to pay. It was resolved to take counsel's opinion respecting the legality of the Sheffield corporation doing private trade. Birmingham was selected as the place of the next meeting.

The annual meeting of Scotch registered plumbers was held last week at the Philosophical Institution, Queen-street, Edinburgh, Sir James Russell presiding. The report of the District Council for Edinburgh and the East of Scotland was read, and in moving its adoption the chairman said it was a very satisfactory one. It would be found, he said, that the remuneration of the trade and the estimation in which it was held by the public, and the constancy of employment given to the best men, would be largely affected by registration. The question of registration had brought to the front the question of the education of the plumber. Having referred to the annual Congress to be held in Edinburgh this year, he went on to say that by getting Parliament to give power to the Local Government Board to frame model regulations, not only would a higher standard of plumbing be enforced all over the country, but those who might be inclined to break through the practice of instructed and worthy men would be pulled up very sharp. The Registration Bill was not making the progress in Parliament that he could wish; but he expressed the opinion that public feeling was increasing in favour of the Bill, and that ultimately it would be passed. Mr. J. Paterson seconded the motion, and the report was adopted. Mr. Thomas Hume moved: "That the town councils of Edinburgh and Leith be requested to petition Parliament in favour of the Plumbers' Registration Bill." Mr. George Blyth seconded, and the motion was unanimously agreed to; as was also a resolution, moved by Mr. Alexander Allan, to petition Parliament in favour of the Public Health (Scotland) Bill (No. 2), and in favour of the insertion of a clause conferring power on the Local Government Board regarding drainage and plumbing regulations.

## MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "Baroda Palace," by Robert Fellowes Chisholm, F.R.I.B.A. 8 p.m.  
Society of Arts. "Applied Electro-Chemistry," Cantor Lecture No. 1, by James Swinburne. 8 p.m.  
TUESDAY.—Society of Architects. "Peterborough Cathedral, and its Present Condition" (limelight views), by Canon Owen W. Davys. St. James's Hall, Piccadilly. 8 p.m.  
Society of Arts. "Bronze Casting in Europe," by George Simonds. 8 p.m.  
Institution of Civil Engineers. "Magnetic Testing of Iron and Steel," by Prof. J. A. Ewing; and "Magnetic Data of Iron and Steel," by Horace F. Parshall. 8 p.m.  
WEDNESDAY.—Society of Arts. "Ortho-chromatic Photography," by Capt. W. de W. Abney, C.B., F.R.S. 8 p.m.  
Carpenters' Hall Free Lectures. "Strength and Strains in Wood," by F. R. Farrow, F.R.I.B.A. 8 p.m.  
SATURDAY.—Edinburgh Architectural Association. Visit to St. Serf's Church, Ravenscraig Castle, and Kirkcaldy.

## The Society of Architects.

Founded 1884. Incorporated 1893.

THE SEVENTH ORDINARY MEETING of the Society of Architects for the Session 1895-6 will be held at the Rooms of the Society, at St. James's Hall, Piccadilly, W., on TUESDAY, MAY 19th, 1896, at eight o'clock p.m., when a paper will be read by The Rev. Canon OWEN W. DAVYS, entitled "PETERBOROUGH CATHEDRAL AND ITS PRESENT CONDITION," and illustrated with Limelight Views.

ELLIS MARSLAND, Hon. Sec.  
MONTAGU BALDWIN, M.A., Sec.

## CHIPS.

The memorial-stones have just been laid of a new Wesleyan chapel at Brimington, Chesterfield, which is to cost about £1,400.

The Manchester Corporation have purchased for their permanent collection "The Rock Tomb," making the third example they possess of the work of William J. Müller (1812-1845). They have also purchased a drawing called "The Trough of the Sea," by the late George Sheffield, making the second example of his work they have acquired.

The British Aluminium Company have arranged for the acquisition of certain water rights and the erection of a factory at Greenock, to be carried on in conjunction with the works at the Falls of Foyers.

On receiving instructions from the secretary of the Amalgamated Society of Carpenters and Joiners, some of the members of that trade who were working at the lunatic asylum at Mullingar went out on strike on Friday.

New board schools in High-street, Tunstall, Staffs, were opened last week. The buildings are two stories high, and give accommodation on the ground floor for 330 infants, and on the upper floor for 460 boys and girls. The frontage to High-street is faced with red pressed bricks and terracotta dressings. The entire building will be heated with hot water, supplemented by open fireplaces. The interior walls have glazed tiled dadoes and plastered above, and all the woodwork will be stained and varnished. A caretaker's house adjoins Woodland-street. The general contractors are Messrs. Yorke and Goodwin, of Tunstall, whose contract was £6,900. Mr. W. Sier has been the clerk of the works, and the work has been under the direction of the architect of the School Board, Mr. A. R. Wood, of Tunstall.

On Tuesday, May 12, in the church of Stillington, near Stockton-on-Tees, a new reredos was unveiled, which has been erected from the designs of Mr. J. P. Pritchett, architect, of Darlington. The design is in the Early English, or 13th-Century style, and consists of an arcade of seven trefoil-headed arches, richly moulded and carved in Caen stone, supported by shafts of polished pink alabaster, the whole being crowned by an elaborately moulded and carved cornice. The panels contain paintings of Our Saviour, in the centre, with Moses, St. Paul, and the Four Evangelists to the right and left. The mason's work has been executed by Mr. Dodds, of Melsomby; the carving by Messrs. Beall, of Newcastle; and the paintings by Messrs. Ward and Hughes, of London.

A new Baptist chapel at Stoke St. Gregory was opened last week. It is built of brickwork, with Bath stone dressings. Adjoining is a new Sunday-school, with a large room, an infants' schoolroom, and five classrooms. The total cost has been £1,500.

The opening ceremony of the Fanny Marshall Memorial Institute in connection with Gainsboro' parish church, built at a cost of £3,500, took place on Wednesday week. Messrs. Eyre and Southall, Retford and Gainsboro', were the architects. Mr. J. Fisher, jun., builder, of Gainsboro', is the chief contractor, and all the sub-contractors are members of All Saints' parish.



## Trade News.

### WAGES MOVEMENTS.

**THE BUILDING DISPUTES IN LONDON.**—The outlook for an amicable settlement of the dispute between the Metropolitan master builders, which at the close of last week looked very promising, has clouded over so far as three important branches of the trade are concerned—the plasterers, the carpenters and joiners, and the labourers. It will be remembered that a compromise was arrived at between the bricklayers and the employers, whereby the men agreed to accept an advance of 3d. per hour in wages as from May 1st, and a revision of rules, by which longer working hours for summer, and correspondingly shorter hours for winter, were arranged, together with the removal of Good Friday from the double-time list, and the concession of an extra 1d. per hour to night gangs. A clause provides for the harmonious working together of union and non-union men. A somewhat similar agreement has been made with the operative plumbers, but the halfpenny advance will not come into force until the 1st of August next. The plasterers, however, by a large majority, have rejected the similar terms provisionally agreed to by their delegates on Wednesday in last week, and continue on strike. The result of the ballot among the carpenters and joiners has been an overwhelming majority in favour of rejecting the masters' terms, and a still larger majority for coming out on strike on Monday next. The delegates representing the Amalgamated Society of Carpenters and Joiners, the Associated Carpenters, the General Union of Carpenters, and the Perseverance Society of Carpenters (representing some 8,000 men engaged in the London building trade) had an interview with the Central Association of Master Builders on Wednesday. The conference lasted from 2.0 p.m. until 7.30, and broke up without any settlement being arrived at, the masters insisting upon the insertion of a similar clause to that accepted by the bricklayers, providing for the harmonious working of union and non-union men. A strike on Monday is, therefore, now inevitable. The builders' labourers also continue on strike. They demanded a halfpenny advance and a revision of rates. The employers replied with an offer of a farthing rise, to which the labourers objected, proposing to accept a halfpenny without revision of rules; but, so far, this has not been agreed to. The London County Council decided on Tuesday to follow the current of trade movements, and to raise the wages of the bricklayers in the employ of the Works Committee from 9½d. to 10d. an hour.

**COLNE.**—The journeymen masons of Colne, numbering about 140, came out on strike on Monday. As in Nelson, their demand is for an advance from 8½d. to 9d. per hour. The masters have refused to give the advance, stating that the trade will not warrant it.

**GOOLE.**—The stonemasons in the employ of Messrs. Jackson Brothers, contractors and builders, at Goole, have come out on strike for an advance of a halfpenny per hour, the previous price being 7½d. per hour. The firm is at present engaged in the erection of the new market hall and other business premises in the main thoroughfare of the town.

**HUDDERSFIELD.**—An amicable settlement has been arrived at between the employers and joiners. The masters have agreed to an advance of 2s. per week now and another 1s. on July 13th. The men return to their work on Monday.

**KEIGHLEY.**—Having received no acceptance of their fortnight's notice of an increase wages from 7d. to 7½d. per hour, the Keighley plasterers removed their tools on Saturday. There is considerable activity in the Keighley building trade.

**MANCHESTER.**—A request was made recently by the journeymen cabinet-makers of Manchester for a reduction of hours from 54 to 51 per week, with an advance of 1s. in wages. As the result of friendly consultation between delegates of the workmen and the principal employers, an arrangement has been made that the week's labour shall be 48 hours, with the advance requested.

**ROCHDALE.**—The operative plumbers have applied for an advance of a penny per hour in their wages—an increase from 8d. to 9d. per hour being demanded. The men have also asked for certain alterations in their working rules. An adjourned meeting of master plumbers was held in the Technical School, Rochdale, on Thursday night in last week. Councillor Scotson presided. It was decided to form a local branch of the National Association of Master Plumbers. Councillor Scotson was elected president, Mr. John Tonge secretary, and Mr. Jas. Wild treasurer. The application from the employers was then considered. It was decided to adjourn the meeting for a fortnight to allow of the rules now in force locally being further considered.

**ST. ANNE'S, LANCs.**—The joiners' dispute was

settled at a meeting on Thursday in last week, by the men agreeing to give a six months' notice, at the expiration of which the masters are prepared to pay 8d. per hour instead of 7½d. as at present.

**STOURBRIDGE.**—A strike has occurred in the Stourbridge building trade. Twelve months ago there was a strike in the trade, which ended in an advance of wages from 7d. to 8d. per hour. On January 1 in the present year the members of the Stourbridge branch of the Operative Builders had notice from the Master Builders' Association of an intended reduction of a halfpenny per hour. A notice was sent by the Operatives' Society that they would not accept any reduction. The notice of the masters expiring on April 30, the members of the men's society are now out on strike.

**WEYBRIDGE.**—The carpenters and joiners of this town recently memorialised the employers for an advance in wages from 7½d. to 8d. an hour. After seeing delegates, the master builders have replied that they cannot accede to the request, on the ground that the trade rate of wages at Chertsey, Addlestone, Byfleet, and Shepperton is now only 7d. per hour, whereas a minimum of 7½d. is being paid in Weybridge, the consequence being that builders in neighbouring parishes already have an advantage in tendering for work. A second point is that the Weybridge employers have numerous contracts in hand extending over a considerable period, and one month's notice of a demand for higher wages is quite inadequate.

### CHIPS.

The amended plans of the drainage of North Featherstone, as prepared by Messrs. Hodson and Son, engineers, of Loughborough, the estimate cost of which is £7,360, have been approved by the Featherstone and District Urban Council.

On Wednesday next, the 20th inst., Mr. Frederick Herbert Tulloch, M.I.C.E., will hold a Local Government Board inquiry at Bootle Town Hall, with respect to the application of the town council for sanction to borrow the following amounts:—£1,500 for a concrete flag machine, £1,400 for the purchase of land at Pine-grove for a depot, £1,210 for the purchase of a refuse destructor, £1,108 for sewerage works, £808 for laying out an open space in Stanley-road as a public garden, and £239 for paving at Breeze Hill.

At the public offices, Egremont, on Friday, Mr. Rienzi Walton, C.E., Local Government Board inspector, held an inquiry into an application by the Wallasey District Council for sanction to borrow the sum of £20,565 for the provision of a marine park 3½ acres in extent at New Brighton, and the erection of a refuse destructor and stables.

A font of Mexican onyx, inlaid with red jasper, is about to be placed in St. Aidan's Church, Leeds. The columns are of Irish green marble, while the support is of bleu Belge marble. The font stands 5ft. high, and is 5ft. 9in. square. The centre panels are carved statuary marble representations of the four evangelists. The bowl has been cut out of a solid piece of rouge marble, its diameter is 3ft. 10in., and it alone weighs a ton and a half. The work has been executed by the Elswick Court Co., Newcastle-on-Tyne.

A new United Presbyterian church has just been opened at North Kelvinside. The church has been designed by Mr. John B. Wilson, A.R.I.B.A., Glasgow, and is built of Locharbriigs red freestone. The style is Late Decorated, a large seven-light east window and a series of rich traceried side windows of varied arrangement forming the principal features. The interior is seated with side and end galleries for 770 persons, but is roofed in a single span with an open timber roof and lined ceilings. The work has been executed by local contractors at a cost of about £5,000.

At the last meeting of the Glasgow Town Council, Lord Provost Sir James Bell said that some few weeks ago he was able to announce that the family of the late Lord Dean of Guild Reid had given a handsome donation of pictures to the city. Now he had to announce that ex-Bailie A. J. Macdonald, who retired from the Council in 1880, had acquired a valuable collection of pictures, which he wished to leave the city. Meantime he had signed a deed of gift, subject to the life-rent of himself and Mrs. Macdonald. The pictures were over fifty in number, and included works by Horatio McCulloch, Sam Bough, and others, and it was left to the President of the Royal Scottish Academy and the President of the Water-Colour Society to select the examples that they considered worthy of exhibition in the city collection. The Council accepted the gift, and expressed their cordial thanks to the donor.

The town council of St. Helen's, Lancs, have decided to raise the salary of Mr. S. Glover, gas engineer and manager, from £400 to £450 per annum, and afterwards by two annual increments of £25 each to £500 per annum.

Corner-stones for a new chancel for St. Mary's Church, Todmorden, were laid on Saturday. The present edifice has been a centre for public worship for at least 400 years, and the new chancel—the first portion of a scheme of reconstruction—will cost about £2,000. The east window is of three lights of stained glass, and forms a memorial to the late Mr. John Fielden, Dobroyd Castle and Grimston Park. It is hoped eventually to erect a new nave.

A memorial window has been placed in St. James's Church, Swarkestone, Yorks, by the Hon. Mrs. Alexander to her late husband, the Rev. C. L. Alexander. The subject of the window is "The Good Shepherd," and it was designed and put in by Mr. C. E. Tate.

Owing to some scaffolding giving way at Ham Hill Stone Quarries, near Yeovil, on Saturday, one man was killed and two others were severely injured.

The new bridge which has been erected across the Union Canal between Yeaman-place and Polwarth-crescent, at Edinburgh, will be opened for traffic within the next fortnight. It is a steel girder bridge 40ft. in width, and replaces a 12ft. stone structure. The carriageway is 28ft. wide, and is laid with wooden blocks, while the granolithic footpaths are each 6ft. in width. The cost of the bridge is about £1,500, of which £1,000 was voted by the Edinburgh Corporation, the remainder being borne by the proprietor of the ground in the vicinity. Messrs. James Young and Sons, Edinburgh, were the contractors for the work, which was carried through by the city roads department.

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### TENDERS.

\* \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**BILLERICAY.**—For the erection of an entrance lodge, stables, with coachman's cottage, alterations and additions to a residence at Ramsden Heath, Billericay, Essex, for Mr. Arthur Helsham Jones, J.P. Mr. Arthur T.G. Woods, M.S.A., New-road, Brentwood, architect:—  
Hammond and Sons, Romford ... £2,548 0 0  
Burtwell and Jarvis, Brentwood ... 2,512 0 0  
Brown, A., Braintree ... 2,485 0 0  
Rogers and Robson, Brentwood\* ... 2,350 0 0  
\* Accepted.

**BOSTON, LINCS.**—For the supply of desks, &c., for the new board schools:—  
Bennett Furnishing Co. (accepted) £443 0 0



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2159.

FRIDAY, MAY 22, 1896.

### WHY ARCHITECTS NEGLECT COLOUR.

"WHAT chances these architects throw away!" That, more than anything else, is the point about us which impresses artists, both professional and lay. No doubt they are largely blaming us for other men's sins. They think that everything which pretends—worthily or unworthily—to be architecture must have had an architect. They do not know what a very small percentage of the buildings in any town really proceed from a qualified designer. Taking them all together, large and small, perhaps one in fifty may fairly lay its credit—or its discredit—at an architect's door. For the rest, we may thank the speculative builder or the surveyor-of-all-work. The public—even the artistic public—do not realise this. Yet even when we have made the immense deduction from our supposed failures which this implies, we can well understand that we seem to be perpetually wasting opportunities, and there is no direction in which we appear to waste them more needlessly and more constantly than in that of colour. Mr. Whall told us this in his very suggestive paper, read at the Institute two or three weeks ago, and on certain points he made out his case: architectural colour is needlessly, inexcusably bad. But much more is bad from the very conditions of the case, and its badness exasperates nobody more than the architects who are supposed to be responsible for it.

Take the case of a young architect with a real instinct for colour; to whom the love of it is a nature, while the love of form is, in comparison, little more than an acquired taste. There are such men, even in England; and if the sight of an average office does not warn them off in time, they may sign articles and be started in the profession. Say that one of them has emerged from the tunnel of a three or four years' apprenticeship, has passed through the cutting of improvership and clerkship, and has at last come out into the open with an office of his own. He is full of ideas and enthusiasms. The world's his oyster, which, with his brush, he'll open. There could hardly be a more unsuitable instrument. A client arrives—some friend of the family—who, with a mind divided between benevolence and fear, intrusts him with his first commission. He is going to build a house. He and his wife have drawn a plan of it between them, just as they want it. At this point the sketch is produced, and it shows a building worth about £150 a year. It is to be of red brick, with green slates, as large and as thin as possible, and, above all things, uniform in colour. It must not cost a penny over £1,000, and there must be no extras. "And now," the client concludes, "as you are a young man, and have had hardly any experience, you will have to be guided in everything by the opinion of Mr. Compo, of Portland-street, who is going to build it. I shall take his advice whenever I am in doubt, and mind you look after him properly, and see that he builds it well." We need not pursue our architect's first work much further, nor inquire whether it gave him the chance he was looking for of producing that thing of beauty which is a joy for ever.

He turns next to open competitions. The young architect generally does. Perhaps his grasp of the doctrine of chances is but feeble, and since it is clear that he either will or will not win the competition, he thinks himself as likely to do the one as the other. He

writes for the conditions. A large portion of them consist of the promoters' instructions as to where the rooms, and entrances, and staircases are to be. The ingenious gentlemen who were managing the concern found within themselves a vein of architectural talent too precious to be wasted, and they bestowed its results gratuitously on the competitors. Well, one man's work is another man's play all the world over, so that to the local bigwigs, from the family solicitor to the prosperous butcher—who thinks his meat may fairly be sold as English if it comes from "Greater Britain,"—it is as good as a game at cricket to meddle and muddle about the arrangements of the future town hall. But they are sharp men of business for all that. They do not intend to be taken in, and though they have appointed the local surveyor of roads their assessor, they do not intend that he shall be taken in either. Now there is one thing, they have always been told, which will deceive a competition committee and mislead a surveyor of roads, and that thing is colour. If they only keep this accursed thing from their eyes, the butcher, and baker, and candlestick-maker will decide wisely and well, assessor or no assessor; but if they once admit it, even to tint the floors in the ground plan, they are but lost monsters, every one of them. Besides, who wants colour? What has a staid, respectable building to do with such vanities, and what can anybody wish for beyond white stone for the front, and blue slates for the roof? That, at any rate, is what they mean to have, and they would like to see the architect who will persuade them out of it. As for the drawings, they shall be in Indian ink, with the elevations in outline. Much chance here for an architect, if colour is his strong point!

The ignorant prejudice of the public accounts in this way for a large part of the "neglected opportunities," which to the architect were never really opportunities at all. The people love to have it so, and we, who as a matter of course get all the blame, can do little to influence them. But it does happen sometimes, though rarely, that good colour is in demand. Clients want it—or think they want it—and yet they do not get it; and why? Simply because they will not pay the price. It is not always a price in money. Very often it is a price in time, or in trouble. The client, when after needless delays he does begin to build, is nearly always in what a sufferer from his caprices once described as "a jackass hurry." He expects the architect to sit in his office, and before the contract is signed, to "prophesy everything." If our poor young man takes Mr. Whall's sound and sensible advice, and resolves to settle all the colour of his decoration in the building itself, after that building is nearly finished, the client will not be slow to conclude that he is incompetent. "Sir Dewitt Wholesale, when he restored, or I might say rebuilt, our grand old parish church, wanted none of this nonsense. He showed all his colours on the working drawings, and they were signed and stamped as part of the contract. He knew what he was going to do, and did it; yes, and in time, too." Woe to the young architect if he ventures after this to learn anything by trial or experiment. He is in one of the many situations in this life, in which a man must either be a fool or thought one. He will be a fool if he puts up the colour he first intended, after seeing clearly by tests on the spot that it will not do; and he will be thought one if he gives up his first crude fancy, and learns all he can from the teaching of facts.

On the whole, every client gets about what he deserves, and the difference between one architect's work and another's depends much more largely than is supposed on the class of people each has to work for. The lucky man who, partly from ability and partly from influence, gets one great church or country

house after another, has the conditions in favour of him. His clients, though they may have their whims, have lived and travelled amongst beautiful things. They may make mistakes; but the worship of ugliness is not a religion with them, as it is with the lower middle classes. The architect whose unhappy lot is cast there, finds his life an incessant fight. He is like a white man in laager, with a surging sea of barbarians round him. Perhaps he set out in youth with the idea of converting the barbarians. He saw that of all men they were most in need of it, in an artistic sense, and he had visions of making their desert of chapels and lecture-halls, of Sunday-schools and mission-rooms, blossom like the rose. But that is the last thing they wish for. They are satisfied with their surroundings as they are. As a man of genius said long ago, they do not want to transform themselves; they only want to improve themselves. They have no thanks for anybody who tries to civilise them, and if burning had not gone out of fashion they would probably dispose of him by fire and faggots.

The chances of the architect with a passion for colour, then, lie amongst a very small class. Let us hope that there, after long years, he obtains his opportunity, and makes the best of it. How can he get another? How can he go on in the right road, now that he has at last managed to enter it? It is not likely that he entered it with a great flourish of trumpets which made all the world look round and notice him. He was not commissioned to decorate St. Paul's, or to complete the Palace of Westminster. He had his beginning, as was fitting, in some work of modest size, which, perhaps, was little heard of beyond its own locality. That work, very likely in an out-of-the-way place, and too unimportant, in editors' eyes, to be even named in the daily papers, is really the only thing which he can show by way of introduction to another. How is he to show it? It is hard enough for any architect to show what he has done. With the people who can go and see his building, there is no difficulty; but to all the others he can only offer some lines or tints on paper. But the architect whose *forte* is colour cannot even do as much as this. It is true he can make a colour-sketch, and send it here and there; but he cannot multiply copies of it, or put into the illustrated papers, or into the architectural journals, as the artist who relies on form can. Therefore he remains unknown, and being unknown, he has but few and poor opportunities of using his powers. He lacks the practice which makes perfect. The gift that is in him remains half-cultivated. He may be able enough, but his colour-faculty will never make him a career. After wasting years in finding this out, he commonly does one of two things: either he ceases to be an architect, and trains himself as a painter or decorator of some kind; or he gives up the serious study of colour, and devotes his attention to form and planning, and the things that "pay." Who can blame him?

Mr. Whall says, rightly enough, that architects need to be got out of their offices—meaning, no doubt, on to their buildings. Those of them who deserve the name would be only too glad to go, if they were only free to do some good when they did go. But, as it is, the wretched contract system ties them hand and foot. The public and the lawyers, putting their heads together, have decided that it is the duty of an architect to settle every detail in his building before that building is begun. It does not matter to them that to settle it so is to curse it at its birth. They appoint an architect to "superintend" the work, and they so define his superintendence that he has no power of setting things right even when he plainly sees them going wrong. They force him to state his first vague ideas about an infinity of matters which can only be rightly settled by watching



and closely observing effects as the building goes up, and then they bind him down for ever to these first vague ideas. He has to make his plans and his specifications and his details before a brick is carted or a trench is dug, and then these plans and specifications and details become to him like the laws of the Medes and Persians, which alter not. Naturally, therefore, his buildings are full of eyeshores and failures and discords, not in colour alone. Nobody else sees them so plainly as he does, or worries about them so much. And he could so easily have prevented them if he had been—like the great architects in other ages—a free man, and not the slave of a contract. As it is, he may well sit in his office, for it is heartbreaking to be at his buildings, to know that he could save them from faults here, there, and everywhere with a word, and yet to be forbidden, by the ineffable folly of his age and country, from speaking the word that is required.

All things are bound together, and depend one upon another. Darwin showed long ago how the spread of white clover in a district might depend largely on the number of cats there. White clover spreads by seed. It does not go to seed unless its flowers are fertilised by insects, and in England the bumble bee is the only insect which can reach and fertilise them. Field-mice are the bumble bee's worst enemies, since they destroy its nests; and cats, of course, keep the field-mice down. So the spread of good colours in buildings depends in the last resort on the rise of anybody or anything who will put down the contract system, and give the architect time to observe and think. Why should it not be put down? Architects worth the name do not like it. Workmen worth the name do not like it, nor builders either. If the public like it, it is because they do not know what they lose by it, and they will never get value for their money till they go back to the honest old style of a fair day's wage for a fair day's work.

#### WHAT TO SPECIFY.

**P**ROBABLY no one is a greater "slave of habit" than the ordinary specification writer who attempts to describe his building miles away from the actual district and beyond the touch of materials and workmen. The set phrases about the quality of brick and stone and timber may sound like business, but they have scarcely any meaning in them; the rest is like filling up the blanks of a printed form. Just the opposite way the old builder set to work. He found his materials first, and then tried to see how he could use them. The instructions were given verbally while the building was progressing, the quarryman and mason both contributing their experience. As situations and circumstances alter cases, so the instruction which suited a building in one stone district would be unsuitable in another place. The present system is the reverse of this: to prescribe materials for a certain building, to select them for appearance, or because they have been used for other structures. The question is not What are the available materials, and how can they be adapted?

What to specify means a great deal more than is generally thought. It is not merely raking up a number of catalogues, making a list of specialties or fittings. It does not mean looking over an old specification as an aid to the memory. A fundamental knowledge is required of certain things. The architect must not only supply those things which he thinks are required or which his client wishes, but he must also have some acquaintance with things which are in the market. He must not only be sure such and such a thing is wanted, but must be certain it can be procured, where, and how. It is of little use, for example, to specify a particular

stone or marble which is not quarried or cannot be obtained. It is, therefore, essential first of all that the architect should have a knowledge of materials and markets. We see him sometimes poring over the pages of his Laxton or his Lockwood—excellent helps, no doubt, for those who wish to learn the trade price of materials or labour, but of very little use to a man who is going to build in a certain locality, and who wants to know something about the most desirable material for walling or the most economical kind of construction and labour. When we come to think of it, a great many of our most charming rural and suburban localities are ruined by the thoughtless specification! How is this? A London architect is employed to build a number of farm cottages in a place where local stone is cheap, say in Sussex or Somersetshire. He knows there is a stone to be had that can be worked cheaply, but perhaps that is all. He looks through his price-books, but he sees nothing about it, and if it is mentioned the local way of using it is not described. He sits down and writes his specification from his London knowledge or experience; but he finds, when all the plans, specifications, and quantities are prepared, and the work is commenced, that he might have done something better and cheaper if only he had made inquiries in the district. He did not know anything about the "cob" work of Somersetshire in which the cheaper agricultural cottage buildings are built of mud mixed with straw, or the flint and stone work of Sussex. If he had, he might have made his cottages much cheaper, and not only so, but given to them a local character of their own which would have harmonised better with the surrounding landscape; or suppose he had to write a specification for a residence in Hertfordshire or Surrey, where weather-boarding and half-timber work with or without brick is used. An architect practising in London or some of the Southern counties would not know much about the requirements of half-timbered work or weather-boarding, though he might know a good deal about brickwork and slating, and his specification, if carried out, would seriously mar the effect of his work. Nothing is more disastrous than to use materials which are foreign to the neighbourhood, and where, if local workmen are employed, the workmanship cannot be satisfactory. Varieties of building stones and bricks, details of construction such as "post-and-pan" work, weather-boarding and half-timbering, iron and wood construction are not matters that interest the young architect beyond being able to specify them, or show them on his drawings and sections in a general sort of way. What to specify implies a knowledge of the market qualities, for instance, of bricks and timber. The examination questions put to candidates in the Science and Art Department, the Architectural Association, or in other examinations do not qualify for this purpose. To take one or two instances. One question put is, "What description of timber would you recommend for common wood flooring and window sills?" For the former it may be answered, Swedish or Norwegian yellow or white deal; for window sills, oak; but these statements are insufficient, when we come to consider the various ship-memals and qualities. In some situations Memel or red pine is better than oak for outside sills, as being less liable to split or warp; and so on through the various trades it can be shown that cut-and-dried answers to questions are misleading where so much must be left to judgment or to those marketable qualities which can be obtained. Where, for instance, the architect knows the varieties of timber or stone which can be procured, he can specify that one sort or quality which he has found to answer the purpose. In short, the specifier of ideal qualities is often more vaguely wrong than he who understands the

market, and selects the best available material for the purpose. Hence it is the practical man so often does better than one steeped in all the literature of building construction and formula. He knows where to go, while his more learned brother in the craft contents himself with specifying what ought to be got, but cannot.

A knowledge of building requirements is another condition. "What to specify" implies a knowledge of what is wanted, or what is the best for the purpose, and here, also, the average architect follows very much on the beaten track. He takes the ordinary specification to help him, or makes inquiries of those who are secretaries or officials, or pays personal visits to buildings of similar kind—all very excellent ways of obtaining information; but after all, the information is second-hand, and there is such a thing as prejudice and self-interest that becloud truth. Mr. Brown goes to Dr. Wrinkle, who is the director or manager of a technical institute, to ask him his advice and experience as to the requirement and fitting up of a laboratory, and Dr. Wrinkle refers him to a treatise on the subject written by himself, and also to the well-known firm of laboratory fitters, whom he recommends in the same book. Is it at all unlikely that Dr. W. has pledged himself to recommend the said firm? Mr. Brown receives a prejudiced opinion, but it answers his purpose and he specifies accordingly. This is how the average specification is written. Every material and fitting that the architect has not a personal acquaintance about is written by recommendation. The advertising firm, the interested committeeman, the contractor who is anxious to obtain a commission, are all at the elbow of the architect; but, after all, this does not answer the question What to specify. Only by hard and unrelenting study and personal inspection of the best buildings of its class can the architect succeed in describing and specifying the right things. Thus, for chemical and physical laboratories, the architect cannot do better than visit such technical buildings as those of Zurich, Munich, or Berlin, or nearer home, the colleges at Leeds, the Owens College, Manchester, the Yorkshire College, Leeds, and the Merchant Venturers, Bristol, in any of which he may learn something about the planning and requirements of laboratories for the teaching of physics, chemistry, or engineering, &c.; the details of tables, draught closets; the basements for boiler, engine furnaces, hydraulic appliances; the machine-room in which such things as testing machines and various tools for drilling, planing, milling, &c., are to be provided. Incidentally to these, substantial foundations must be provided to support the heavier ones, such as the column of the testing-machine and the beds and benches for the lathes for screw-cutting and other operations—details that have to be specified with care. So with lecture-rooms, accommodation has to be provided for a certain number of students and benches, and these must be described, and the mode of lighting (generally being from the north and on the student's left). The engineering lecture-room has to be fitted with desks and drawing-boards for small sheets of paper, blackboards hung to move up and down, and other fittings. The heating and ventilation of these buildings require particular knowledge. Sometimes they are heated by steam, fresh-air inlets being arranged on the different floors, the air passing through steam-heated coils or boxes at each window-back. Then, for operating the machinery, steam has to be laid on to the workshops and laboratories, evaporating and drying closets. In hospitals, baths, and washhouses, the architect not conversant with details, and fittings and engineering apparatus, has to rely a great deal on others, so that his specification becomes in many cases a list of the opinions of nurses, medical men, and



apparatus engineers, though much that is valuable and practical can be obtained in this way. We do not believe in copying forms of specification for buildings of a like kind; these are sure to mislead, as well as to lead to trouble if any clause is thoughtlessly inserted which does not apply to the work in hand. In short, the knowledge of building requirements is co-extensive with construction in every branch, and of all those varied uses for which the architect designs. Only a few experts can master them.

Thirdly, and lastly, the client's views have to be consulted. Who has not experienced the difficult task of stifling one's better judgment by having to give way to a self-opinionated client on some point of detail or decoration. Mr. Brown insists on coloured brickwork "tuck-pointed," Mr. Jones on polished imitation marble to hide the iron columns in his shop, Mr. Robinson to cast-iron mantelpieces and overmantels. It is extraordinary how, in matters of artistic design and decoration, where culture and taste are supposed to enter, the average Philistine is so self-willed and aggressive. He does not trouble so much about drainage or about construction; but he intrudes his notions about those parts of the design which the architect had hoped would have been left to him: the plan, the materials, and the decoration. Woe to the aspirant to Georgian simplicity who would emulate the style of Gower-street or Southampton-row; the speculative or commercial owner will have none of it. Quite as objectionable is the stubborn man with a fad, who entertains some stupid whim: a conservatory on the roof, or a new scheme of ventilation which is an eyesore, or a new kind of decoration which is defiant of every principle of good taste. It requires considerable tact to deal with people of this sort. It does not answer to insult them by telling them they are wrong, or that their tastes are vulgar; it is a mistake to thwart them at first; the better and safer way is to try and conciliate them by argument and example, and if persuasion cannot avert, compromise may.

#### EXTERNAL AND PARTY-WALLS.

A POINT of considerable importance to builders and owners of property in London was decided in the Queen's Bench Division the other day—namely, whether a wall built to divide two portions of a warehouse, one part of which was five stories in height, and the other part only one story, was a "party-wall" above the line where it ceased to divide the two buildings? The facts have already been reported in our columns. The case came before a Metropolitan magistrate. The defendants, the Army and Navy Stores, were summoned under the Act, sections 75 and 59. They had erected a building of the warehouse class of the capacity of 657,408 cu. ft. divided by two party-walls, one portion of which, as we have said, was five stories high and the other one story, the latter portion being lighted by a skylight. The wall between these portions was admitted to be a party-wall; but the defendants claimed that the part of the wall above the first story was not a party-wall, and that they were at liberty to make windows in it without regard to the provisions referring to party-walls. The magistrate refused to convict under the summons. On behalf of the district surveyor it was contended that the whole wall was a party-wall under section 59. The section says, "Every party-wall shall be carried up of a thickness in a building of the warehouse class equal to the thickness of such wall in the topmost story above the roof-flat or gutter of the highest building adjoining thereto to such a height as will give a distance of at least 3 ft. measured at right-angles to the slope of the roof." It was also argued that an external wall could not be built on a party-wall, because there

was a rule which provided that an external wall other than a wall erected on a bressumer should have footings as prescribed. The Court decided that the magistrate was right, that the definition of the term "party-wall" (section 75) was not used in a technical sense, and they ruled that section 59 meant that, so far as a wall was a party-wall, it should comply with that section, and that there was no presumption that a wall, which was a party-wall as to a portion of its height, should be one as to its whole height.

As it appears to us, the question turns on the meaning of "party-wall," and not so much on section 59, which refers exclusively to the height and thickness of such a wall. The plaintiffs seemed mainly to hang their argument on the last section, assuming that the wall in question was a party-wall; but the Court decided otherwise—namely, that the wall was a party-wall only up to that portion of its height which divided the two sections of the warehouse, above which it was presumably an external wall. And by referring to the definitions of party-wall and external wall, there does not appear to be anything in them which is contrary to the decision of the Court. There is nothing, for instance, to contradict, that one wall which in part separates adjoining buildings and partly becomes an outer wall of inclosure, may not be both one and the other. So it seems is the meaning implied in Lord Denman's remarks in "Green v. Gates." Still there is just an excuse for a question to arise. The definition of "external wall"—"an outer wall or vertical inclosure of any building not being a party-wall"—is likely to be misunderstood; at least, the last words of the clause, "not being a party-wall," is likely to be understood that the two cannot be included in one wall, whereas the words do not imply so much, and, in fact, according to recent decisions, "party-wall" may be included in the term "external wall." The case of "Knight v. Pursell" seems to make clear this view. The Court then decided that it was "only so much of a wall as had buildings on each side of it that was a party-wall within the meaning of the old Act of 1855." The judge said it was a question of user, not of title. But apart from the legal meaning, the question is of moment to the profession. A number of buildings are erected divided in the manner described, where one portion is of a height of several stories and the other of only two or only one story, but both of them in the same occupation. Many large warehouses are so built: the lower part is lighted by a skylight, and the architect often finds it necessary to open apertures or windows in the wall which overlooks the lower portion, to light an area, or landing, or rooms. In this sense, the wall so used is an "external wall," and not a party-wall. It might be argued that if a fire occurred in the higher portion the lower building would be endangered, and therefore the wall should be imperforate. The argument is not worth much if the lower roof is well constructed. On architectural grounds it is expedient that the same wall may be used in the dual capacity of a party and an external structure, so that our huge street buildings may not be all disfigured and rendered eyesores by gaunt and unbroken walls. It is a great convenience to be able to divide portions of buildings which are in excess of the 250,000 cu. ft. limit provided by section 75, by walls which are impenetrable by fire, and to carry up the same walls as external walls above the roof of the lower structures. The whole question which has been so far decided, is whether the owner or builder of premises is debarred from making windows in walls which are not, properly speaking, party-walls of division between buildings "belonging to different owners." The effect of such a law would be to limit considerably the means of obtaining light in buildings of

great depth by restricting all openings to the front and rear. There are certain advantages, no doubt, in having imperforate walls at the sides of a building. One is that in case of a division of ownership, or the disposal of one of the parts so divided, the wall of separation could be left intact, and in street buildings there is a merit in solid walls abutting against lower premises. The legal question is one that will continue to give trouble to builders and architects. The sections of the Act bearing on party and external walls have been continually discussed by the magistrate and by the Courts; but their decisions do not appear to have finally settled the matter. Under the amended Act, the clauses are still open to doubt. The authorities are anxious to insist on the technical interpretation of section 75, and to take, as far as they can, the view that a party-wall extends from foundation to roof. On the other hand, the owners of property and the builder have put a different meaning on it, and one that seems to be supported by a commonsense application of the distinction as laid down in the definition in the Act itself.

#### THE SOCIETY OF ARCHITECTS.

THE seventh ordinary meeting for the present session of the Society of Architects was held at St. James's Hall, Piccadilly, S.W., on Tuesday evening. The President, Mr. Edwin J. Hamilton, of Brighton, occupied the chair. The following six architects were elected by ballot as members:—Henry Charles William Blyth, 125, Horning-lane, street, Burton-on-Trent; Herbert Edmondson, 38, College Grove-road, Wakefield; Frederick John Ing, Walton House, Swindon; Anthony Scott, 16, William-street, Drogheda; William Squire, jun., Tavistock; and Henry Alfred Whitburn, Elm Croft, Woking.

#### PETERBOROUGH CATHEDRAL, AND ITS PRESENT CONDITION.

The following paper on this subject was read by the Rev. Canon Owen W. Davys, of Wheat-hampstead. The lecture was illustrated by lantern-views shown by Mr. G. A. T. Middleton, including several sketches photographed from early issues of the BUILDING NEWS,\* and duly acknowledged by the author of the paper:—This cathedral, to some portions of whose ancient and modern history I am to have the honour of drawing your attention this evening, has shared with not a few other great ecclesiastical buildings of late an unenviable notoriety, for its custodians have been driven to revive the uses of the Mediaeval mendicant orders in having to beg hard for money for its preservation. But before I enter upon its present condition, I must ask your attention, in order to explain it the better, to some points in the ancient history of this cathedral. I must give but a sketch of this most interesting subject. Those who would do me the honour to ask for more I must refer to my (little) book on the cathedral, especially its last and sixth edition, which brings matters more nearly down to the present date. In order, then, to understand the arrangements of this noble church aright, we must remember that its history as a cathedral began under Henry VIII., it being one of what are called his "Neo Cathedrals," and that its more ancient and constructive history is that of a great Benedictine church, and that we must look for its companions at Westminster and St. Alban's, for these noble cathedrals ranked among the chiefest of those great monastic establishments in England. I had the great privilege some years ago of accompanying Professor Willis and Canon Stewart in a very careful survey of the remains of this great

\* The following illustrations of Peterborough Cathedral have appeared in our pages:—The Benedictine Monastery, ground plan (by the late Mackenzie E. C. Walcott), July 5, 1878; cloister and close plan (also by Mackenzie Walcott), Feb. 8, 1878; sketch of Cathedral from the Market-place (by Joseph Pennell), Feb. 10, 1888; ditto from the north-east, showing north transept, central tower, and north side of nave (by Maurice B. Adams), January 26, 1883; west front (by Edwin G. Hardy), February 24, 1882; north-west transept and towers (by J. Cox), April 29, 1870; interior of transept (by the late Viollet-le-Duc), December 19, 1873; half-section and half-elevation of central tower, Jan. 26, 1883; pinnacle of south-west transept (by Alex. Payne), Feb. 21, 1868; plan of spire on south-west tower, May 29, 1895; and Mr. J. L. Pearson's cenotaph to the late Dr. Magee, Archbishop of York, Oct. 13, 1893.



monastery, and at the end of my book will be found a copy of a plan of this building, which was then laid down, Professor Willis remarking at the time that, next to Canterbury, he had never found such remains more perfect. Many are still to be seen built into the houses of the canons, of which the most remarkable are the stately arches of the infirmary, built by Abbot John de Calits (date of appointment 1248), being a noble example of Early Geometrical work. I mentioned St. Alban's Abbey as a church for comparison, and its internal arrangements, happily still maintained by the preservation *in situ* of its screens, its noble choir, and high altar, have proved a valuable authority in the restoration on its old lines of the choir at Peterborough. But both at St. Alban's and Westminster exceptional features occur in the feretory chapels behind the high altar. Externally, however, comparison between St. Alban's and Peterborough, though their general arrangements have certain points in common, fail through the great difference of effect produced by the materials used, St. Alban's being largely built of Roman bricks from Verulam, mingled with local flint works, while at Peterborough the quarries of Barnack furnished one of the finest building stones ever employed for ecclesiastical purposes; we may note, too, the Lady Chapel at Peterborough, now destroyed, was on the north of the presbytery, as at Ely, while at St. Alban's it followed the more common plan of an eastern extension King's Picture. I will now ask you to follow me in a brief history of the ancient building works here. The Saxon Church, of which some remains were recently discovered, having been destroyed by fire—the Norman Abbot John de Sais (or Seez) began a new church in 1117 A.D., and began at its eastern or great choir at the altar end. His lofty apsidal termination remains unaltered in plan, though with inserted windows and tracery of the Decorated period, and with its stately and elegant pinnacles is the most perfect fragment of a great church which we have remaining of the Norman period, for though there were doubtless many in England once, the advance of Art led either to great alterations of superstructure, as at Norwich and Tewkesbury, or to an entire demolition and extension, as at Lincoln, Ely, and York. The aisles of De Sais' presbytery ended in apses also; but these were squared out by his Early English successors, and the whole surrounded in Perpendicular days by the magnificent new building of Abbots Ashton and Kirkton. Let me remark, in passing, that this beautiful addition contained five altars beneath its five east windows; that it was vaulted with fan tracery, considered by Prof. Willis to be the finest in England; that figures of the Apostles, like those on the great mediæval Bridge of Prague, formed its pinnacles; also, let me add, that it was constructed of Weldon stone, showing that the quarries of Barnack, after having built innumerable structures of infinite variety, and having been carried—at least, as far as the great monastery of St. Edmund's, Bury, had at length been exhausted. We are indebted to the destroyed Lady Chapel north of the presbytery for the preservation of a portion of the external E. elevation of the N. transept, which, by abutting against it prevented alteration here. John de Sais probably completed the presbytery and its aisles, and was proceeding with the transept at the time of his death, when his work was taken up by Abbot Martin de Bec, 1133, and continued by William de Waterville (date 1154), who seems to have finished the very noble transepts and the central tower of three stories, according to the chronicler, and carried out so much of the construction of the nave, as would not only form a close abutment to the great tower, but complete the ground plan of the monastic choir. Whoever was responsible for the foundation of the piers of what must have been one of the finest towers of the period, he unfortunately did not build his tower upon the rock, but satisfied himself with the levels of the old Saxon Church, thereby causing infinite trouble to future generations. I may here note that when the present tower was taken down and rebuilt a few years ago, it was found that the old stones from the Norman tower had been used and reworked, for they showed behind the Decorated details the old Norman carvings, which led to the conclusion that this tower was a companion in arrangement of detail of the present east front of the transepts. Benedict, Prior of Canterbury (date 1177), on his promotion to the government of this abbey, constructed the present nave, which he proposed to finish with western towers, of

which evidences are found in the second north bay from the west, and his design might have included a large central arch as at Tewkesbury. Whether this was ever completed is very doubtful, though the chronicler describes Benedict's extension *usque ad portam*, for another mind and hand here took up the work, first carrying Benedict's work in the original outline of its elevation two bays westward and designing a western transept, to give greater breadth to a new front. It is vexatious to find that at this remarkable western transept—an interesting study and ingenious puzzle to the architectural student—documentary evidence of the progress of the building ceases; it is a most interesting example of Transition work, with arch mouldings that remind us of Glastonbury, and with its imitations of Earlier work, and insertions of Later, may well keep an inquirer busy for a long time. Its western wall is of purer Lancet work, and its fine north-west tower, which, happily, in its completion, which was for some time delayed, is the recorded work of Richard de London, with its southern still uncompleted companion, has been designed to dominate the original elevation of this front, which, with its three noble doorways, opening into their several aisles, its windows, archways, and general ornament, must have been considered a very noble composition. Whether the smaller angle-staircase towers formed part of this architect's design has been a subject of inquiry, and I agree fully with the opinion that they did, though that builder does not appear to have carried them up very high; the front then would have had projecting angular towers, as at the west front of Holyrood Church at Edinburgh, which would greatly have assisted its stability. These towers, therefore, we may believe to have been in progress, though in an incomplete state, when, according to Mr. Britton's opinion, borne out by subsequent investigations, a great ecclesiastical artist arrived in the year 1200 in the person of Acharis, Prior of St. Albans, now promoted to the Abbey of Peterborough. He had seen the beautiful porches of John de Cella, and doubtless had admired the design on paper of one of the most remarkable E.E. fronts intended for erection in this country, and being seized with an ambition to outvie it, if possible, conceived the idea of exalting the St. Alban's porches into the Peterborough arches, and carrying up between the projecting towers which he found building a magnificent front, the noblest in the kingdom. Alas for the vanity of all human conceptions! Acharis, like John de Cella, was an exquisite artist, but no engineer. His front (if we are right in so considering it on architectural evidence, for no actual record of its date has apparently survived the burning of the records of the church by the Puritan soldiery) fared better than that of St. Alban's, for his design was carried nearly to completion, which its Hertfordshire rival never was; but it was not long before the laws of gravitation and pressures asserted themselves, and those who followed had to support his work by a mechanical appliance remarkable in itself, and laying subsequent generations under a vast obligation in sustaining the majestic arches and their gables above. I, of course, allude to the later porch and library within the central arch of the front. We have been all greatly distressed to hear that this noble front, which has been so well described by an eminent writer as "the finest Gothic portico in the world," has shown signs of late of a certain amount of danger; and we must be greatly relieved to find, from the report of the distinguished architect in charge of it, that no serious settlement has taken place since the porch was built. Indifferent foundations, again, are discovered as trusted by the E.E. builders, while the builders of the porch raised on it a strong buttress 40ft. high, and skilfully inclined at such an angle as not to show too severely the unfortunate leaning of the great piers, and carried its foundations down to the rock. It is satisfactory to gather from Mr. Pearson's report that only a strengthening of foundations, a careful removal of the stones of this front where perished, a filling up of gaping joints, and the repair of failure in raised details, are sufficient to meet existing needs, and that any serious structural movement beyond what must have occurred long ago is not to be dreaded. Of course, all dealings with so precious a possession must be of the most careful and loving nature, and cannot be accomplished without much cost of labour, time, and money. This undoubtedly is the great point of interest at the cathedral now. A work of great costliness, and one which led to much

debate at the time, was the rebuilding of the central tower. The Norman tower, which was a very heavy one, became so unsafe during the Decorated period, that to avoid the wreck which its fall would have occasioned, and possibly warned by such catastrophes elsewhere, it appears to have been taken down at a time not much before the building of the western porch, though here again we have no record. The convent at this time must have been in much anxiety; the monks in the choir were in danger of having their great tower on their heads, while their magnificent front was falling only too surely outward; and self-preservation seems to have demanded attention to the tower first. It must have been with feelings of much sorrow that this imposing tower had necessarily for its substitute an apparently poor successor; but an effort of mechanical skill in its remarkable lightness is conspicuous. The Decorated reconstructors designed a short lantern, rebuilding beneath it the western and eastern arches of the crossing, not apparently venturing to go to the root of the evil and underpin or rebuild the piers on which they placed them. This short lantern was crowned with a lead octagon, however, to make it look its best on a still unstable foundation, and so it remained till the beginning of the present century. Mischief, however, progressing, to lighten this lantern somewhat, it was uncrowned, and to save appearances four tall turrets, oddly composed after the pattern of an elongated edition of the turrets on the transepts, were erected at the expense of the Dean of that day, Dr. Kipling. Those turrets have not now been reared, but the substructure and its Norman abutments have been rebuilt from the rock, the Decorated lantern having been replaced as nearly as possible stone for stone. The effect of this tower, it must be allowed, is at present disappointing—a tea-box turned upside down does not give a very beautiful architectural outline, and so strong an erection as has now been provided certainly needs to be crowned again. And crowned it might be now in a manner which its unstable foundations designed to its original constructors—namely, not with wood and lead, but with stone. Those who can imagine Boston Tower without its crown and pinnacles, or Fotheringay without its beautiful superstructure, or Coventry without its octagon and spire, can see what Peterborough central lantern wants and what, some benefactors assisting, it might one day receive. The period when this lantern was reconstructed must have been a busy one at this abbey, but unfortunately all documentary records are lost from the date of the completion of the north-west transept campanile tower, about 1274, and the Lady Chapel, soon after that date, to the "new building" in Perpendicular days, 1440–1518. But in the interval the side towers of the west front must have received their spires, the south a model of beauty, the north its incomplete companion. The Norman apse was then filled with Decorated window tracery, and other insertions took the place of the older windows. Like Ely and other places, it would have been well if the Perpendicular period had not suggested the vast amount of window tracery insertion that we find throughout Peterborough. The ravages of the Puritan soldiers are responsible for the destruction of the high altar screen of the choir, a celebrated structure which might well have been reproduced in the recent restorations. Then also happened the smashing of splendid glass, of noble monuments, and the overthrow of the original fittings of the choir. These last, however, are now being replaced in a manner which makes us the less regret the loss of their interesting predecessors. These destructions led to some repairs which have caused some perplexity to visitors, for on the demolition of the Cloister and Lady Chapel, the Cloister window tracery seems to have been employed in filling the arches leading to the Lady Chapel, while the Lady Chapel windows seem to have been inserted in the south transept chapels, probably then, as till recently, used as the vestries. To conclude this very slight sketch of a noble subject, I may say that at Peterborough we certainly have, perhaps, the most perfect ground plan and elevations of a great Norman church in this kingdom. Its transepts and its presbytery have no companions in this period, and its nave, though wanting in the ornamentation of Durham or Waltham, possesses a dignity peculiarly its own, while it still retains, though with some considerable alterations, its original painted roof. To the west of this fine Norman church we see the magnificent combination of designs which gives us the celebrated front, though, as



the late Mr. Petit used to say, we find Peterborough west front attached to the last church in England where we should naturally expect, from its earlier architectural history, to find it—namely, at Peterborough. I do not think, however, that Peterborough could very well spare it, and my apology for detaining you so long this evening must be my earnest desire, by drawing some attention to its needs, that Peterborough may be confirmed in the possession of so glorious an inheritance by the generosity, the love, and the skill of our own generation. Canon Davys closed by reading the following letter from the Dean of Peterborough:—"I think you may like to know the last thing we have done about the west front. Mr. Pearson has today received a resolution of the sub-committee to proceed at once with the works which he deems of the first importance, and which include:—(1) The underpinning and stiffening the foundations of the north central pier; (2) the centres for the north great arch; (3) shoring and strutting the northernmost of the three gables; (4) repairs of the several rings of the great arch; (5) grouting in the body of the walls; (6) the large groups of caps. The contract for this is £1,547 14s. This amount we have in hand, and we hope to obtain more help before our present funds are exhausted, so as to go on with the work without any interruption. We want about £8,000 more than we have yet raised."

Mr. S. W. KERSHAW, M.A., librarian of Lambeth Palace, in proposing a vote of thanks to the lecturer, remarked upon the numerous fine churches to be found in the Fenland, probably a result of the easy carriage of building materials during the middle ages along the rivers and dykes intersecting the area, and of the healthy rivalry that existed between the various communities of monks and church builders. Pre-eminent among these rose Ely and Peterborough, the beautiful Minsters of the Fens. He was glad to know that the latter cathedral had fallen into such good hands as those of Mr. Pearson, and that the necessary works of strengthening and repair were being carried out in a spirit of conservation, and not in the mode they deplored to see in France.

Mr. G. A. T. MIDDLETON seconded the motion, remarking on the very clear and lucid manner in which Canon Davys had shown, by reference to plan and perspectives, the process by which the great Benedictine church of Peterborough was built and repaired. A peculiar feature formerly existing was the apsidal eastern termination to the Norman transept as well as to the choir, an arrangement of plan common in the Rhenish churches of the Romanesque period, but scarcely paralleled elsewhere. Grand, and indeed magnificent, as all must admit the effect of the western façade to be, it was not satisfactory on closer study, for the narrow central opening and wider one on either side was obviously false, as marking the ordinary English arrangement of a nave and its smaller aisles. There was, it was true, a constructional reason for the anomalous spacing; but nevertheless, it left an impression of insincere treatment. Canon Davys had referred to the incessant appeals made by deans and chapters to the liberality of the British public in maintaining our cathedrals; but comparison of the results with the restorations carried out in France under departmental officials, and with the aid of Government grants, was entirely favourable to dependence on voluntary effort. The constant appeals for aid awakened general sympathy, interest, and pride in our ancient buildings throughout the country, and gave opportunities for discussing the proposals for restoration or repair with the utmost freedom, and full time for their consideration. The restorations of French cathedrals were not all, however, ill-advised. At Rouen, contrary to what had been reported, nothing had been done at present to the west front of the cathedral, and at Soissons he had recently inspected the restorations of the cathedral which had been denounced in the *Building News* by Mr. A. Vye Parmenter, and he could not agree with that writer's views. It was true that all the masonry had been gone over with a wire brush; but the tool-marks were left, and the stones were only cleaned, and not scraped. In Germany, however, and more particularly at Andernach and other towns on the banks of the Rhine, the work of restoration had been carried out so effectively that the old work had been killed.

Mr. ELLIS MARSLAND, hon. secretary, in supporting the motion, mentioned that the members of the Society would visit Peterborough Cathedral

on Saturday, June 20. From a structural point of view, he thought it would have been more satisfactory to have taken down and rebuilt the west front stone by stone, as had been done with the central tower, and the chapter would then have been certain that no further settlement could arise in the future.

The vote of thanks having been supported and put by the PRESIDENT, and carried by acclamation, CANON DAVYS responded, remarking that the mode of restoration might very confidently be left in the hands of Mr. Pearson, who had carried out the works in the south transept in a most conservative spirit.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fortnightly meeting of the Institute was held on Monday evening, Mr. Alexander Graham, F.S.A., President, in the chair. The CHAIRMAN announced that it was expected that the report of the special committee appointed to consider the whole question of the candidature and election of Fellows would be submitted at the business meeting to be held on Monday, June 8.

#### THE PALACE AT BARODA.

Mr. R. F. CHISHOLM, F.R.I.B.A., read a paper, illustrated by numerous elevations, plans, paintings, etchings, and photographs, and also a collection of plaster casts and photographs descriptive of Baroda's Palace, the town residence of H.H. Sir Syaji Rao, G.C.S.I., Maharajah Sahib Gaekwar, probably the most costly structure erected by a private individual during the present century. The building was designed and actually commenced by the late Major C. Mant, R.E., F.R.I.B.A. At the time of his death, in September, 1881, at the early age of 42, the general drawings to a scale of 8ft. to the inch were completed; the  $\frac{1}{2}$ in. scale enlargements for the entire lower story, and the greater part of the second story; also a considerable number of full-size working drawings of ornament. In actual work the foundations were laid, and the superstructure raised some 6ft. or 7ft. above the top of the plinth. At this stage the author was commissioned by the Gaekwar to carry the work forward to completion, as far as possible according to the original designs. The building measures about 500ft. in length by 150ft. in breadth, and covers an area of some 60,000 super.ft. The total cost, including mosaic work and decorations, amounted to about £180,000 at the present average value of the rupee—1s. 2½d. The palace stands by itself in an open park, and consists of three groups of apartments:—the public rooms with their courtyards approached by a porch on the north side, the Maharaja's rooms with their two courtyards approached by a porch on the west side, and the zenana or ladies' apartments with their courtyard approached by a porch on the south-west. The materials employed are brick with sandstone facing throughout; the greater number of the columns are of marble. Red sandstone from Agra and blue trap from Poonah are largely used for varying the colours of the surface. The floors are made fireproof throughout by iron joists and girders carrying arches on the lower flanges, and filled in with concrete. The author then described the building under the following heads: (1) The Plan; (2) the Exterior; (3) the Interior. The old palaces of India contain certain well-marked features: First, the entrance gateway surmounted by the nowbut rhana, or drum-house. This leads to an open courtyard, around which are grouped the Raja's public offices; and at the palace side the Durbar Hall, sometimes open, as at Agra, or sometimes with its separate courtyard, as at Ambur; beyond this a courtyard around which are situated the Raja's private apartments, and beyond these again, an inner courtyard surrounded by the ladies' apartments. The whole are inclosed by high walls or a range of one-story buildings. Major Mant had embodied these features in his plan, and arranged them in the same way, but with an eye to an architectural elevation. Two lessons were to be learnt from the building as constructed. First, it was an error to have made the major axis of the palace lie north and south, in place of parallel with the sun's path east and west; secondly, having so placed the axis, deep verandahs should have run along the west face. The author next

\* See perspective and plan of Major Mant's original designs for palace in *Building News* for Oct. 23, 1881.

dealt with the exterior, and showed by the aid of drawings how the general appearance of the building had been affected by the alterations made on the original design. Modifications had been made in the roof of the Durbar Hall, which, instead of being pitched as first intended, had been made flat. Unity was thereby preserved, and the flat roof served the purpose of a dancing-terrace. The main tower was remodelled, the original height being retained, but the clock faces and chimneys were omitted, and the principal dome was altered, and constructed entirely of stone. The style of the building is the latest period of what Fergusson called Hindoo Saracenic, standing about midway between the old red sandstone work at Agra and the later marble work which succeeded it, when the ornamentation bore the distinct impress of European hands, and there was a strong feeling in the details of the work at Bhurtpore. From an architectural point of view, the exterior was a distinct advance on most modern Indian buildings, as a successful attempt to combine native details with the ordinary requirements of a modern palace and arrangement of rooms. The author next considered the specific treatment to be adopted in modern Indian buildings in order to block out the sun's rays. Neither trabeated nor arcaded verandahs exactly answer the requirements, both having to be considerably modified by blinds or woodwork. In many public buildings the inmates suffer, the Government authorities discountenancing any defacement of handsome façades. Referring to the old native styles, and their adoption in modern buildings, the author eulogised Colonel Jacob's work at Jeypore, and testified to the invaluable services he had rendered to Indian architects by the publication of the series of details of Indian architecture. Having further discussed the defects and beauties of the Late Hindoo-Saracenic style, the author gave a minute description of the interior of the palace, the whole of the details of which were worked out entirely by himself. The Durbar Hall is about 92ft. long by 54ft. wide, and 48ft. high to the underside of the ceiling. The floor is of Venetian mosaics, and was put down by twelve Italian workmen, who spent about eighteen months in Baroda. The dado is of Carrara marble, inlaid with Venetian mosaics. All the spandrels of the openings are filled in with Venetian mosaics on a gold ground, and four recesses have groups of statuary representing painting, poetry, sculpture, and architecture, executed by the Italian sculptor, Signor Felici. The ladies' gallery is of elaborately carved teak-wood, filled in with the beautiful Deodar tracery from Pinjra. The walls are coated with fine Madras chunam. The main staircase is of Carrara marble, of an Oriental pattern, and decorated with gold lines picked out with fine lines of vermilion on either side, after the manner of the Delhi interiors. In both the above-mentioned apartments the ornament is flat, and all variety is obtained by colour and gilding. So far as he was able the author regulated every tint applied to the walls, and painted pieces of all ornament. It was the Gaekwar's desire that his architect should design the furniture and fittings of the palace in keeping with the general style of the building, and so to spend the money among the natives and improve their arts. A large stock of timber was purchased for this purpose, but it was found that the time required was too great, and the furniture was supplied by eminent firms in London, Paris, Calcutta, Bombay, and Madras. The grounds and parks surrounding this, and other palaces of the Gaekwar, have been laid out by Mr. Goldring, of Kew.

A short discussion followed, in which General H. ST. CLAIR WILKINS, and Messrs. GEO. ATCHISON, A.R.A., R. PHENE SPIERS, F.S.A., SILL, and the CHAIRMAN took part, and the proceedings were closed with the customary vote of thanks to the lecturer.

#### NOTES ON DOMESTIC DRAINAGE.—XV.

##### LAVATORIES.

THESE consist of one or more wash-hand basins conveniently arranged for ablution purposes, and having a supply of hot and cold water laid on to them. As a rule, the basins are either fixed or pivoted, the latter description being also known as "tip-up" lavatory basins. The basins are usually made of glazed porcelain, or, when liable to be subject to rough treatment, of enamelled cast iron. They should be circular or



oval on plan, with an entire absence of sharp angles or corners within the bowl, and the whole, as far as possible, self-cleansing. Fixed basins generally have a plain rim, as Fig. 73; but they can also be obtained with a flushing rim, as



FIG. 73.

shown in Fig. 74, in which case the water-supply may be turned on for a few seconds in order to thoroughly cleanse and flush the sides of the basin before use. "Tip-up" or "lift-up" basins were at one time very popular for lavatory fittings, and are still much used. They consist of a bowl

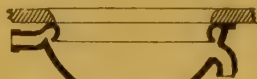


FIG. 74.

pivoted upon a receiver, into which the contents of the basin are discharged when turned upon its trunnions (see Fig. 75). Any danger of fracture when the basin is carelessly swung is avoided by means of an indiarubber buffer. The overflow weir or pipe from the basin discharges into the receiver below. Tip-up basins do not provide a thoroughly satisfactory form of lavatory, for the surface of the receiver and the underside of the basin become fouled with the constant discharge

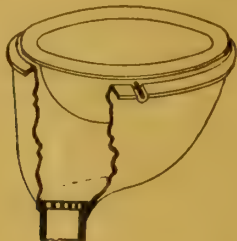


FIG. 75.

of dirty and soapy water. The bowl is frequently so arranged that it can be lifted out for the purpose of cleansing the receiver; but even if the greatest care be exercised in the frequent cleaning of the fitting, the provision of such a large and unnecessary fouling surface on the basin-side of the trap, and which in itself is not self-cleansing, is a serious sanitary objection.

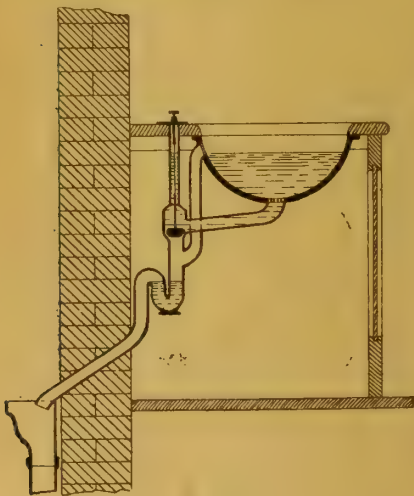


FIG. 76.

The lavatory top may be of slate, marble, porcelain, or other impervious material. Where marble is used, it should be properly bedded in plaster of Paris, and not in oil putty, as the oil is liable to penetrate the marble, causing unsightly stains which cannot afterwards be removed.

The lavatory fittings are generally placed within a wooden inclosure for appearance's sake; but it is better to support the fitting on brackets, so that everything may be exposed to view.

A good lavatory requisite should fulfil, as far as possible, the conditions already mentioned for the proper construction of an efficient plunge bath, and which need not be again repeated. Perhaps the most serious sanitary defect to be found in the average lavatory fitting with a fixed basin is the almost universal use of a concealed and inaccessible overflow pipe, together with a comparatively large soiling surface between the outlet of the basin and the plug.

Fig. 76 is typical of such an arrangement having a solid waste plug with inaccessible overflow

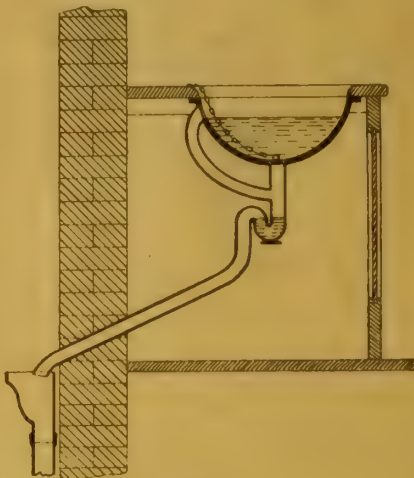


FIG. 77.

arm. Instead of the trap being placed directly under the outlet of the basin, it will be seen that there is a very large fouling surface between the basin outlet and the plug, which, in the course of time, gradually becomes furred with greasy and soapy deposits. The overflow arm also becomes fouled in the same manner, and is ordinarily so fixed that its interior cannot either be readily inspected or cleaned. These defects are also apparent in the common form of lavatory basin, a sketch of which is shown in Fig. 77.

Lavatory basins provided with a concealed standing overflow and waste, as shown in Fig. 78, should be avoided. The objections to

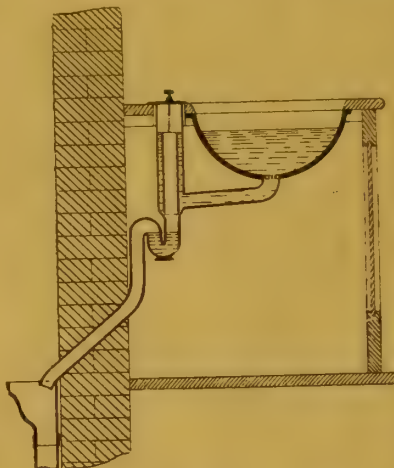


FIG. 78.

this form of waste and overflow as applied to baths have already been indicated (see Fig. 64), and the same remarks apply with equal force to any similar arrangement for lavatory fittings. In Fig. 78 a siphon trap is shown under the standing overflow, in place of the dip form seen in Fig. 64.

A simple form of standing waste and overflow pipe is shown in Fig. 79. This is fixed in an open recess at the back of the basin, with a siphon trap immediately under. The waste is opened or closed by raising or lowering the stand-pipe, a half-turn keeping it open when the basin is required to be emptied. Every part of the waste

and overflow on the basin side of the trap is visible and easily cleaned.

Another form of exposed standing waste and overflow is shown in Fig. 80, the details of which are similar to those described for a standing waste and overflow for baths (see Figs. 65 and 66).

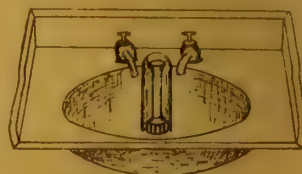


FIG. 79.

In some districts the water company will not permit the use of any description of overflow pipe which is arranged to discharge into the lavatory waste pipe, but insist upon the overflow being carried through an outer wall so as to discharge in some prominent position.

Under such circumstances no form of standing waste and overflow can be adopted; but the basin overflow must either discharge directly into the open air, or be arranged to discharge into a safe or tray fixed directly under the basin in a manner similar to that already described for baths fixed under the same conditions (see Fig. 67). The water supply should discharge above the highest water level of the basin, whilst the provision of self-closing taps is also enforced by some water companies. Lavatory basins which admit the water supply through the waste pipe should be avoided altogether. The waste pipe should not be less than 1½ in. or 1¼ in. diameter, in order that a rapid discharge may be obtained, and also to

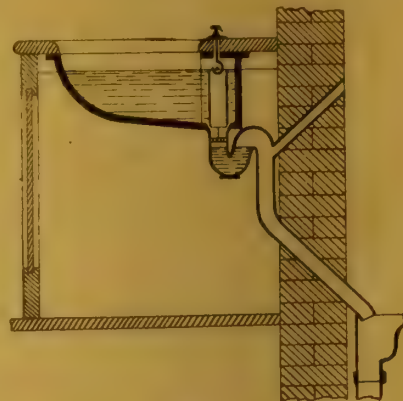


FIG. 80.

assist the flushing of the drains. When a perforated grating is fixed to the basin outlet, it should be large enough to allow of the waste pipe and trap running full bore when the basin is being emptied. The lavatory waste should discharge outside the building over a trapped gully or the hopper head of a vertical waste, as already described. An anti-siphonage pipe should also be fixed near the top of the siphon trap to the waste, as shown in Fig. 80.

## FACTORY CONSTRUCTION AND FACTORY ACTS.—II.

By GEORGE H. BIBBY, F.R.I.B.A.

### MEANS OF EXIT.

UNDER the provisions of the Factory and Workshop Acts and the laws relating to public health, all factories and workshops will be deemed to be so overcrowded as to be dangerous or injurious to the health of the persons employed if the space in any room therein bears to the number of persons employed at once in any apartment a proportion of less than 250c.ft.; but under certain conditions a Secretary of State may direct that these figures shall be considerably increased. For instance, if electric light be not used in any room, and gas be used for illuminating purposes, the number of persons working there must be reduced materially. Therefore, if a factory be constructed with a ground and four upper floors, each 100ft. in length by 40ft. in width, under the most favourable circumstances the occupier would be permitted to employ not



more than 192 persons on each floor, or 960 in the whole of his factory; and it is for such maximum numbers that sufficient staircases and exits would have to be provided, unless the conditions under which any factory may be worked are so unfavourable as to considerably diminish the number of workpeople allowed by the factory inspector to be employed on the premises.

In Lancashire, many cotton factories are built of enormous size, and of five or more stories in height, each floor frequently forming one room only, with staircases at each end, erected with fire-resisting materials in every part, and with staircases formed with stonework in short straight flights, and with spacious landings, handrails on both sides of the steps, and built within inclosures of substantial brickwork, in which are inserted iron doors on each floor, made to open outwards. Such arrangements as these have long been common in that district, and put to shame in some details the constructional arrangements (as regards staircases and means of exit) of large numbers of factories and workshops in other counties, and in the Metropolis.

Even when all the arrangements of the doors and staircases are perfect, the machinery, articles for manufacture, and stores may be so disposed in a factory as to obstruct a direct and easy exit from the premises. A reference to this possible difficulty is contained in the First Schedule of the Factory and Workshop Act, 1895, wherein it is stipulated distinctly that "no grindstone erected after the commencement of this Act shall be run before any door or other entrance" (the term "other entrance" clearly including staircases or step-ladders).

Amongst the disadvantages to the workpeople arising from the division of each floor into numerous apartments, must be included the possibility of a fire or panic originating in rooms

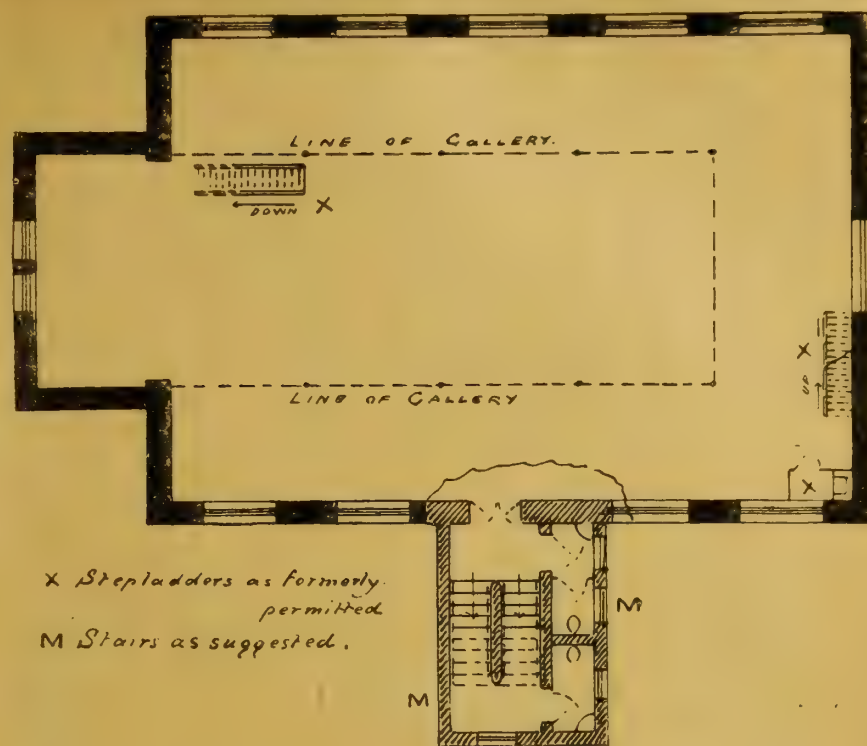


Fig. 3.

ever, extends the Act of 1891 to workshops and laundries, both old and new, all of which must now be inspected with the view of ascertaining whether or not the persons working on the upper floors are properly supplied with means of exit and staircases.

Large numbers of factories, workshops, and laundries exist throughout the provinces and Metropolis which were never built for the purposes for which they are used. Many were originally erected as private residences, and the bedrooms and apartments on the upper floors having been converted into workshops, large numbers of persons may be found employed in them with no other means of escape than that frequently narrow winding and dark staircase which, even had it been sufficient for the members of an ordinary household, is yet totally inadequate as a means of escape for workpeople in large numbers, constructed, as it usually is, of wood, and in communication perhaps with goods and manufactures of a dangerous nature.

Other factories have been converted, for their existing purposes, from buildings formerly used as chapels, schools, prisons, music-halls, theatres, storehouses, &c., and it can be well understood that the original staircases or step-ladders are wholly unsuitable, in arrangement or construction, as exits for the workpeople.

In Fig. 2 is given the section of a building formerly used as a chapel in the midland counties, but converted into a factory. The open space between the galleries was covered in with a boarded floor, as shown by dotted lines, and, the chapel being sufficiently lofty, two other floors were similarly constructed (also as shown by dotted lines). The top floor was lighted by means of openings in the roof, the first and second by means of the original windows, which were entirely filled in with panes of glass set in frames of ironwork, and not made to open. This factory was used by a cabinet-maker, who employed a large number of workpeople. The original staircase was found to be placed in an inconvenient position as regards the work of the factory, and was removed. Openings were therefore left in the floors, and the three step-ladders arranged as shown on Fig. 2.

No doors or openings were provided on any of the three upper floors, and the only direction of exit for those employed above was by way of the step-ladders. This example is given as by no means a most extreme instance of the danger of insufficient staircase accommodation, but is in evidence of the combined dangers of three floors with joists unprotected by plastering, of isolated step-ladders of wood construction, of iron window-frames not capable of being opened for escape, and of the dangers to be expected from fire in a building where woodwork and shavings

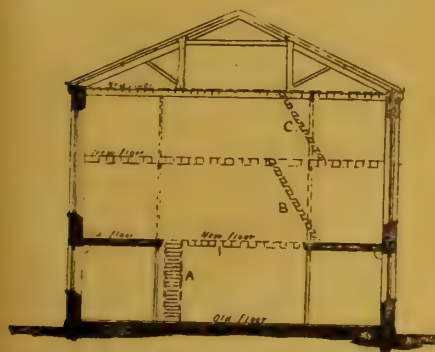
are dispersed in the factory operations, and where gas or fire is necessary for the purpose of boiling glue, &c. Should a fire occur near the step-ladder on the ground floor the whole of the persons on the three upper floors would be liable (even if a fire below were quickly extinguished) to suffocation from smoke; but in all probability, under the circumstances described, the building would be rapidly destroyed by fire.

In Fig. 3 is shown a plan of this "chapel" factory. X indicates the position of the dangerous step ladders and other defective arrangements, while M shows a suggested improvement.

A water-closet is shown to be partitioned off from the workshop by woodwork, but opening directly into the apartment. This is not only objectionable from a sanitary point of view, but also a source of danger to the step-ladders, near to which they are placed, inasmuch as workpeople will disobey rules as to smoking and matches. A light thrown down and unobserved in such a portion of the building might be discovered too late to avoid disaster.

In the proposed addition at M, the stairs and inclosure is entirely of fire-resisting materials, as also would be the floors of the new water-closets, &c.; but there is intended to be no interference with the woodwork construction elsewhere, for however desirable alterations in that direction might be, yet the expenses under the circumstances of the case would be beyond what it would be reasonable for any sanitary authority to demand in the case of an existing factory; but some of the windows should be altered so as to be capable of being used in conjunction with those movable fire-escapes mentioned in the Factory and Workshop Act, 1895, sec. 10, sub-sec. 1, which is worded thus:—"A court of summary jurisdiction may, on complaint by an inspector, and on being satisfied that the provision of a movable fire-escape, or movable fire-escapes, is required for the safety of any of the persons employed in a factory or workshop, by order require the occupier of the factory or workshop to provide and maintain a movable fire-escape, or movable fire-escapes sufficient for that purpose."

The staircase of a factory or workshop, together with its adjuncts, should not only be of fireproof construction, but the doors directly leading into it should be of iron (at any rate, in the case of large factories or workshops). This fire-resisting erection should also be carried to a higher level than the roof of the main factory (if the latter should not be of fire-resisting materials). Further than this, there should certainly not be allowed any openings of any description in the walls inclosing the staircase, such as may be frequently seen for the purpose of carrying power by means of shafting or belting, or for the purpose of ventilating openings or fans, &c. Such openings

SECTION.  
Fig. 2.

isolated from those portions of the premises occupied by the bulk of the persons employed. In many factories and workshops this difficulty is almost unavoidable. Various operations must be kept quite distinct from one another, and be performed in separate apartments. Trade secrets must be preserved, and in many factories the conditions under which the work is carried out require that the sexes should be separated entirely, although in many instances they may be found, both in the provinces and Metropolis, working at tables, seated side by side.

The Factory and Workshop Act, 1891, with regard to staircases and means of exit from the upper floors, provides that every factory of which the construction is commenced after the first day of January, 1892, and in which more than 40 persons are employed, shall be furnished with a certificate from the sanitary authority of the district in which the factory is situate, that the factory is provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as can reasonably be required under the circumstances of each case, and it is the duty of the various sanitary authorities to examine every such factory, and on being satisfied that the factory is so provided, to give a certificate to that effect.

With regard to all factories erected prior to the year 1892, the sanitary authorities are directed to examine them, and, if necessary, to specify to the owners the measures necessary for the improvement of the existing means of escape—such as the widening of doorways, the removal of obstacles, and the provision of staircases erected of fire-resisting materials.

The Factory and Workshop Act, 1895, how-



might, in the event of fire, permit flame and smoke to destroy the utility of the staircase.

Any openings into the various work or store-rooms of a factory, that may be necessary for purposes of ventilation or the communication of power, should always be made from the exterior walls or from trunks constructed of fire-resisting materials.

The staircases should be well lighted, both by day as well as night, the landings nowhere less in width than the staircase, and goods should never be allowed to remain or come in upon such landings even temporarily, nor should fixtures of any kind be permitted (excepting fire-buckets, &c.) unless under very exceptional circumstances, and then only if the width of the landings be left of an equal width, at least, with the remainder of the staircase.

The doorways to all staircases should, if possible, always be visible from all parts of a large workroom occupied by many workpeople. It is manifestly a great disadvantage for doorways of exit to be placed in out-of-the-way corners, or behind machines, or near to portions of the building where shafting, belting, and pulleys are arranged in a complicated manner, intersecting each other at many angles (however perfectly all these may be protected by drum-boards, hand-rails, and belt-guards). Further than this, the doors leading to the staircases should always, if it can be at all conveniently arranged, be placed in such a position that it will not be necessary to pass over floors covered with slush from certain manufacturing operations, and wherever a crowd of workpeople during a rush might be liable to fall and injure themselves or each other; for, although the first schedule of the Factory and Workshop Act, 1895, provides that every floor which may be constructed after the commencement of that Act shall be so constructed and maintained as to facilitate the removal of slush where such is likely to accumulate, and that all necessary shoots, pits, and other conveniences shall be provided for facilitating such removal, yet it cannot be reasonably expected that, with many factory operations, it can be practicable to keep all portions of the floor free from slippery matters; but every effort should be made to provide against the occurrence of such defects on the approaches to the staircases.

(To be continued.)

## CONCERT-HALLS AND ASSEMBLY-ROOMS.—XVII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THERE is a concert-hall in Aaran (Figs. 1 and 2) which was erected in 1882-1883 by Mr. Agliser, of Zurich. It consists of two halls side by side, the larger of which has a seating capacity for 800 people, with an orchestra platform at one end. The smaller hall will accommodate 400 persons, and is provided with a small stage for theatricals. Over the small hall on the first floor are practice-rooms, while in other parts of the building are the necessary cloak-rooms and refreshment-rooms. The two halls together have a cubical contents of 11,600 cubic metres, giving 9.75 cubic metres per person. A notable feature in the design is a covered carriage way in front, so that people may alight protected from the weather.

In Figs. 3 and 4 are represented a concert-hall at Basle; a hall which is in direct connection with the town casino, and was built in 1871-1873. The concert-room is constructed to accommodate 1,500 people—1,000 on the floor level, and 500 in the gallery. The orchestra is built for 50 performers, but it can be enlarged when a choir is needed. This hall is designed on strict rules of proportion, being 36 metres long by 21 metres wide, and 15 metres high; each of these dimensions is a multiple of three. The height and width added together are equal to the length, therefore the width deducted from the length equals the height, and the height from the length equals the width. This is one of the best-proportioned halls on the Continent, and it was erected from plans by the architect, Mr. Stehlin Burckhardt. There is a gallery of two rows of seats on either side of the hall, while at the back the number of rows is increased to five. A large foyer or saloon is placed on the gallery level over the covered carriage-way.

Concert-halls vary greatly in their dimensions and holding capacity. There is no difficulty in providing a building where 1,500 to 2,500 can hear and see with ease; but when a larger number than this has to be accommodated in a

hall, so that they may be able to listen without difficulty to the performance, then many difficulties arise which have to be overcome before a satisfactory concert-hall is provided. There are, of course, many buildings where a very large audience can be seated, notably the Albert Hall;

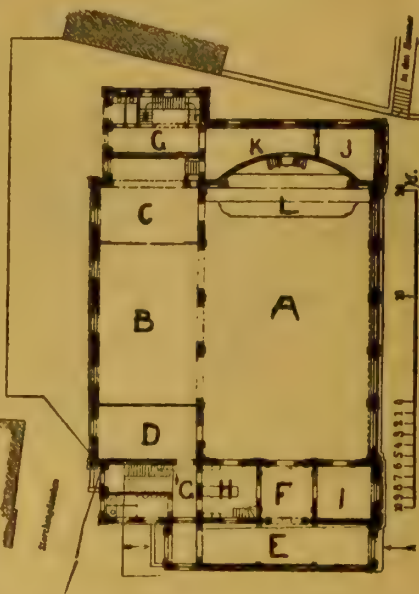


FIG. 1.—A, large hall; B, small hall; C, stage in small hall; D, vestibule; E, covered carriage-way; F, entrance hall; G, principal staircase; H, buffet; I, retiring-room; J, musicians' room; K, musicians' room; L, orchestra.

but there are few of such vast proportions which are as satisfactory in the many respects which make this hall so notorious throughout the world.

The Fest Halle at Karlsruhe (Fig. 5) is one of the halls of the larger class, as it seats 5,000 persons. It was built in 1875-1876 by the architect, J. Durin. This huge building stands isolated in a large park, so that ample provision for entrances and exits was made without any difficulty. There are nine separate entrances and six staircases, distributed along the sides and at the rounded end. The building is of sandstone

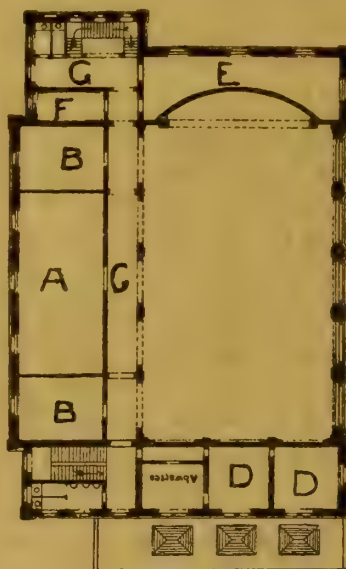


FIG. 2.—A, small hall; B, retiring or practice-rooms; C, corridor; D, practice-rooms; E, store-room; F, cloakroom; G, staircase.

and brick, with roof and gallery of wood. There is no doubt, though the building was erected ostensibly for holding musical performances, that it is one more adapted for the purpose of a fête building.

In Fig. 6 is given the plan of one of the smaller concert-halls which was built in 1869 at Dresden by Hugo Strung. The hall is in the rear of the building on the level of the ground. It measures

25.5 metres long by 18.5 metres wide, and 11 metres high, with a gallery on three sides and orchestra one end. Although built for a concert-hall, it was soon converted into a variety hall under the name of the Victoria Saloon, the orchestra was removed, and a stage added.

In Cologne (Fig. 7) is a concert-hall of older date than those which I have been describing, and, like the old Gewand Haus of Leipzig, it is largely constructed of wood. It has three sides facing the streets. The hall is 53 metres long by 21.5 metres wide, and 15 metres to the apex of the roof, the form of which will be seen in the section (Fig. 8). The height to the springing of the ceiling is 11 metres. The seating capacity is 2,500. A gallery surrounds the hall to a depth of 8.25 metres. It is stated that at concerts given in this room kettle-drums, cymbals, and such-like instruments the sound from which is obtained by beating, are generally omitted, and the probable reason for this omission is that there is so much wood in the construction of the hall,

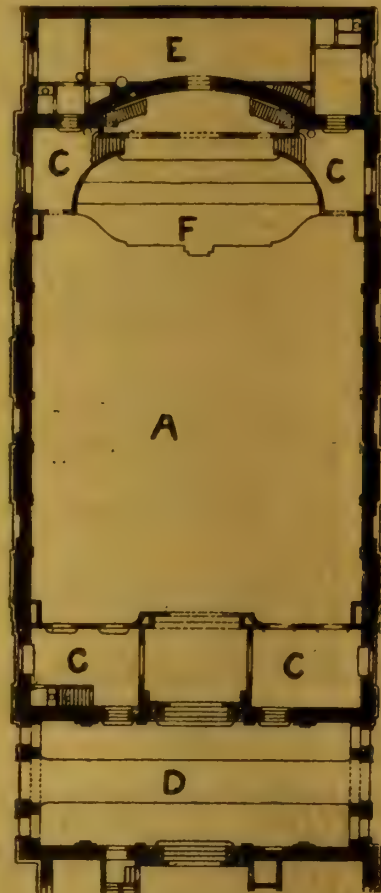


FIG. 3.—A, concert-room; C, cloakrooms; D, carriage-way; E, musicians' room; F, orchestra.

and therefore great resonance. There is room in the orchestra for 76 musicians and 266 singers; but on occasions the orchestra is enlarged to allow of 160 members and 600 voices.

So far, I have been speaking of the concert-hall erected solely for orchestra and choir for the performance of concerts on a large scale; in most of the examples we have seen that, in addition to the large hall, a small one is generally added for the purpose of chamber music, soloists, and pianoforte recitals.

There are many such rooms, however, existing independent of large establishments, and of late it has become the fashion for pianoforte manufacturers to add to their showrooms a saloon in which professionals may give recitals and concerts, and so bringing the name of the manufacturer, and the merits of his instruments, before the public. Some of these rooms are most perfectly appointed; and, for example, for a music chamber, it would be hard to find a more charming or complete room than the Salle Erard, the merits of which, however, the authorities at Spring-gardens have failed to discover, as they have not honoured it by including it in their list of licensed places.

London is not well provided either with concert-halls of the smaller or larger class; but from the



fact that one of the best halls of the former kind has been converted into a restaurant, there is no doubt that the supply is equal to the demand. We are not the music-loving people that our German cousins are, and the consequence is that until the Queen's Hall was erected, with the one

I have seen rooms—schoolrooms—built on plan in the shape of a carpenter's square, with the platform placed in the angle, so that no portion of the audience could see the full face of the performer, and the singer had either to turn his back

manner of inconveniences, because of the inadequacy of the dressing-room accommodation; but I wish to draw the attention of my readers that it is also in concert-halls that architects forget the artists. An ill-conceived, ill-ventilated, draughty, damp, or cold waiting-room frequently is all that is supplied in which the performer has to wait his turn on the platform. Surely the

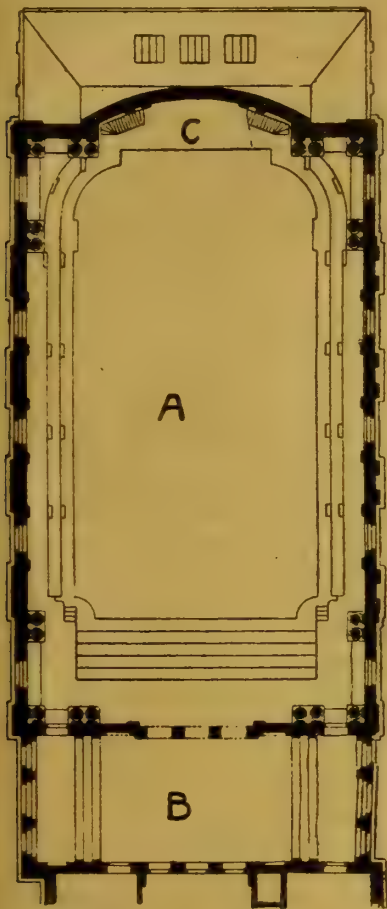


FIG. 4.—A, upper part of concert-room; B, foyer; C, gallery.

exception of the Albert Hall (which we owe to the efforts of a German prince), London did not contain a large concert-hall worthy of such a city.

The makeshifts we have to put up with by the adoption of buildings of all sorts and conditions

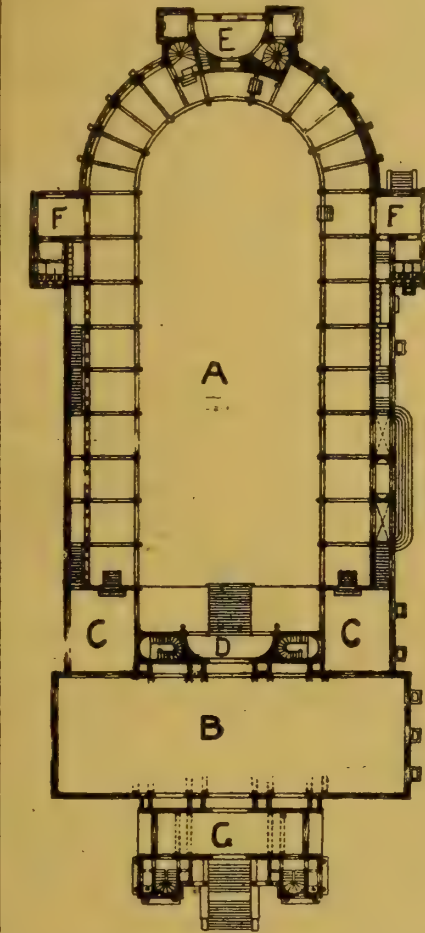


FIG. 5.—A, large hall; B, small hall; C, retiring-rooms; D, platform; E, entrance; F, lavatories; G, entrance.

upon one-half of the people while singing to the other half, or else sing to the wall opposite.

I have seen rooms employed for public entertainment where kitchens, and cellars even, had

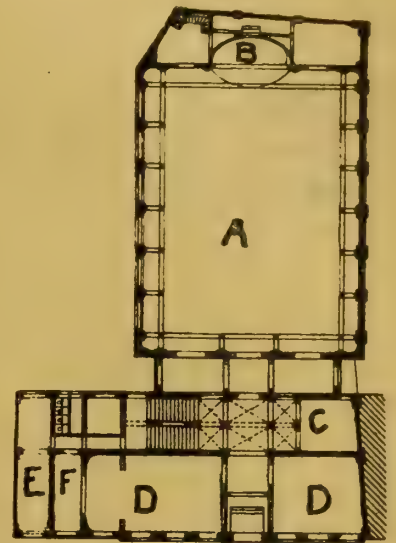


FIG. 6.—A, concert-hall; B, orchestra; C, box-office; D, refreshment-room; E, lavatory; F, buffet.

performers require as much care as the audience; their lives are as valuable—perhaps more so.

I have frequently heard artists speak of the neglect shown to them in planning places of public entertainment, and a proposal lately made by an eminent actor that the people who have always to occupy the building, daily and nightly, should have some voice in the matter, and be

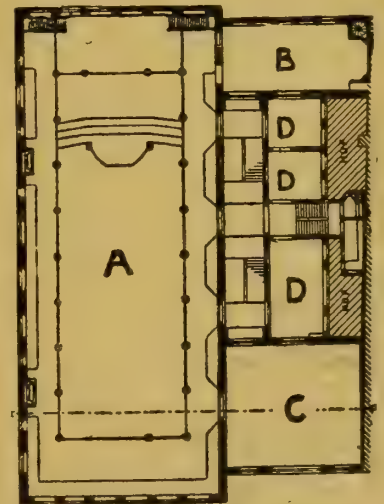


FIG. 7.—A, concert-room; B, musicians' room; C, small hall; D, retiring-rooms.

allowed by the building owners to consult with the architects, appears to me an excellent one, as it is impossible for an architect to understand the requirements of the performer as well as the performer does himself.

#### "THE CELESTIAL INSTITUTE," FROM THE A.A. STUDENTS' STANDPOINT.

EACH year the preparations for the soirée of the Architectural Association, at which license is taken to caricature freely, but not in an unfriendly spirit, the prominent architects and leading professional topics of the day, show a tendency to increase in elaboration and effect; and the musical play given on Friday evening marked a further advance on previous efforts. Once more the meeting place was changed, and this time the commodious and centrally situated St. Martin's Town Hall in Charing Cross-road,

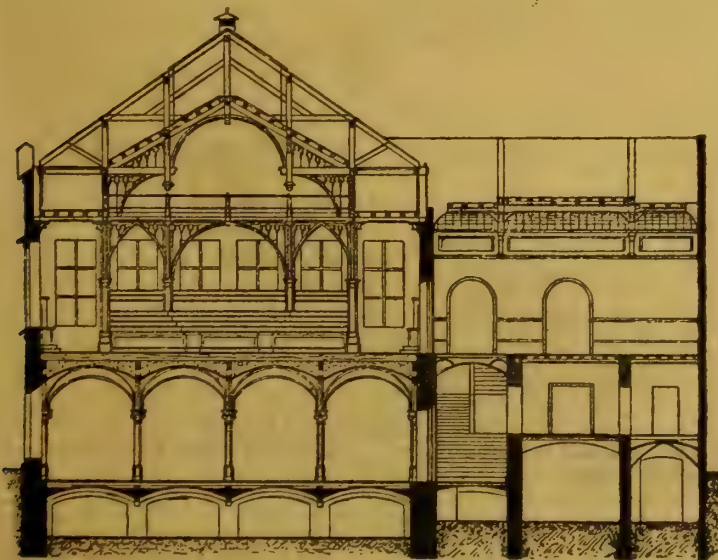


FIG. 8.

for musical recitals are neither fair to the performers nor to the audience, for the acoustic qualities of the room are not, as a rule, suitable for the voice or the instrument, and the entrances, exits, fire-resisting and extinguishing appliances are not sufficient for the safety of the public.

to be used for retiring-rooms for the performers; and this brings me to notice a very oft-forgotten requirement in buildings of this class. It is not only in theatres, as Mr. Wilson Barrett pointed out lately when addressing the Actors' Association, that the performers have to put up with all



was engaged for the performance. Hitherto, the devisers of this yearly architectural burlesque have followed the precedent of Shakespeare's days in selecting gentlemen to represent the female characters necessary to round off the plot of their play; but on Friday night, half a dozen ladies undertook the rôles allotted to their sex, with a vivacity and grace that added much to the enjoyment of the evening.

The play, which was entitled "The Celestial Institute," was written by Mr. E. Howley Sim, and may be characterised as a parody of "Trilby" bestrewn with topical allusions to current professional questions. These points were less plentiful and less personal in character than in former years, but were as quickly apprehended by the numerous and enthusiastic audience. There was a marked absence of the puns and quips which have often formed a prominent feature of the entertainment. The operetta was set to tuneful music by Mr. Leonard Butler, was produced under the direction of Mr. G. B. Carvill, and went with the smoothness that told of arduous rehearsals; the characters, about a score in number, being all letter-perfect in their parts, while a word of praise is due to the orchestra of amateurs, all members of the profession. A self-important secretary was represented by Mr. A. Stalman, while Mr. F. D. Clapham made up as an equally pompous librarian. Mr. G. B. Carvill parodied Mr. Beerbohm Tree in Svengali, Mr. H. Phillips Fletcher was clad in armour as the (German) Emperor, Mr. A. Lovejoy's commanding inches lent dignity to the part of Taffy, Mr. W. W. Furlong personified the Laird, but failed to reproduce the Scottish accent essential to the part, and Mr. Stefanos Constanduros, whose ballad singing was the feature of the evening, played Little Billee to Miss Florence Lincoln's charming impersonation, à la Dorothea Baird, of Trilby. The two candidates were represented by Messrs. E. S. Collins and T. H. Turner; the councilman and sub-councilman by Messrs. E. A. Rickards and Alfred Cox; while Messrs. R. C. Bolton and H. H. Gilbert undertook, in their dual personalities, to bear the entire burden of a committee and sub-committee. Miss Grace Wylde posed as Chrysanthemum, Miss Ada Yerbury as Ylang-Ylang, and Misses Rimell, Carvill, and Ethel Williams as three lady students. Five boys (D. Carvill, S. Elston, P. Albert, A. Watts, and H. Williams) acted as chorus in an unobtrusive way. The action was supposed to be in China; but while the characters transplanted from M. Du Maurier's play were the original English attire, the Institute officials, ladies and boys, were dressed in Japanese costumes. These and other anachronisms only added, however, to the fun of the performance.

The curtain rose upon the interior of an Institute of Architects at Peking, and showed a number of lady students varying the monotony of their "drawing-board" work by an occasional song and comparing notes on the designs sent in for a studentship. Under the pledge of secrecy, Chrysanthemum reveals the fact that the Emperor has ordered all the committee within a month after election to be married to students in strict rotation of rank, beginning with the president. The librarian enters, and insists on much red-tape and filling up of forms before issuing a book, to be followed by numerous fines for breaches of regulations. The three students, Taffy, the Laird, and Little Billee here enter with drawing-boards, and would fain sketch a pagoda, but are sternly informed by the librarian that all details are copyrighted. In a trio they explain that they are travelling round the world in search of Trilby, who has left the London stage. After his companions have gone, Little Billee breathes forth his love in a brightly-written ballad. Svengali, an itinerant conjurer, enters with Trilby, and, finding a poster on the walls of the city inviting mandarins to become candidates for the presidency of an institute, decides to enter the competition, explaining that, by his hypnotic powers, his clients, on looking in his eyes, see in his work whatever he chooses to see, "may-be a bit of Gower-street, or perhaps Southampton-row." He enters his name on a form, and awaits developments. Trilby and Little Billee meet in the library, but are hustled out, as a council meeting is to be held. An amusing burlesque of the preliminary business in another place followed, the inarticulate gabbling of a secretary, the formal reception of new members, the reference to a dull and worthless paper by Prof. Halicanassus being received by the audience with

hearty laughter. After hearing the reports of the examiners, the council proceed to award a studentship for prize drawings. Lots are drawn, and the prize is awarded to Chrysanthemum, who, however, protests that she did not submit a sketch; nonplussed for a moment, the council report that no designs of sufficient merit were submitted to justify an award. The three students from England enter, and after answering a single test question, are admitted as members. The election of a president follows. One candidate aspires to the office on the strength of his titled relations, a second pleads that he has "pockets full of schemes for education, improving everybody's but his own"; but Svengali so beguiles the council by his mystic powers, that he is unanimously chosen, and at once announces his intention to wed Trilby, who is the daughter of a duchess. The curtain falls on Trilby and Little Billee inconsolable and tearful, bewailing the fate which separates them for ever.

In the second act, all the girls are about to be wedded to the officials in order of rank; each feels she is being wrongly mated, while questions of precedence cause many heartburnings and jealousies. The male students, severally in love with Trilby, Chrysanthemum, and Ylang-Ylang are equally miserable, as they are not in the council set, and consequently not eligible, but cheer each other up in a trio. The council again meet, but the President being late they reveal several professional secrets as to how to succeed as an architect. One designs flats, advertising his name on gigantic boards on the works in progress; a second takes in pupils, whom he teaches nothing, but gives them leave to attend college classes; while a third trusts in ghosts at low terms to turn out his plans, details, and specifications. Finally they conspire against their president on the ground that he runs "architectural co-operative stores," and on his arrival threaten to depose him. Svengali turns their wrath by offering to make them directors, and all now promises to go smoothly as a marriage bell—indeed, the wedding procession is entering at the moment—but for the arrival of a *deus ex machina* in the person of the Emperor, who decrees that all should undergo the ordeal of an application of the Röntgen rays to moral investigation. Placed in turn before a camera, Svengali, of course, proves a very prince of darkness; the members of council are tainted with the shade of commercial architecture; while, on the other hand, Little Billee and his two friends are declared to be white as driven snow. Thus, Vice is defeated, and Virtue triumphant, and the curtain falls on the discomfited council men, and the three students, now happily united to the girls of their choice, Little Billee being nominated by the Emperor as President in Svengali's stead.

Although, as will be gathered, the plot was thinly woven, the bright music and the good acting and singing made the piece go. Many of the numbers were redemanded, and at the close the author, Little Billee, and Trilby had to appear in response to loud calls.

#### FOUNDATIONS OF HEAVY BUILDINGS.

SEVERAL modes by which heavy buildings, such as those built in New York City, fail are described by Mr. Charles Scoysmith, M.Am.Soc.C.E., in a paper read before that society. The upper material of New York is mud, silt, and sand of varying degrees of fineness, and gravel. The hard stratum below, if not rock, is what is known as "hardpan," which contains stones of various sizes, is made up of silt, clay, and gravel, and is firm and compact like rock in hardness, and can only be dug out by pick and chisel. This hardpan is unyielding and can be trusted under the heaviest building. The Manhattan Life Insurance Building, built on fifteen caissons proportioned to carry a pressure of 10·8 tons per square foot, is built on this material and has not yielded. It is said to be able to bear, by means of a concrete base, 150lb. per square inch or 10·8 tons per square foot. Mr. Scoysmith observes that buildings of the ordinary height seldom put upon the earth greater weight than three or four tons per square foot; their walls were spread over the surface by the means of footings and concrete. With the greater increase of the height of building, these methods became quite inadequate. One of the great dangers or risks from overloading the soil is lateral flow, and this has to be prevented by various means. When the foundations are not carried to the substratum of rock or "hardpan,"

it is necessary to discover what vent, if any, may be given for the underlying material by excavation or drainage near. The danger of the material squeezing out under the pressure, as in the case of buildings resting on sand, is very obvious, and the author alludes to the serious danger or disastrous settlement of heavy buildings, which may take place at any time, by excavations near them, even such as putting in foundations of buildings and in pumping operations, especially if accompanied by jarring, vibration, or by hoisting. Under such conditions, the material under the heavy building is likely to squeeze out towards the excavations. Pumping water near a heavy building from a well has sometimes caused settlement, owing to this tendency of the soil to escape. Settlement of buildings is frequent in the vicinity of rivers, where there is often a movement of the entire mass of soft material going on, and an instance is given of one building which has been wrecked by the subsidence of the piers, the entire mass of the subjacent material or silt having slipped towards the river. Driving piles is one of the best preventives, especially where they are wholly submerged. The New York building law allows a load of 20 tons per pile. The author refers to the mistake of taking the aggregate bearing capacity of pile foundation to be the sum of the safe loads on the individual piles. In some cases the piles only displace the material, and transfer the load direct to the stratum beneath them, which may be of a yielding kind. The author also speaks of the risk of lowering the water level by pumping, and so exposing the piles, which then soon decay; also of the raft method of foundation, which is employed largely in New York, in which steel beams are used to spread the bearing to a sufficient depth. Reference is also made to the use of steel caissons sunk by the pneumatic process, employed by the architects of the Manhattan Life Building, Messrs. Kimball and Thompson; and to the foundation of the new Johnston Building by means of open wrought-iron cylinders, sunk by the water-jet process. The pneumatic process is one of the safest methods for deep excavation, and the author appears to favour it.

#### CHIPS.

A congress of the National Registration of Plumbers will be held in Edinburgh on June 25th, 26th, and 27th, under the auspices of the District Council of Edinburgh and the East of Scotland. An exhibition will take place concurrently with the meetings, of plans of model dwellings, and of sanitary and ventilating appliances.

The Sheffield new town hall turret clock has just been completed. The time is shown upon four external dials, 8ft. 6in. each in diameter, the clock frame being 7ft. 6in. long, 2ft. 6in. wide, and 18in. deep, and the main wheels 22in., 20in., and 20in. diameter respectively, the pendulum beating every two seconds, and is compensated. There are also two index dials inside the clock chamber—one showing the seconds, and the other the minutes, as at the Cathedral, Lincoln, large clock, which was made and fixed by the same makers—viz., Messrs. Wm. Potts and Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne.

At the Canterbury Consistory Court, on Wednesday week, application was made for a faculty to authorise certain alterations and improvements in the parish church of East Sutton, Kent, and for a confirmatory faculty in respect of some works which had been carried out in the church this spring on sanitary grounds. The faculty and confirmatory faculty were granted.

Alterations and additions are now in progress at the Primitive Methodist chapel, Seaham Harbour. Memorial stones were laid for the new school buildings on Saturday, May 16th, by various ladies and gentlemen. A new porch is to be built to the chapel, and the interior renovated and improved. The architect is Mr. Sidney Walton, of 42, Fawcett-street, Sunderland, successor to the late Mr. Joseph Shields, of that town.

The first sod of the North Sunderland Railway was cut on Thursday in last week. The line commences at Chathill, where it forms a junction with the North-Eastern Railway, and terminates opposite the lifeboat house at Seahouses. It passes close to Fleetham, where it is intended to make a siding for agricultural purposes, and also to North Sunderland, where a small passenger station will be erected. The line will be a single one, of the regulation gauge, and its length will be a little more than four miles. The engineers are Messrs. R. Elliott Cooper, of Westminster, and Messrs. Watt, Sandeman, and Moncrieff, of Newcastle-on-Tyne, and the contractor is Mr. Hazlett, Mr. George Levitt being the contractor's engineer.



## CONTENTS.

Why Architects Neglect Colour .....	735
What to Specify .....	736
External and Party-Walls .....	737
The Society of Architects .....	737
Royal Institute of British Architects .....	739
Notes on Domestic Drainage.—XV. .....	739
Factory Construction and Factory Acts.—II. .....	740
Concert-Halls and Assembly-Rooms.—XVII. .....	742
"The Celestial Institute" from the A.A. Students' Standpoint .....	743
Foundations of Heavy Buildings .....	744
Our Illustrations .....	745
The Building News Directory .....	IX.
Building Intelligence .....	764
Engineering Notes .....	764
Cast-Iron in Builder's and Contractor's Work.—XXIII. .....	765
Cause of Damp and Decay in Masonry .....	766
Obituary .....	766
Architectural and Archaeological Societies .....	766
Competitions .....	767
Correspondence .....	767
Intercommunication .....	767
Legal .....	768
Legal Intelligence .....	768
Water Supply and Sanitary Matters .....	768
Our Office Table .....	769
Meetings for the Ensuing Week .....	769
Trade News .....	769
Tenders .....	770

## ILLUSTRATIONS.

MAER HALL, NEAR WHITMORE, STAFF.—INTERIOR OF MAER HALL.—"WINDERMERE," BLACKHEATH.—AN ARCHITECT'S HOME, BROOKLANDS, CHESHIRE.—CLARENCE STREET SCHOOL, SWINDON.—THE HAMMERSMITH SYNAGOGUE.—THE DOVER CASTLE HOTEL, WESTMINSTER BRIDGE ROAD.—STAIRCASE AND LOGGIA IN THE PLANTIN MUSEUM, ANTWERP.

## Our Illustrations.

## MAER HALL, WHITMORE, STAFFORDSHIRE.

THE two drawings illustrated herewith to-day are conspicuously hung on the line at the Royal Academy Exhibition this year, and they represent the extensive additions and alterations which the architect, Mr. J. Francis Doyle, of Liverpool, is carrying out for Mr. Frederic J. Harrison, the well-known shipowner at Liverpool. The mansion is really a very old place, and the foundations lately laid bare are in evidence as to its antiquity, while the "secret room" under the butler's pantry gives the charm of romance to its historical character. The estate is a large one of some 4,000 acres, and belonged to the Davenports. The mere or lake, of over 30 acres in extent, adds much to the interest of the beautiful surroundings of the house. The entrance porch and hall are entirely new. The site of this great hall was originally only a sort of central court for lighting the surrounding apartments. Whitmore has a station between Crewe and Stafford on the London and North-Western Railway. The same architect has two other large works in hand in the district of Crewe—viz., Sansaw Hall, towards Shrewsbury, and Houghton Hall, towards Chester.

## "WINDERMERE," BLACKHEATH.

THIS house is situate in Blackheath Park, with a garden on the southern side. There is a hall, three sitting-rooms, and billiard-room on ground floor; five bedrooms, dressing-room, and bathroom over, and servants' rooms in the roof. The materials are red Bracknell bricks, rough-cast, wood cornices, and red tiles. The house is being built for Mr. E. Merritt by Messrs. Holloway Bros., builders. The architect is Mr. Aston Webb, F.S.A., V.P.R.I.B.A., and the drawing we illustrate is hung at the present Royal Academy exhibition.

## AN ARCHITECT'S HOME AT BROOKLANDS.

THIS house has been erected at Brooklands, Cheshire. The walls are cavity walls, faced with grey ends, and quoined with Ruabon bricks to level of first floor, and ornamental red tile hanging above. The roofs are covered with Ruabon brindled tiles, the timbering of gables is stained with carbolinum. The dining-room ceiling is in sequoia wood left in its natural state, without stain or polish. The hall is finished with plaster between joists, which are also stained with carbolinum; the staircase has pierced carved balustrade. The chimney-pieces and overmantels are of hardwood. The accommodation provides a drawing-room, 18ft. by 16ft. 6in., a dining-room, 20ft by 14ft., and a large hall; on first floor are five bedrooms, linen-room, &c.; and on second floor are provided three bedrooms, box, and cistern-rooms. The house is

heated by the low-pressure water system. Mr. Frank W. Mee, of Manchester, is the architect, and the drawing from which our illustration was taken is on view at the Royal Academy Exhibition.

## CLARENCE STREET SCHOOLS, SWINDON.

THESE schools are being erected by the Swindon School Board on a site centrally situated in New Swindon, to meet the growing demands for additional school accommodation in the town. Local red bricks are being used, with moulded bricks and rubbers for the arches, and the dressings are of Bath stone. The roofs are covered with Broseley tiles. The floors will be laid with wood blocks, those to entrances and cloakrooms being laid with hydraulic tiles. Glazed brick dadoes are provided for these portions. The mezzanine floors will be utilised for the teachers' rooms. The school, which is intended for boys and girls, will, as a temporary arrangement, be also used for higher grade scholars until the erection of a school for this purpose, which is in contemplation. Accommodation is provided for 885 scholars. The halls, which are each 85ft. 6in., by 28ft., can be used when desired for lectures, meetings, and entertainments. The amount of the accepted tender is £9,276, which includes erection of latrines, outbuildings, and boundaries, also making of playgrounds. Mr. Charles Williams, of Swindon, is the contractor. Mr. William Drew, M.S.A., of Victoria-street, Swindon, is the architect, and Mr. Jas. Elsdon is the clerk of works.

## HAMMERSMITH AND WEST KENSINGTON SYNAGOGUE.

The original structure of the Hammersmith Synagogue was erected by Messrs. Chamberlen Bros., from the designs of the architect, Mr. Delissa Joseph, F.R.I.B.A., in the year 1890. The synagogue was so placed on the site, and so constructed, as to readily allow of its enlargement when the occasion should arise. Every seat in the present building having become occupied, the United Synagogue made a grant to the Hammersmith Synagogue of £2,133, with which to enable them to enlarge the building. The plans for the enlargement have been prepared by the architect, Mr. Delissa Joseph, and the contract has again been placed with Messrs. Chamberlen Bros. The enlargement comprises the construction of two aisles and side galleries, the extension of the apse, the formation of a clerestory, and the building of a second staircase, and this enlargement will double the capacity of the building, will provide total seating for 400, and will develop the structure from its former comparatively restricted character into a building of bolder proportions and of more architectural interest.

## DOVER CASTLE HOTEL.

THIS building is situated in the Westminster Bridge-road adjoining the Waterloo Station, and contains on the ground floor public, private, and saloon bars, together with a large grill-room and entrance to the hotel proper, which occupies the first and upper floors. On the first floor are large billiard, public dining-room, public sitting-room, office, &c. The second and third floors contain private dining-rooms, bed and sitting-rooms, &c. The kitchens and offices and staff rooms are on the fourth floor. Externally, the building is faced with Lawrence's red bricks, with Monks Park stone dressings, the bay window and oriel at corner being in glazed brickwork. The roofs are covered with green Westmoreland slates. The ground-floor front is faced with Norwegian granites, the plinth being in dark blue "Labrador" and the pilasters in red, with Corsehill stone caps. The internal joinery to ground floor is of American walnut, and the grill-room is also executed in the same wood. The pewtering was done by Messrs. Warne and Co., and the etched glass to windows and screens by Messrs. W. James and Co. The billiard-room decorations are in oak, the public dining-room being carried out in dark oak. The general contractors for the building were Messrs. L. Whitehead and Co., of Clapham, and the Monks Park stone came from the quarries of the Bath Stone Firms, Ltd., of Bath. The whole of the works were carried out from the designs and under the superintendence of the architects, Messrs. Treadwell and Martin, of 2, Waterloo-place, Pall Mall, S.W., for the owner, Mr. C. Best.

## STAIRCASE AND LOGGIA, PLANTIN MUSEUM, ANTWERP.

Our illustration shows the Loggia at the N. side of the courtyard of the Plantin Moretus Museum.

Entrance to it is obtained through the doorway seen on the left; the approach from the Place Vendredi, in which the building stands, being through two or three rooms containing the furniture, pictures, &c., left by the celebrated printers whose names are identified with the museum. The building, indeed, was formerly their mansion and printing office, and the presses and library are still remaining. The quaint staircase serves as the principal one of the house, the return flight, as shown, being screened and supported by the rich piece of carved woodwork. The balustrade with its square balusters terminate in an ornamental newel with Ionic pilasters, surmounted by an heraldic lion holding a shield. The staircase bears the date 1621, and was carved by Paul Direckx. We are indebted to the *Moniteur des Architectes* for the engraving from which our sketch is made. Illustrations of other portions of this celebrated and interesting example of the style of Henri II., appeared in our issues of Jan. 6, 1884, and Jan. 25, 1895.

## CHIPS.

At their last meeting the town council of Bolton agreed to adopt overhead electric traction for the trams on the system in operation at Walsall. It was reported to the council that while the cost of electric trams was 4½d. per car mile, that of horse-traction averaged over 9d. per car mile. They resolved to try the system on the Daubhill section in Bolton at a cost of £10,050, or £4,000 per mile. The total length of lines owned by the corporation is 17 miles 1,074 yards, but the Daubhill length, a very hilly district, is only for the present to be worked on the new principle. The power will be supplied from the electricity works of the corporation.

The will of Miss Julia Emily Gordon, of 28, St. John's Wood-road, has been proved, the value of the personal estate amounting to £73,339. The testatrix bequeaths the portrait of Mrs. Siddons, by Sir Thomas Lawrence, and all her framed pictures, prints, &c., to the National Gallery, Trafalgar-square, and all her ornamental china, carved oak, stones, coins, fossils, Bermuda agates, books, &c., to the South Kensington Museum, on the condition that they are formed into a "Julia Gordon Collection."

Mr. Rienzi Walton, one of the inspectors from the Local Government Board, held an inquiry at St. Helen's, Lancs, recently, into an application by the corporation for sanction to borrow £9,350 for public works and improvements, including £2,600 for laying new water mains, £2,000 for gas mains extension, £1,500 for works of sewerage and sewage disposal, £1,350 for works of storm water drainage, £1,050 for purposes of public abattoirs, and £850 for works of street improvements.

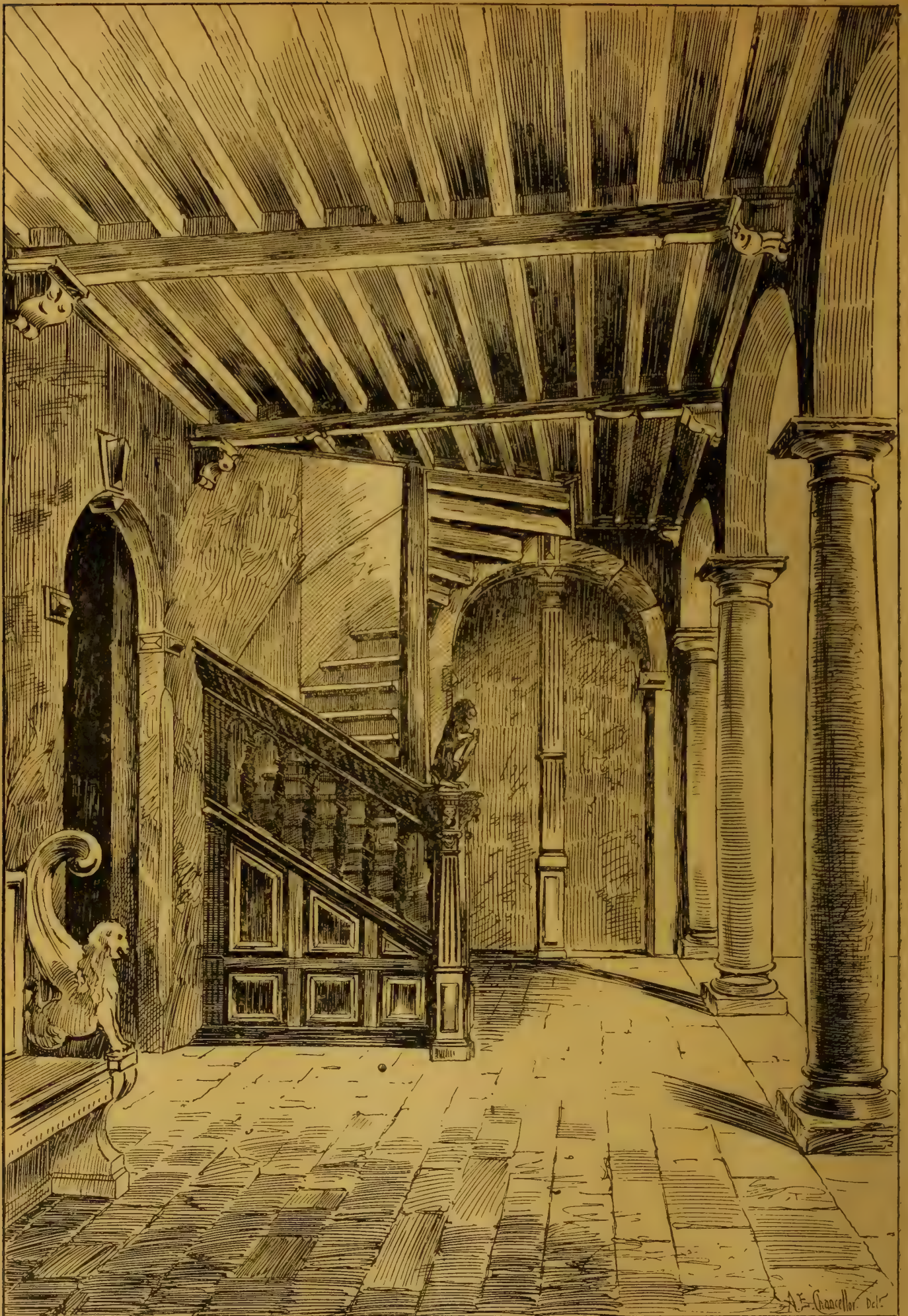
The local board for Felixstowe, having received the sanction of the Local Government Board to the borrowing of £1,900 for the purchase and laying-out of land on the cliffs, have instructed their surveyor, Mr. G. S. Horton, to make plans for preparing the site for use as a public pleasure-ground, and to obtain orders for the erection thereupon of one large and four small shelters, as well as seats and lavatories.

The laying of the lines of electric tramways at the south end of Douglas, Isle of Man, is practically finished. The building to contain the tramcars is finished, and the power station will shortly be completed. The three new steel bridges are on the ground, and one is erected in position, the other two being well advanced. All works are being pushed forward with a view to opening the lines for traffic in June. The present terminus of the lines at the south end of the Marine Drive is at the commencement of the footpath leading to Port Soderick, to which place it is proposed to extend the tramways at the end of the coming season.

The Mayoress of Chester laid, on Tuesday, the foundation stone of the electric-lighting works for that city. The site of the works is on the Crane-street side of the Tower Gardens (that is on the Welsh side of the city walls, almost opposite the General Infirmary), and the works are to cost £22,000. It is expected that the new light will be installed in Chester in October.

The 101 plots of freehold building land constituting what is known as the Cumberland-place condemned area, Brighton, were disposed of by public auction at the Sale Rooms, Ship-street, Brighton, on the 6th inst., by Mr. Frederick Cecil Parsons, F.S.I., of Messrs. Parsons and Sons, auctioneers and estate agents, 163, North-street, in accordance with the instructions of the Brighton Town Council. There was a very large attendance. The competition throughout was spirited, every lot being sold and good prices being realised, the total amounting to £10,134—a sum greatly in advance of the estimates named during the discussions in the council-chamber.





STAIRCASE & LOGGIA AT THE PLANTIN-MUSEUM ANTWERP







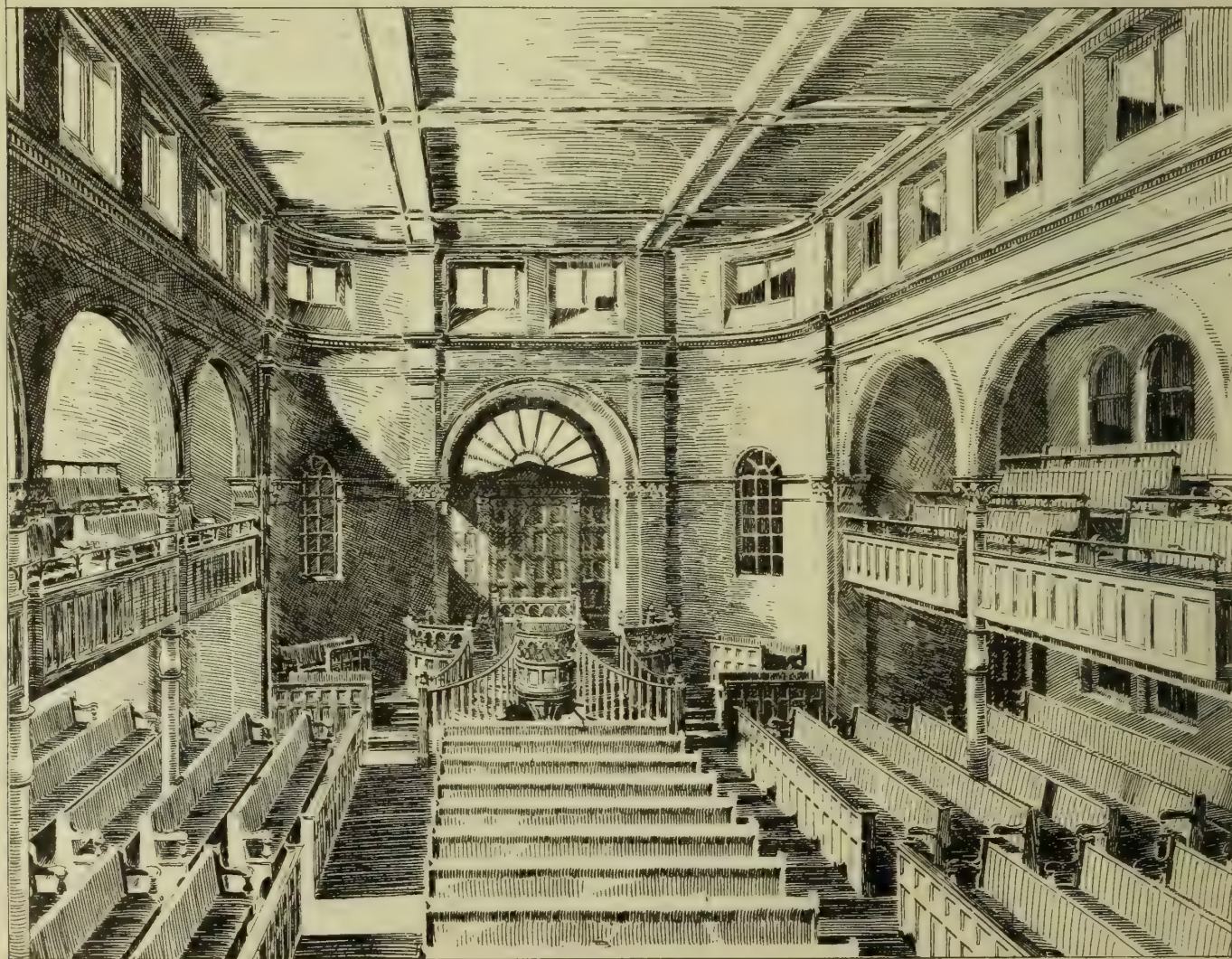


Photo. Lithographs & Engraving by James A. K. & Co. 6, Queen Square, W.C.

The Hammersmith Synagogue.

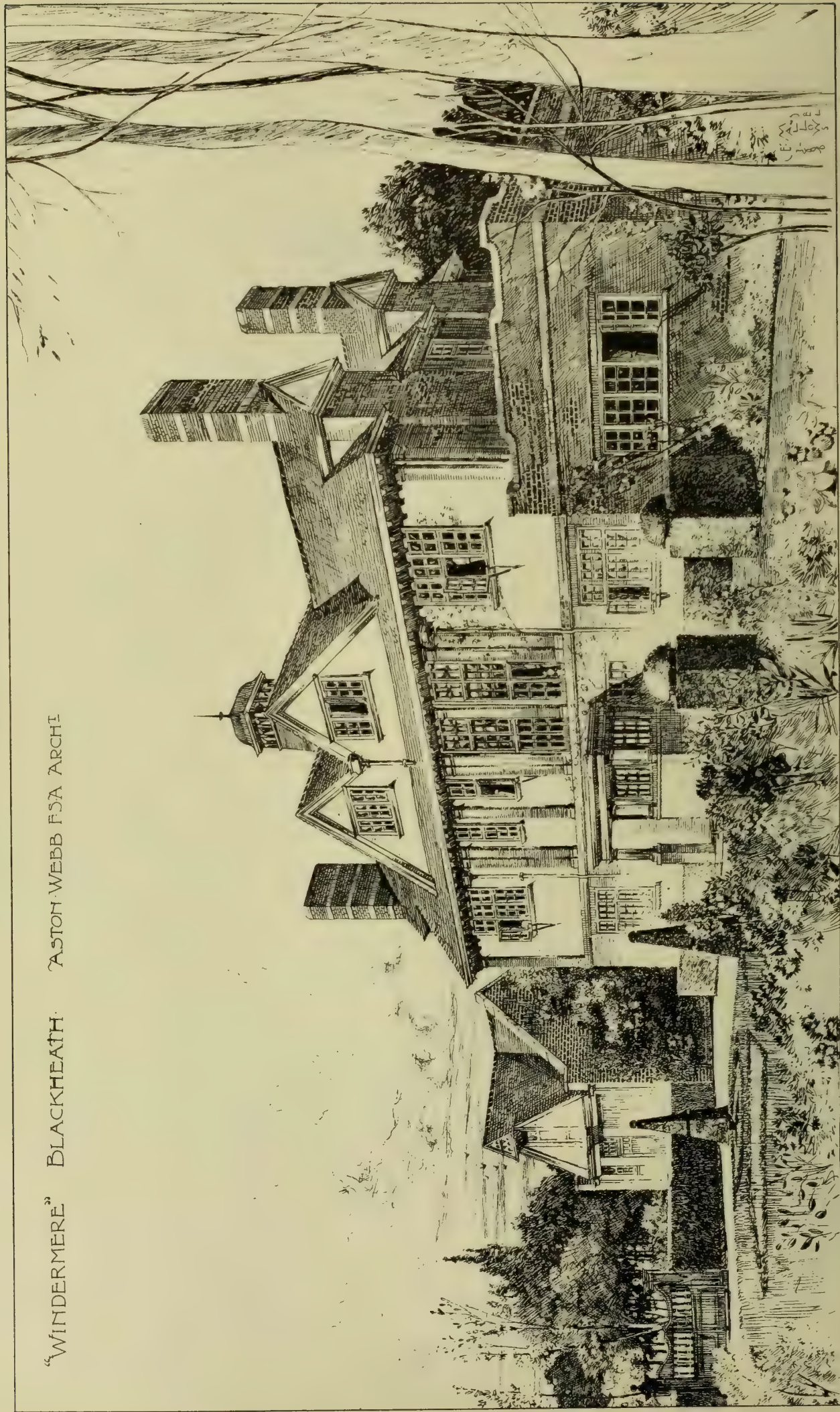






THE BUILDING NEWS, MAY 22, 1896.

"WINDERMERE" BLACKHEATH. ASTON WEBB F.S.A. ARCHT.

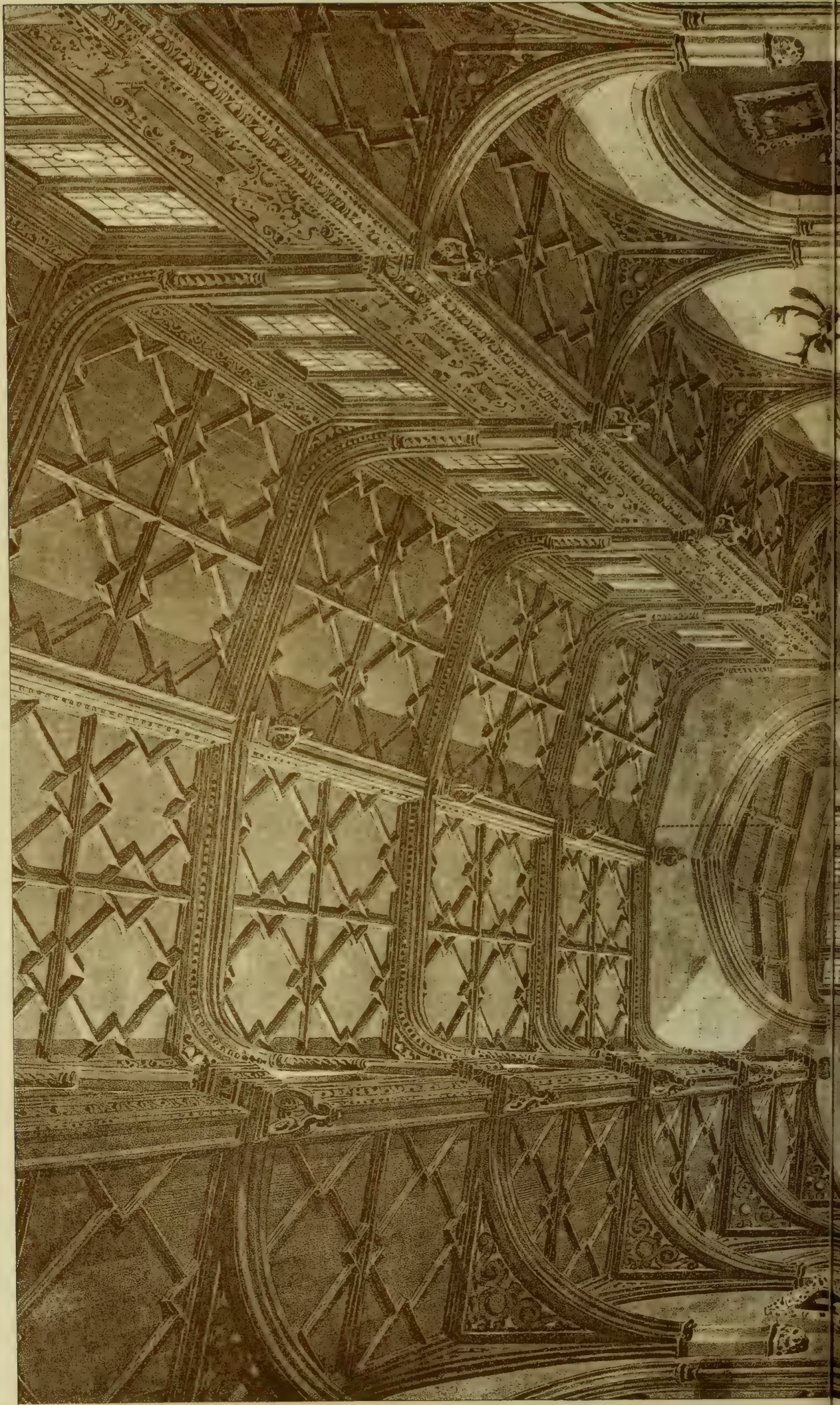








THE BUILDING DEWS, MAY. 22, 1896.





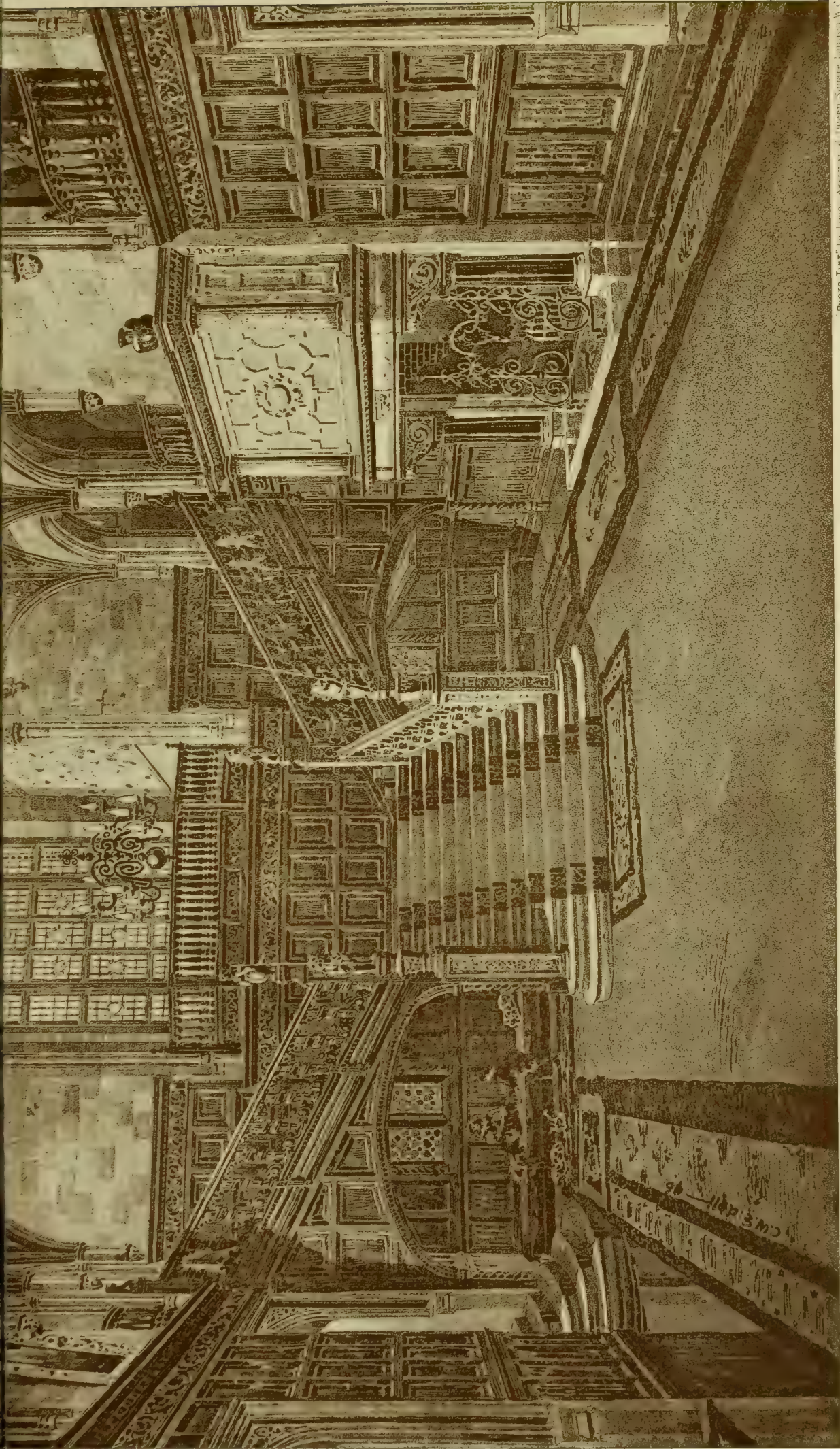


PHOTO-TYPE by James A. Kermack, of Queen Square, London, W.C.

MAER HALL NO. 8 WHITMORE · STAFFS · ALTERATIONS & ADDITIONS · J FRANCIS DOYLE ARCHT  
INTERIOR OF THE GREAT HALL









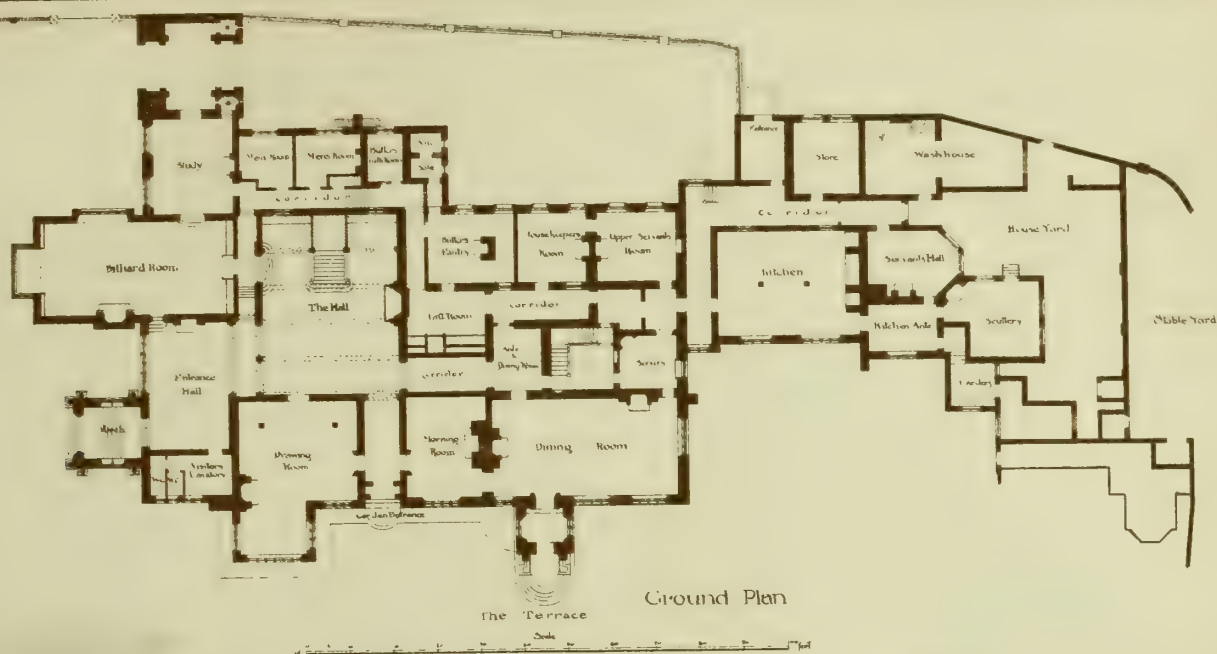


## MAER HALL NE WHITMORE · STAFFS · ALTERATIONS &amp; ADDITIONS · J. FRANCIS DOYLE





ARCHT





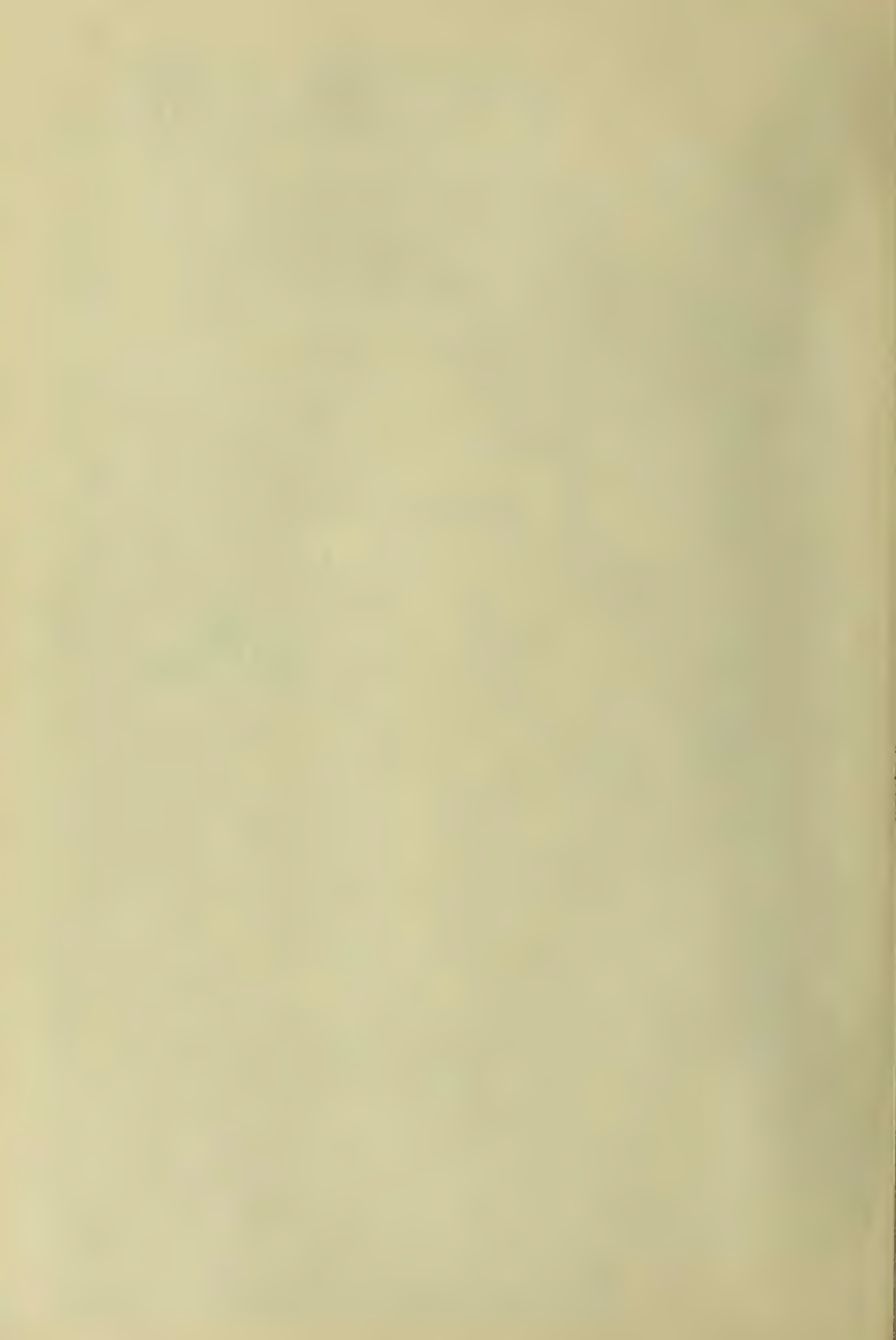




This is a detailed black and white architectural engraving of a large, multi-story house. The house features a complex roofline with multiple gables and a prominent central chimney. The facade is adorned with numerous windows, including large bay windows on the ground floor and smaller, multi-paned windows on the upper floors. The house is surrounded by dense foliage, including trees and shrubs, which are rendered with fine lines and cross-hatching to create a sense of depth and texture. The overall style is characteristic of 19th-century architectural illustrations, with a focus on detailed line work and shading. The engraving is oriented horizontally, with the house's front facade facing the viewer. The background shows a continuation of the landscape with more trees and a fence line. The entire image is framed by a simple border.

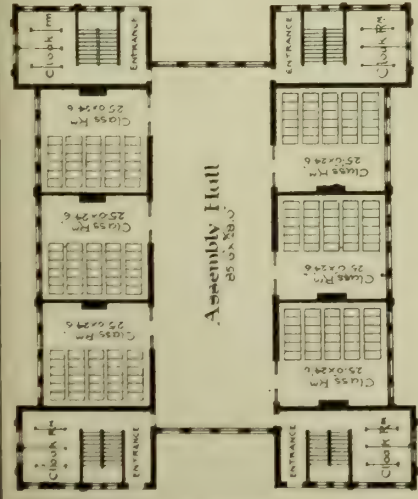
Phreatophila ...



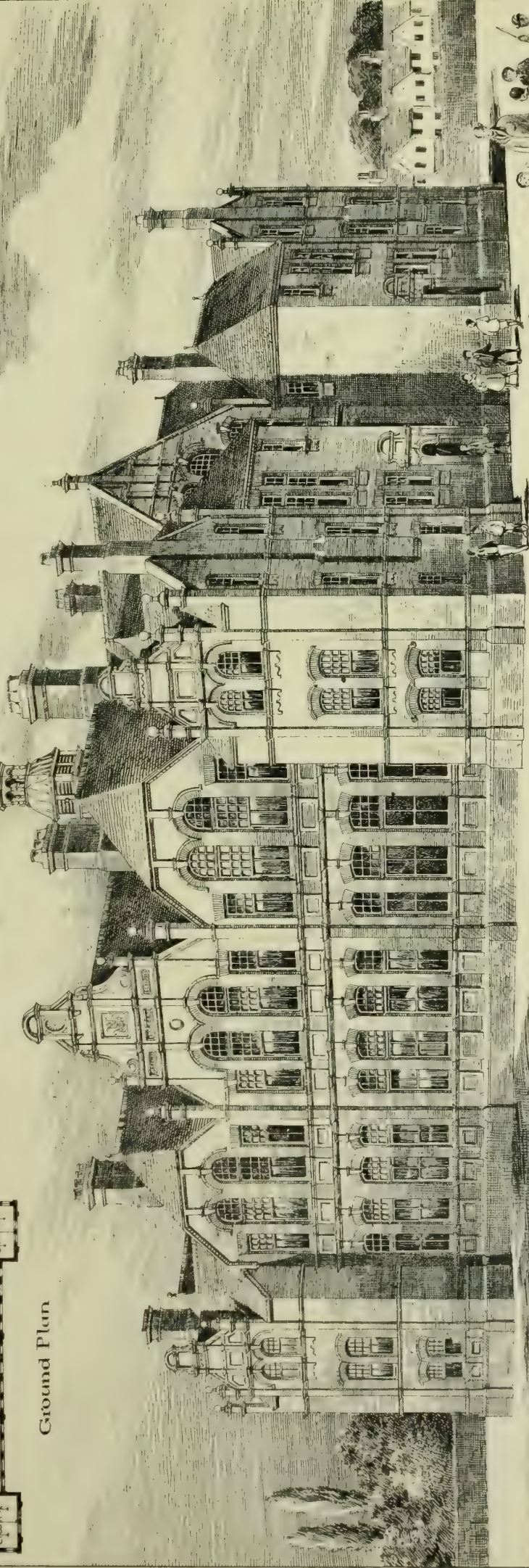




CLARENCE STREET SCHOOL  
SWINDON  
for the SWINDON SCHOOL BOARD  
William Drew MSA  
Architect



Ground Plan









THE DOVER-CASTLE HOTEL  
WESTMINSTER-BRIDGE-ROAD S.E.  
MESS<sup>RS</sup> TREADWELL & MARTIN ARCH<sup>T</sup>S





## Building Intelligence.

**CROYDON.**—The Prince and Princess of Wales visited Croydon on Tuesday for the purpose of opening the new town hall, courts of justice, and free library, which has been erected at a cost of about £100,000. The foundation-stone of the municipal buildings, which occupy the site of the long disused Central Railway Station, was laid in June, 1892, and the fabric was virtually completed during the summer of 1895, since when the internal furnishing and arrangements have been proceeded with. The chief materials used in construction of the exterior of the buildings are red brick, with Portland stone for the dressings, and green Westmoreland slates for the roof coverings. The principal front, 285ft. long, faces north to Katharine-street; at the east end is a return of 170ft. to a new street in prolongation of Fell-road. This again has a return, facing south to Mint-walk; and beyond it a space of about 90ft. square is left uncovered, with a roadway giving access for carts to the weights and measures department. The block containing the corporation offices extends 160ft. from the New-street towards High-street. A central feature of the group is a square clock-tower, finished with a domical copper-covered roof. Mr. Charles Hensman, whose design was selected in competition, and was illustrated in our issue of June 3, 1892, is the architect. The whole of the mosaic work, and the marble mosaic pavements to entrance-hall and first floor landing were executed by Messrs. Burke and Co., of Newman-street, W., and Paris.

**GOLCAR.**—The foundation-stone of new schools, in course of erection for the Golcar School Board in Crow-lane, was laid on Saturday. The school, which comprises mixed and infants' departments, will have a central hall, 54ft. 3in. by 32ft., and five classrooms, two classrooms accommodating 50 children each, and three classrooms for 40 children each, while 60 places are provided in the central hall. In the infants' department, the principal room will accommodate 86 children, and a classroom for 60, making a total of 426 places in both schools. The accepted tenders amounted to £4,304 18s. 6d., being £10 2s. per head without the places provided in the woodwork and cookery rooms. The architect is Mr. Joseph Berry, of Queen-street, Huddersfield.

**LIBERTON, NEAR EDINBURGH.**—The foundation-stone was laid by Archbishop Macdonald on Tuesday, of a convent at Liberton, for the community of nuns known as the Poor Clares Colettines. Eventually the institution will consist of a quadrangular building, three sides of which will provide accommodation for twenty-seven nuns, while a church will form the fourth side. Owing to want of funds, only the north wing is at present to be built. It comprises a two-storied building, with a house for the chaplain at the west end. The wing will be about 150ft. long and 36ft. high, and until the church is built one of its rooms will be used for the celebration of mass and for other services. The plans for the church show that it is to include a choir, 35ft. long by 25ft. wide, for the cloistered nuns, divided from the portion set apart for the general public, which will be of similar dimensions. Inside the church the height will be 28ft. Separate altars are to be provided for the two chapels. Each end of the church will have a rose window. Craigmillar stone is to be used throughout the convent buildings for the walls, and Dumfermline stone for the dressings, while the roofs are to be of Velineli slate of greenish tint. The style is Gothic, severely plain in treatment. The site is on the Lasswade-road, beyond the Industrial School. The space facing the road and the centre of the quadrangle are to be laid out as gardens. The north wing will be ready for occupation about Easter of next year. The plans have been prepared by Mr. A. E. Purdie, F.R.I.B.A., London; the contractor for the work is Mr. John Lownie, Gilmore Park, Edinburgh; and the clerk of works is Mr. F. Colbourn, London.

**TODMORDEN.**—Corner stones of a new chancel for St. Mary's Church were laid with Masonic ceremony last week. Besides the chancel, the new works include, on the same level, an organ-chamber and clergy-vestry to the south, and underneath the chancel a choir-vestry, 21ft. square, a heating cellar, and church cleaner's closet. It is hoped that eventually there may be a new nave. The new chancel will be 28ft. long and 21ft. wide inside. The east window is of

three lights, with a traceried head; this window is to be filled with stained glass as a memorial. A new font has been placed in the nave. The walls of the new buildings are faced outside with Hipperholme wall stones, with dressings of Halifax stone. The floor of the chancel will be tiled, the vestries and organ-chamber will have wood-block floors. The roof will be covered with the grey stone slates of the district. The work is being carried out under the superintendence of Mr. Medland Taylor, of Manchester, the architect, without the assistance of a clerk of works.

### CHIPS.

The private view of the Royal Cambrian Academy will take place to-morrow (Saturday) at Plas Mawr, Conway, when the public will have an opportunity of viewing the pictures in the gallery which was added to the building in February last.

The third general meeting of the Royal Society of Antiquaries of Ireland for the year 1896 will be held in the Ulster Hall, Omagh, on Monday, 8th June, at 12 o'clock noon. In connection with this meeting, a series of excursions have been arranged to places of interest in co. Tyrone, Enniskillen, Lough Erne, Devenish Island, Belleek, Ballyshannon, Bundoran, Grange, Clifton, Drumcliff, and Sligo. Carrowmore, Knocknaree, and Lough Gill will also be visited. The excursions will extend from Monday, 8th of June, to Saturday, 13th of June. On Monday, 3rd August, an excursion will be made to places of interest in King's County.

A conference has taken place in the Glasgow Building Trades Exchange between the representatives of that body and the Glasgow Landlords' Association to consider the advisableness of testing the legality of the action of the City Improvements Trustees in the extensive building schemes in which they are at present engaged. It was resolved, as a preliminary step, to take the opinion of counsel on the matter.

The Bishop of Southwark has solemnly blessed and laid the foundation-stone of the new Church of St. John the Evangelist, now in course of erection at Herons Ghyll, near Uckfield, from the designs of Mr. Frederick A. Walters, F.S.A., of Westminster.

The county councils for West Suffolk and Essex have adopted plans prepared by Mr. F. Whitmore and Mr. Sheldon, the county surveyors to the respective authorities, for a new highway bridge over the Stour at Boxsted, at an estimated cost of £4,100.

Some thirty of the members of the Yorkshire Association of Students of the Institution of Civil Engineers visited York sewage works a few days ago at the invitation of Mr. A. Creer, A.M.I.C.E., the city surveyor of York.

The new church at Kea, near Truro, erected from the designs of Mr. Geo. H. Fellowes Prynn, is now all but completed, and is to be consecrated on Monday, June 4, by the Bishop of Truro.

The Art Gallery of Aberdeen has been enriched by a bequest of pictures by the late Mrs. Duthie, of Cairnbulg, comprising two water-colour paintings of Ballater; engravings of the poets of Italy by Raphael Morghen, of Florence—engravings which have become rare; painting of roses, by Miss Marion Chase, R.A., London; engraving of Lady Martin (Helen Fancit), of which only twelve were published; "The Emperor Napoleon in Coronation Robes," by David; painting of a lady, believed to be of a Scottish family, by Sir Peter Lely; painting, "A Landscape," by Thomson; and several scarce engravings.

The new organ case for Tickhill Church, designed by Mr. J. Oldrid Scott, F.S.A., has been made by Messrs. Brindley and Foster, organ builders, Sheffield. The carving, which includes tracery, brackets, and cresting, being from the works of Messrs. M. Tuttle and Son, sculptors, Lincoln. Oak framing, with carved sequoia wood panelling, being used; the effect is pleasing.

The new Cronniwell sewage disposal works, which have been constructed by the Blaydon and Lanchester District Councils, have been formally opened. Two years ago, sewers were laid by the Lanchester Rural Authority for the drainage of the villages of Cronniwell, High Westwood, part of Allendale Cottages, Lower Westwood, Derwentside, and works are now being constructed for the drainage of Blackhall Mill. An arrangement, the invention of the Adam's Patent Sewage Lift Co., York, has been introduced, by means of which the sewage from the high-level sewers is utilised as a motive power for the low-level (or Blackhall Mill) sewer. The sewerage works comprise a store-house and mixing-tank, sand-washer, two precipitating-tanks, and filters in four separate compartments, one sludge-tank, and lift to raise the sludge a height of about 10ft., when it then discharges on to the sludge drying beds. The scheme has been carried out by Mr. G. H. Bell, contractor, of Bishop Auckland, under Mr. Parker's personal supervision.

## Engineering Notes.

**ELECTRIC RAILWAY FROM THE CITY TO ISLINGTON.**—A Select Committee of the House of Commons, on Monday, passed the preamble of the Bill promoted by the City and South London Railway Company for an extension of time until August, 1901, within which to construct and complete their authorised extension to Islington. This Bill has been opposed by the trustees of the church of St. Mary Woolnoth, which the company, by their Act of 1893, were empowered to acquire and pull down. As the result of this opposition the committee stated that they would require a clause to be inserted for the preservation of the church; but the arbitrator, in assessing the compensation for a right of easement under the church, is to take into consideration the value of the rights which the company acquired in 1893 to take down the church, but which rights are now to be taken away.

Mr. Bayard, the American Minister, will lay the memorial stone of a Congregational church, in memory of John Robinson, one of the Pilgrim Fathers, at Gainsborough, on June 29. The cost of the church is estimated at £6,000.

The carving in red sand brick for the new Constitutional Club at Lincoln is now completed; the main feature being five large panels, the centre containing the Royal Arms of the Union; the others represent England, Ireland, Scotland, and Wales. In each panel the flowers or emblems of the special country have been introduced, thereby giving extra meaning to the work, which is boldly treated and distinct. Mr. W. Watkins, F.R.I.B.A., who is the architect for the building, has intrusted this work to Messrs. M. Tuttle and Son, architectural sculptors, of Lincoln.

The first stage in the Great Tower at Wembley is to be opened to the public on Monday. It is an acre in extent at 155ft. from the summit of the hill on which it stands, which itself is 250ft. above sea-level. It is reached by four lifts, each taking fifty-five persons at a time. At each angle of the platform there is a square shelter-room, and a gallery, well caged in, runs parallel along each side, forming a promenade. Sir Benjamin Baker was the engineer, and Mr. Heenan the contractor. The grounds have been laid out by Mr. Milner.

The House Committee of the U.S. Congress on Public Buildings and Grounds has reported favourably on a pending Bill "for the securing of plans and for the erection of the public buildings of the United States," with some amendments relating to the details of the conduct of the public building business, and the way in which the records shall be kept, and one providing that a civil engineer shall be substituted for an army engineer in the commission provided for by the Bill. With these amendments, the committee recommends the passage of the Bill.

The Board of Trade memorandum on the state of the skilled labour market states that during April the general state of employment continued to improve, and that at the close of the month the proportion of unemployed in trade-unions making returns was lower than at any time since June, 1891. Employment in the building trades has further improved, the percentage of unemployed in unions making returns being 1.5 compared with 2.6 in March, and 3.3 in April, 1895. The furnishing trades remain busy, the percentage of unemployed union members having fallen to 0.9, compared with 1.0 in March, and 3.1 per cent. in April, 1895.

The ceremony of dedicating and opening the middle-class girls' school, at Boston, Lincolnshire, erected in the new street extending from Red Lion-street to Norfolk-street, was performed by the Bishop of Lincoln on Wednesday week. The schools, which provide accommodation for 120 scholars, have been erected by Messrs. H. W. Parker and Son from plans prepared by Mr. J. Rowell. The cost has been about £1,000.

Messrs. Fambrini and Daniels, architectural concrete works, Lincoln, have secured the contract for replacing balcony to the Borough Hall, Stafford, for the estates and works committee of the town council. The new balcony will consist of a series of circular columns on moulded bases with modelled caps, pierced parapet, and moulded capping. A heavily moulded and incised cornice will form the base, the whole being supported on large moulded corbels.

The local Salvationists last week opened the new citadel, erected on the London-road, at the corner of Rycroft-street, Grantham, at a cost exceeding £1,500. The building consists of a large and small hall; the former will accommodate 800 persons, and is for the ordinary meetings of the Army, while the latter is especially fitted up for children's services. The architect was Major Gordon, of London.



## CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXIII.

By JOSEPH HORNER.

FIG. 77 shows the fluted shaft of a column in cross-section. It is a favourite form in cast iron, because, though ornamental, it is not so difficult to make as many other forms are. Shallow flutes are easier to mould than deep ones; but they suffer through lack of relief, and do not look so well. The flutes in Fig. 77 are



FIG. 77.

deep, but quite mouldable. In Figs. 78—80 views are given of a portion of the pattern in which such a fluted shaft occurs. Fig. 78 is an external view of the base, and the lower portion of the shaft adjacent. Fig. 79 is a corresponding half of the pattern open in the joint-face, and Fig. 80 is a cross-section through the fluted portion of the pattern. Whatever the form of the capital, the pattern flutes terminate in the manner shown in these figures, and there is, therefore, no need to illustrate the upper portion of the column.

Comparing the three views, it is seen that the lagged-up portion, A, of the pattern, lagged on the cross-bars B B, is made distinct from the fluted portion; neither is it turned. It is simply a basis upon which the fluted portion is laid and held while being turned and moulded, and which lagged basis is taken out of the mould first, leaving the fluted portions behind, to be withdrawn in sections. The flutes are shown in six separate strips in the figure; but it might happen that eight or ten strips might be required. In Fig. 81 eight would be necessary. The reason is clear. After the lagged body A is withdrawn, the outermost strips C C C C each have to be slid

the centre basis is regulated entirely by the divisions in the fluted strips. It is often necessary, in order to effect this withdrawal of strips, to make their joint edges other than radial. This is the case in both figures, a brief study of which will render the reasons of the several joints there



FIG. 79.

shown clear. It is also desirable, as far as practicable, to make the joints run, not through the flutes, but through the metal between the flutes. The reason is that any slight overlap of joints left in the casting can be more readily chipped and filed off there than within the flutes.

The plain lengths of fluting in the pattern are worked through with a round plane after the outside has been turned. The terminations are cut with a gouge. To permit of working the flutes right through, the end portions are cut in separate pieces, *a*, Figs. 78 and 79, screwed to the major lengths, these being removed while the planing-out is being done.

The manner of attaching the moulded base to the lagging A is clear from Figs. 78 and 79. It is fitted round the flat faces of the lagging in



FIG. 78.

out under the coercion of the edges of the adjacent strips C' C'—that is, in the direction of the arrows *aa*—and the fluted edges, which are most unfavourably placed for withdrawal, must not be undercut in relation to the joint edges of the strips C' C'. This is indicated by the lines *cccc* in Figs. 80 and 81. That is the essential point which has to be observed in arranging the number of fluted strips around a pattern. The shape of

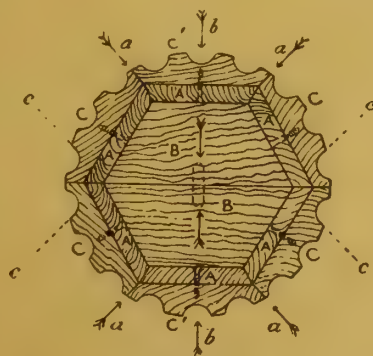


FIG. 80.

three thicknesses, for convenience, and the mouldings are turned in place. These remain permanently on the pattern, but the fluting strips, which abut against this by the joint *aa*, are held temporarily by means of screws put in from the inside of the pattern, seen in Figs. 79-81, to be removed at every occasion of moulding.

P is the core-print, in this case conveniently screwed on the pattern end. The outline of the core is dotted in Fig. 79, and the core-board is made similarly to those illustrated in the two previous articles. When columns are fluted, the cores are always made circular, as seen in Fig. 77. This may seem opposed to what I have already insisted on in reference to the necessity for maintaining approximate uniformity in thicknesses of adjacent metal. But the symmetry of the casting

prevents any evil results. If, for example, it were fluted round one half and plain round the other, the result would be a crooked casting. Not so when the sections are regular all round. Besides, the mass is not great, the disparity in mass is not great, neither are there any sharp angles, and shrinkage stresses are absent. The same remark applies to the section of the octagonal column in Fig. 82. In fact, it would not be economically practicable to make cores to follow the outlines of flutes and flats. Almost the only

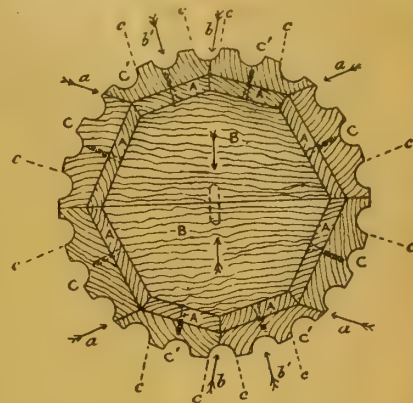


FIG. 81.

exception to the use of circular cores in columns is that of Corinthian capitals, for which, when of large dimensions, and having the foliage cast on, a special half core-box is made. If such foliage stands out very much, it is better to cast it in separate pieces, and screw it on a plain cast column. Apart from the difficulty of moulding them, they cannot be satisfactorily lightened out by coring, except by making a core-box, which in such a case is costly; and without such a box, heavy lumps adjacent to lighter portions of the column are apt to produce shrinkage strains, and draws.

Fig. 82 is a favourite type of column, in which a portion of the base is usually imbedded in the ground, the bottom flange being joggled into a



FIG. 82.

foundation-stone. Mouldings and shafts are octagonal throughout, only the top and bottom flanges being square. Such a pattern is easily made from solid stuff, if of small dimensions; if large, it is lagged up similar to the centre part in Figs. 78-80, and the mouldings will be glued around the flats of the shaft.

When holes have to be cast in column flanges, as sometimes happens in the top flanges to receive



the bolts for rolled joists, round prints must not be nailed on, but pocket prints. Fig. 83 shows a face view of such a flange, with its prints, *a, a*. The radius at the end of each print is the same as that of the core which has to be inserted, and the dotted arc shows the completion of the circle of the cores. If, however, a piece like Fig. 84 is prepared and given to the moulder, that will serve his purpose as well as prints. The curved ends of the two recesses correspond in positions and dimensions with arcs of the round cores, which are guided into place by means of the "stopping-over piece," as it is termed. The

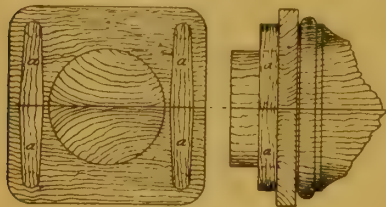


FIG. 83.

thickness of the piece is quite immaterial, so long as it is less than that of the flange impression into which it has to be dropped.

If the length of column castings has to be shortened from time to time, the diameter remaining the same, then there is no need to cut the pattern off to suit each length of casting required. If the pattern flange is screwed on the body of the pattern to correspond with the length of the casting required, and the moulder is informed that the casting is to terminate there, he will fill up or "stop-off" that portion of the mould which lies beyond the flange.

Descriptions of anything more elaborate than the examples given would lie beyond the special scope of these papers. The foliated columns of the Classic orders can only be made by specialists. Even an ordinary pattern-maker or founder cannot successfully tackle them, and they are quite

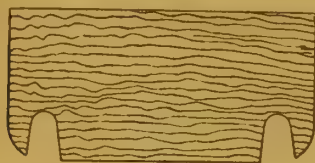


FIG. 84.

beyond the craft of the carpenter. There are some elaborate forms which cannot be moulded and cast on the column, others which require dozens of jointings in the pattern, and the loose pieces have to be taken from the mould at all angles, and all the major joints have to be foreseen, and made before any portion is carved. But though a builder cannot manage this work, he can make a plain or fluted column up as far as the commencement of the capital, and buy a cast capital to surmount it, and that in many instances it may be worth his while to do.

#### CAUSE OF DAMP AND DECAY IN MASONRY.

A VERY useful brochure on the Cause and Cure of Damp and Decay in Masonry has been issued by Messrs. N. C. Szerelmey and Co., being the fourth edition of their well-known work on the subject, containing a supplement, with information and reports on the corrosion of iron and its remedy. We have noticed the previous editions of this little book, in which the authors point out the cause of damp walls as depending on the change of temperature. All stone and brick walls, as shown, absorb moisture from the atmosphere, and a wall built of absorbent materials is always damp, even in a dry atmosphere. Decay in stone is caused by dampness and the agencies which moisture introduces into the stone. It is needless here to point out the well-known remedy known as Szerelmey's process, and how successfully Colonel Szerelmey applied his experience and mode of operation to the stonework of the Houses of Parliament. The trials and tests made by eminent experts, such as Faraday, Murchison, Barry, proved the value of this process. Since then considerable progress

has been made, and a new product has been the result of the accumulated experience. The liquid known as "Szerelmey's stone liquid No. 101" has been found to interpose a waterproof layer between the wall and atmosphere, and hence to effectually prevent the cause of decay. Some very useful advice is given in this book, the authors remarking how futile it is to treat the inside of a wall for the purpose of curing damp coming from the outside. The Szerelmey Stone Liquid can be laid on the outside of the wall with a common brush. No skilled labour is necessary. As the liquid fills the interstices of the stone no damp can enter while the particles of the stone are coated with the liquid, which is impervious to moisture, acid, and alkali, and is, in fact, a perfect waterproofing process. The practical information given, directions for using the liquid, and the reports describing the success of its application to various buildings, damp brick and stone walls in various parts of the kingdom ought to be read by all who have any interest in the subject. Many buildings of stone and brick have been spoilt by painting, which could have effectually resisted damp and decay by a timely application of the present Szerelmey process.

#### OBITUARY.

The death has just occurred of Mr. ALBERT VICARS, architect. He was born at Lincoln in 1840, and was articled to Mr. Michael Drury, of that city. On coming to London he was engaged for some years with Mr. G. A. Dean, and about 20 years ago started in practice at Somerset Chambers, 151, Strand. He was well known as an architect of Roman Catholic churches, amongst which are St. Joseph, Highgate; Sacred Heart, Herne Bay; St. Michael, Wareham; St. Hugh, Lincoln; St. Mary, Leek; St. Anne, Birmingham; and St. John, Balsall Heath. In company with the late Mr. J. O'Neill he competed for the Brompton Oratory; he also designed the decorations of the first church of St. Joseph, Highgate, and a large number of altars. Some of his other buildings are St. Mary-le-Strand parish hall and library, St. Aloysius Schools, Highgate; No. 8, Great Portland-street, St. John's Lecture Hall, and Girls' Collegiate School, Forest Hill; Horniman's warehouse, Wormwood-street; and alterations and additions to Bracebridge Hall, Lincoln.

THE REV. JAMES RAINE, D.C.L., Chancellor and Canon of York, and a well-known archaeologist, died at his residence in York on Wednesday. He was the son of the late Rev. Dr. Raine, of Durham. The museum of the Yorkshire Philosophical Society received a great deal of his care and attention, and his death will be an irreparable loss to that body. Apart from his active researches, he made valuable contributions to archaeological literature, and as secretary of the Surtees Society since its formation, he edited many of the volumes issued by that society.

The public baths on the Western Shore at Southampton were reopened on Monday, after enlargement of the slipper baths departments and other improvements, carried out for the corporation by Mr. H. M. Ashton, contractor, of Bevois Town.

The memorial-stone of a new Board School which is being erected in Varna-street, Openshaw, near Manchester, was laid on Saturday. The school, of which the architects are Messrs. Potts, Son, and Pickup, consists of two blocks. In the larger block is accommodation for 900 boys and 600 girls, room for 500 infants being found in the smaller block. As the total numbers of scholars that can be accommodated is 2,000, it is the largest school that has been erected by the Board. The total cost has been about £23,000.

Colonel Marsh, R.E., Local Government Board inspector, held an inquiry at the town hall, Maidstone, on Friday, with reference to the application of the town council for a further technical school building loan of £1,300, and for permission to sell the Mitre Hotel and tap. The town clerk explained that a total sum of £13,073 10s. had been expended on the buildings, and that if the council were permitted to contract a further loan of £1,300, their whole account would be squared.

The dedication ceremony took place on Sunday at the opening of the new church of St. Patrick in Main-street, Coatbridge. The building occupies the site of the old church, at the corner of Main-street and St. John-street, and has been erected from plans by Messrs. Pugin and Pugin, of London. It consists of chancel, nave, aisle, and baptistry and sacristy. The building accommodates 1,000 people, and the entire cost will be £10,000.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—On Saturday afternoon, the members of this association held an excursion meeting at the offices of the *Newcastle Chronicle*. The visitors, who included the president (Mr. Archibald Dunn), the secretary (Mr. A. B. Plummer), and many others, were conducted over the buildings by Mr. Joseph Reed, and were furnished with a description, prepared by Messrs. Oliver and Leeson, the architects of the new building. The buildings occupy a site opposite the Stephenson Monument in Westgate-road, occupying a piece of ground in the form of the letter T. The ground-floor frontage facing Westgate-road is occupied by the general office, which is divided into compartments by carved oak screens, with Rose Royal marble dadoes and Pavonazzo and Sienna marble chimney-pieces with Pavonazzo overmantels. Behind the general office is a corridor leading into the printing and machine-rooms. At the rear a large addition has recently been made by Messrs. Kirk and Brown, contractors, of premises four floors in height. This building is faced throughout with ivory-coloured glazed bricks, and the ground-floor windows are protected on the outside with wrought-iron grilles. On the first floor above the machine-room is the compositors' room, now principally occupied with Linotype composing machines, 26 in number, and on two floors above are the reporters' and clerks' rooms. At the close of the visit a hearty vote of thanks was passed to Mr. Joseph Cowen, the proprietor of the journal, and Mr. Reid on the motion of the president.

#### CHIPS.

Colonel A. G. Durnford, R.E., one of the Local Government Board Inspectors, held an inquiry at King's Norton on Friday into an application made by the rural district council for sanction to borrow £4,850, for purposes of sewerage and sewage-disposal for the parish. The surveyor, Mr. Godfrey, explained the scheme.

In the House of Lords, the Portsmouth, Basingstoke, and Godalming Railway Bill, which has been under consideration for some days, and to which strong opposition was offered by the London and South-Western Railway Company, has been rejected.

Holyrood Free Church, Edinburgh, was reopened for public worship on Sunday, after having been entirely resited and redecorated. The decorative work has been carried out by Mr. D. J. Tough, St. Andrew-street, Edinburgh.

The new Roman Catholic church near the Gillingham crossing, New Brompton, Kent, which has been erected at a cost of about £1,300, was opened on Tuesday week. The building, which will accommodate over 200 persons, consists of a sanctuary, sacristy, and about two-thirds of the nave.

With the exception of the National Portrait Gallery, the whole of the great national museums in London were opened on Sunday, and the attendance at them numbered 9864. Next Sunday the National Portrait Gallery will also be thrown open.

The new post-office at Leeds, which has frontages to City-square and Quebec-street, was opened on Friday. It has been built from designs by Mr. Henry Tanner, of H.M. Board of Works, and was illustrated in our issue of March 4, 1892.

One of the oldest tradesmen in Newbury—Mr. Joseph Harrison, builder, of Bartholomew-street—died at his residence on Tuesday morning. The deceased succeeded to his father's business many years since, but he never took a prominent part in public affairs. He had reached the advanced age of 83 years.

At a sale of pictures in London on Saturday, Turner's "Boats carrying out Anchors and Cables to Dutch Men-of-War, 1665," exhibited at the Royal Academy in 1804, realised 1,550 guineas. Sir John Millais' "The Good Knight" fetched 860 guineas.

On Saturday the foundation-stones were laid of a new chapel about to be erected at Lea Brooks, Somerset, in connection with the United Methodist Free Church body. The old chapel had become dilapidated, and it was decided to pull it down and build a larger one on the same site, at a cost of £650.

The new municipal buildings at King's Lynn were opened on Thursday in last week, when the town council assembled in their new chamber and held the quarterly meeting. The premises are in Queen-street, adjoining the town hall, and they have been built by Messrs. Young and Sons, of Norwich, at a cost of £3,272 10s. 4d., from designs prepared by Messrs. Philip H. Tree and Ivor Price, of London and St. Leonard's.



## COMPETITIONS.

**BEDFORD.**—In the limited competition among seven invited architects, for rebuilding the Bedford General Hospital, the assessor, Professor T. Roger Smith, recommended for the first premium a design which, on opening the envelopes, proved to be that submitted by Messrs. Stephen Salter and Adams, and for the second that submitted by Messrs. Houston and Houston. The committee of the hospital have adopted the report, and it may be worth note that they have paid the premiums without making the stipulation sometimes introduced, that if the successful competitor be employed to build the hospital, the premium shall merge in his commission. The designs, all of them by architects who have had experience in hospital work, are very good—as was to have been expected.

**LIVERPOOL.**—Mr. Aston Webb, F.S.A., V.P.R.I.B.A., the assessor, has at present under his consideration, at Queen Anne's Gate, five of the large number of plans which have been submitted in response to the invitation of the Corporation of Liverpool to architects to compete for premiums to be awarded in the case of designs for the extension of the museum in William Brown-street to the corner of Byron-street.

**LOWESTOFT.**—The town council have considered the report of the technical instruction committee, which dealt with the plans of the competition for the Technical and Art Schools. The committee selected two plans, one bearing the motto "Finem Respice," the cost of which was estimated at £7,000, and the other "Borough and County," estimated cost to the borough, £5,130. The committee originally recommended "Finem Respice," but the matter was sent back to them on the question of cost, and they now again recommended that plan; but in the event of council thinking the cost too much, submitted "Borough and County" as the next best. "Finem Respice" would cost 1d. in the £ for 40 years, and "Borough and County" 3d. The cost was thought by the town council to come too near the limit of outlay, and that there would be no margin for management, and by 16 to 8, "Borough and County" was adopted. On opening the sealed envelopes the author of this design proved to be Mr. George William Leighton, of 6, Princes-street, Ipswich.

## CHIPS.

The Duchess of Fife, who was accompanied by the Duke, opened on Friday the new church home in connection with All Souls', Langham-place, which has been erected in Great Titchfield-street at a cost of £8,000.

The formal opening of a new board school in the Woodside district of Glasgow took place on Friday. While practically a new school, the building is nominally an extension to Woodside School. The new buildings is in the Italian style, three stories in height, and covers an area of 10,000sq.ft., the cost of construction having been about £15,000. The ground floor is for infants, there being accommodation for 492, and the other floors will be devoted to secondary and higher class education.

Major Cardew and Col. Yorke visited the Hartlepool on Friday, and inspected the new electric tramways on behalf of the Board of Trade. The trams having been passed, commenced running on Monday.

The Isle of Thanet Rural District Council, at their meeting on Thursday in last week, appointed Mr. Bailey Denton as consulting and executive engineer for the drainage of Westgate.

The swing bridge, which has just been completed over Douglas Harbour, Isle of Man, at a cost of £17,000, was formally opened on Saturday by the Mayor of Douglas. The bridge is an iron structure for carriage and foot traffic, and was manufactured by Messrs. Armstrong, at Elswick Ironworks.

The highway bridge at Leigh, Headcorn, is about to be rebuilt, at a cost of £500, from plans by Messrs. Ruck, Son, and Smith, of Maidstone.

The Earl and Countess of Dartmouth visited Slaitwhaite, near Huddersfield, on Saturday, to unveil a memorial in the parish church to the late Earl of Dartmouth, who died in August, 1891. The memorial takes the form of a triptych, having mahogany panels, on which are painted a representation of the Adoration of the Magi; it is the work of Mr. A. O. Hemming, of Margaret-street, W. A new Communion-table, executed by Messrs. J. Varley and Sons, of Slaitwhaite, forms a further portion of the memorial.

The new railway constructed across the Wirral peninsula to Connah's Quay was opened for passenger traffic on Monday.

## TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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## ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L., LI., LII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—G. H. F.—S. W. Baxter.—R. N. and Co.—Turk.—B. W. P.—W. M. (Truro).

## Correspondence.

## LIGHTNING CONDUCTORS.

To the Editor of the BUILDING NEWS.

SIR,—A correspondence on this subject appeared in the columns of the *Yorkshire Post* about a month ago, which conclusively points to the fact that, although our large modern buildings are deemed incomplete without the addition of a so-called "lightning conductor," the majority of the general public (including even those who erect them) have but vague and even erroneous notions as regards their action and utility.

A very general idea, for instance, seems to prevail that the office of the "conductor" is to convey in safety to the ground any stray flash of lightning which may come within reach of its attractive power, and thus protect the building from which it is carefully disconnected by glass or earthenware insulators—from the destructive effects of the electric fluid.

Now, as one who for years has carefully studied the action of lightning conductors from both a practical and scientific point of view, I trust I may be pardoned for disproving this fallacy by explaining what actually occurs when a thunderstorm threatens, and what it really is that the lightning conductor is expected to do. In the first place, then, the earth becomes charged, by induction, with an opposite kind of electricity to that contained by the black overhanging cloud, and the equilibrium of the consequently disturbed state of the atmosphere is restored by flashes of "forked" lightning. This dangerous state of things is, however, obviated by the opposing electricities becoming quietly re-united through the medium of the "conductor," which invariably passes the electric fluid to the cloud and not vice versa. I may add that the terminal of the rod

would be a knob or ball (instead of spikes) if the lightning flash were intended to enter at its upper extremity, and, furthermore, I feel convinced that were it ever to do so our so-called "lightning conductor" would be fused and the building to which it was attached wrecked, whether the rod were insulated or no!

In the name of commonsense, then, let us in future give the instrument its proper designation of a "lightning protector," and instead of insulating it increase its efficacy by closely attaching it to all eave-gutters, waterpipes, and lead flashings, &c. The spiked terminal is quite correct; but the earth attachment should be as extended as possible, the object being to drain off the "induced" electricity not only from the building itself, but also from its surroundings. A flat copper band or ribbon (as giving more superficial area) is preferable to a solid rod, since electricity invariably travels along the surface of a conductor and not through its solid structure.—I am, &c., RICHARD I. J. IRWIN, Architect.  
20, Robert-street, Harrogate, May 16.

## Intercommunication.

## REPLIES.

[11502].—Noiseless Paving for Stables.—We think your correspondent "A. B." will find compressed asphalt slabs the most suitable paving to deaden noises in the stable. These wear well, and do not absorb moisture, which is one objection to cork paving.—SPEEDWELL CHEMICAL CO.

## CHIPS.

The Nantyffyllon Schools, Maesteg, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates, the same being supplied by Messrs. Shorland and Brother, of Manchester.

A new high school for girls is about to be built at the top of Lemon-street, Truro, from plans prepared by Mr. E. R. Robson, F.S.A., architect to the Education Department.

The town council of Aberdeen have resolved upon the appointment of a permanent fire brigade for the city. They decided to advertise for a firemaster at a salary of £150 per annum, and also to invite plans for the new fire station to be erected in King-street.

The Provisional Order of the Local Government Board respecting the Plymouth Amalgamation Scheme was received on Friday. The Local Government Board assent to the inclusion of the whole locality sought to be acquired, excepting Stonehouse. The scheme will include the Parliamentary borough of Compton, Penny-cross, from a line running from St. Joseph's Home to Pound's, until it meets the Parliamentary borough; the whole of Plymouth Cemetery, and the greater part of Milbay and Laira.

On Saturday the final sitting of an arbitration in connection with the sale of land at Harrogate to the North-Eastern Railway Company, for their new goods station, was held at Westminster, before Mr. Thomas Gow, as umpire. The claimants' witnesses valued the property at about £25,000 and the railway company's valuers put it at between £7,000 and £8,000. After hearing the speeches of counsel, the umpire reserved his award.

At Harrogate four memorial stones were laid on Monday of a new Wesleyan chapel, to be erected in Grove-road. The chapel is to be built of Killinghall and Pateley Bridge stone, and will have a frontage of 82ft. by 50ft. to Grove-road. It will accommodate 700 people. There will be a gallery, band-room, and the usual vestries. Together with the school, the whole scheme is estimated to cost £6,500. The principal contractors are Messrs. J. Simpson and Sons, masons; and Mr. T. Linskill, joiner. Mr. Morley, of Bradford, is the architect.

The St. Helen's Corporation have applied to the Local Government Board for sanction to borrow £6,500 for providing additional hospital accommodation for cases of infectious disease, and Mr. Theodore Thomson, an inspector of the board, held an inquiry on Tuesday into the matter at St. Helen's Town Hall.

The attempts which have been made to secure the late Lord Leighton's house for the nation having failed, the residence was offered for sale by auction on Tuesday. The biddings stopped at £11,900, and consequently the property was bought in.

A colossal statue of John Knox, executed in bronze by Mr. John Hutchinson, R.S.A., of Edinburgh, and erected in the quadrangle of the Free Church College, Edinburgh, was unveiled after the meeting of the General Assembly yesterday (Thursday) afternoon.



## Legal.

### WAREHOUSES AND WALLS.

THE London Building Act, 1896, contains a good many sweeping clauses, and several that will need careful construing by the Courts before their meaning is finally settled. One of these points came up in the recent case of the Army and Navy Stores (*Times*, May 14), in which a summons had been taken out under section 75 of the Act, which provides that no building of the warehouse class shall extend to more than 250,000c.ft. unless divided by party-walls in such a manner that no division shall extend to more than this figure. The defendants had erected a building of the warehouse class of the capacity of 657,408c.ft. One portion went up to five stories, the other to only one story. This lower part was lighted by a skylight. There was a wall between these two portions which was admittedly a party-wall, as regards its dividing part. But the defendants contended that the rest of the wall which went up to carry the other four stories of the higher building was not a party-wall, and so that they were at liberty to construct windows and openings therein; without regard to the provision as to party-walls. The magistrate had refused to convict, and had stated a case for the High Court.

It was argued for the district surveyor that the whole wall was a party-wall, and also that the defendant's contention involved the anomaly of an external wall being built upon a party-wall, which it was argued was impossible and absurd, as an external wall could only be erected upon a bressumer, or have proper footings. The Court, however, supported the decision of the magistrate in refusing to convict. They held that the words "party-wall" were not used in that section in a technical sense. All the clause meant was that so far as a wall was a party-wall, it should comply with the requirements in that respect. But that there was no presumption of a wall which was a party-wall as to a portion of its height should be a party-wall as to the whole of its height. Section 75 did not define a wall above the line where it ceased to divide the two buildings. The practical point taken by the district surveyor seems to have been that the windows and openings in the wall of the main building increased the risk of fire, which it had been the object of this section to reduce.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

A new bridge across the river Derwent at Blackhill Mill, between Ebechester and Lint-green, was formally opened on the 13th inst. The bridge, which has been built at a cost of £2,100, jointly borne by the Durham County Council, and the rural sanitary authority of Lanchester, was designed by Mr. W. T. Fowls, of Wolsingham, and was built by William Hilton, of Witton-le-Wear. It is a plate-girder bridge, 20ft. wide in the carriageway, and consists of two 40ft. spans.

On Wednesday week, at the Mechanics' Institute, Whaley Bridge, Mr. G. W. Wilcocks, M.I.C.E., held an inquiry into the application of the urban district council to borrow £1,000 for the purchase of the institute, which would be adapted for public offices and technical education classes. There was no opposition.

A public meeting was held in the Hartley Hall, Southampton, on Thursday afternoon in last week, to take into consideration the question of raising the necessary funds for carrying out an amended scheme and plans for the proposed alterations and additions to the Royal South Hants Infirmary, as presented to the governors of the institution by Messrs. Young and Hall, architects, of London. The absolute necessity for the sanitary improvements was explained, and it was stated that the estimated cost of the entire scheme was £19,000.

Judgment was given in the Court of Appeal, on Saturday, in the matter of the rating of Brockwell Park, the London County Council contending that neither the park nor the erections upon it were liable to assessment to the poor rates. Mr. Baron Pollock and Mr. Justice Wright, sitting as a Divisional Court of the Queen's Bench, had decided that the park and premises were assessable as a whole to the amount of the beneficial value; but this judgment has been reversed by Lords Justices Smith and Rigby, who held that the property was not rateable.

## LEGAL INTELLIGENCE.

IN RE KENT PINCHBECK.—This was a sitting for the adjourned public examination of a bankrupt architect and surveyor, of York-buildings, Adelphi, formerly of Cardiff, then of Southampton, who is at present undergoing a term of imprisonment for obtaining goods and contracts under false pretences. He states that he started as a quantity surveyor ten years ago in London, and in 1891 removed to Cardiff, where he engaged in building in the King's-road and Cowbridge-road, Cardiff. He remained at Cardiff up to last year, then going to Southampton and Woking. The houses in Cardiff he mortgaged for £3,100, and those in Llandaff for £1,200. He returns his gross liabilities at £7,170 17s. 4d., of which £802 is unsecured, and the assets at £1,098 19s. 4d., thus showing a surplus subject to realisation. He attributes his failure to liability as guarantor for debts contracted in a building speculation, and interest on mortgages of the leasehold houses of Cardiff and Llandaff, which have been unlet for a great portion of the past few years. The sitting was adjourned to June 12.

THE THIRLMERE AQUEDUCT: CONTRACTOR'S CLAIM AGAINST THE MANCHESTER CORPORATION.—At the Surveyors' Institution, Great George-street, Westminster, on Saturday, an arbitration was opened before Mr. Harrison Hayter, of Westminster, as umpire, in which Mr. W. Webster, the contractor for the lower portion of Thirlmere Aqueduct (that situated nearest Manchester), sought to obtain from the Manchester Corporation about £50,000 in respect of extras. Sir F. Bramwell, representing the contractor, and Mr. G. H. Hill, for the corporation, sat with the umpire as arbitrators.

## CHIPS.

The council of the Sanitary Institute have accepted an invitation from the city and county of Newcastle-upon-Tyne to hold a sanitary congress and health exhibition in that city in the autumn of this year.

Sir Arthur Arnold, on Saturday, opened the newly-acquired Hilly Fields, Brockley, and dedicated them to the use of the public for ever. The fields contain an area of upwards of forty-five acres, and cost £44,872, of which the County Council contributed £23,572. A number of trees have been planted, provision has been made for cricket, and a band-stand has been erected.

Colonel Farquharson, C.B., though retiring from the army, will retain his appointment as Director-General of the Ordnance Survey, at Southampton, an office in which he succeeded Sir Charles Wilson a few years ago.

By the collapse of the gates leading from St. Andrew's Fish Dock at Hull into a new dock just excavated adjoining the older structure, damage to the extent of £30,000 was caused to the fabric and smacks in the old dock. The collapse of the gates was due to hidden springs being freed by the pile-driving and excavation.

The aggregate of sales at the Tokenhouse Mart last week, as officially reported from the Estate Exchange, was £99,764—a satisfactory total even for this busy period of the year.

At the Building Trades Exhibition, held in St. James's Hall, Manchester, Messrs. Messenger and Co., horticultural builders, Loughborough and London, were last week awarded a silver medal for their glasshouse exhibit.

Plans of the premises which the Liverpool Electric Supply Company proposes to erect in Paradise-street, in that city, were the subject of a somewhat prolonged discussion by the finance and estate committee of the Liverpool Corporation on Friday, and a recommendation to the city council to sanction these was adopted by six to four votes. A chimney 140ft. in height forms part of the project.

On Saturday the new premises of the Wiltshire School of Cookery and Domestic Economy, situate in Fore-street, Trowbridge, were opened by Lady Lucy Hicks-Beach.

The well-known painter, Luminis, died at Paris last week, at the age of seventy-five. Luminis studied under Leon Coignet, and exhibited in the Salon for the first time in 1843. He obtained the Cross of the Legion of Honour in 1869, and was rewarded with a gold medal at the 1889 Exhibition.

A large block of business premises, with suites of offices above the shops, is about to be built in Silver-street, Bury, Lancs, from plans by Mr. J. D. Mould, of Bury and Manchester. The contract for the excavations and basements had been taken by Mr. Charles Brierley, of Bury.

Plans have been prepared and approved by Sir Arthur Blomfield and the Incorporated Church Building Society for the restoration of the ancient parish church at Bow, E. The work at present contemplated will cost £1,750. Contributions towards this sum, amounting to nearly £1,000, have been received.

## WATER SUPPLY AND SANITARY MATTERS.

THE WELSH WATER SCHEME FOR LONDON.—At Tuesday's meeting of the London County Council the water committee reported that up to March 31 £2,356 had been expended on plans of the Welsh water scheme out of the Council's grant of £3,400. The balance of this having lapsed, the Council must grant further money unless the inquiries were to cease altogether. The plans of the scheme considered by the Council on April 21 were in a very forward state, and by means of additional temporary assistance could be completed by the end of July at a total expenditure of £2,500. The committee had unanimously arrived at the conclusion that it was advisable that the investigations should be continued so as to complete the engineering plans and sections without delay. This course would have two important results. It would enable the engineer to submit more detailed and precise estimates of the cost of the Welsh scheme than hitherto, and it would render it possible for the Council, or for any other water authority, if it so desired, to prepare Bills for Parliament for deposit in December next. The committee urged that whether the Metropolitan counties water board foreshadowed by a Bill now before Parliament were created or not, the Council would be doing right in making such preparations as would enable whatever water authority there was, if it so resolved, to take immediate action for bringing additional supplies of water from Wales upon the lines of their report, and they asked the Council to empower them to expend a further sum of £2,500, with the view of placing the Council, or any Metropolitan water authority succeeding to its powers, in a position to initiate legislation on this subject in the session of 1897. The report was adopted, with the addition of a clause stipulating that no portion of the expenditure be incurred in preparing plans with reference to owners, lessees, and occupiers.

SEWERAGE OF WESTGATE-ON-SEA.—The rural district council of the Isle of Thanet, Kent, at the desire of the parish council of Westgate-on-Sea, have instructed Mr. E. Bailey-Denton, M.Inst.C.E. (Messrs. Bailey-Denton, Son, and North, of Palace Chambers, Westminster), to immediately prepare plans for sewerage. It has now been decided to pump the sewage into the main outfall sewer of the borough of Margate, discharging into the sea at the North Foreland, should the terms imposed by that borough prove acceptable to Westgate. Failing this, the sewage will be raised to, and utilised upon, the marsh lands beyond Birchington. The works will not be commenced until October, but will be finished by April, 1897.

The corporation of Dover have received official sanction to their scheme of electric tramways throughout the borough. The work will be proceeded with immediately, at an estimated cost of £50,000.

At a meeting of the Glasgow and West of Scotland Ecclesiological Society, held on Monday in Woodside Church, the Right Rev. John Dowden, D.D., Bishop of Edinburgh, read a paper on "The Mediaeval Scottish Cathedrals." Bishop Harrison, Glasgow, presided. The Bishop of Edinburgh, in his address, gave what he himself described as a "dry-as-dust account of the constitution of the ancient Scottish cathedrals."

The town council of Ayr adopted, on Monday, a proposal to build a new bridge to connect the east district of Wallacetown with the Townhead, Ayr, and also to accommodate the Dam Park on the north side, which the Ayrshire Agricultural Association intend to purchase as a site for the April show at Ayr. The bridge will cost from £4,000 to £6,000, and is intended to be built a few yards above the present railway bridge.

At the Edinburgh University, on the 14th inst., Mr. S. Henbest Capper, M.A., delivered the first of a course of lectures on architectural history with special reference to the examinations of the Royal Institute of British Architects. Professor Baldwin Brown, in introducing the lecturer, spoke of the value of the course of study organised by the Institute. Mr. Capper in his lecture dealt with the development of architecture in Europe between the Roman and the Mediaeval periods.

On Thursday in last week, Col. R. G. Durnford, R.E., Local Government Board inspector, held an inquiry at West Bromwich into the application of the town council for the sanction of loans in respect of public works and pleasure grounds, amounting to £7,966. Mr. Eayrs, the borough surveyor, said £3,000 was needed for the construction of the Kenrick Park, £473 for fencing the land adjoining Oak House, £423 as excess in expenditure on previous loans for Dartmouth Park, £1,150 for the purchase of land and for work for Hill Top Park, £1,350 for Meyrick House to be converted into a branch police station, fire-station, and free library; £652 for improvements in Brickhouse-lane, £485 for extensions at the baths, and £433 for alterations at the town hall.



## Our Office Table.

THE following acquisitions have been made to the National Portrait Gallery since its recent opening in the new premises; but, owing to the difficulty of finding wall-space, it may be some time, Mr. Lionel Cust, the director, reports, before these new portraits can be exhibited to the public. By gift there have been added five works:—Thomas Graham, Lord Lynedoch, an oil-painting by Sir George Hayter, R.A., presented by the Earl of Bradford; Baron Carlo Marochetti, R.A., a bronze statuette by Signor Ambrosio, of Turin, presented by Signora Muratori; Dr. Dionysius Lardner, a miniature painting by Miss Fortunée De Lisle, presented by his son, Commissary-General George D. Lardner; David Livingstone, an oil-painting by Frederick Havill, presented by John Lillie; and Georgiana, Duchess of Devonshire, painted as a child, by Sir Joshua Reynolds, presented by Lord Ronald Gower. There are three bequests:—Rev. Frederick Denison Maurice, an oil-painting by Samuel Laurence, bequeathed by Mrs. F. D. Maurice; and Rev. John Keble and Samuel Rogers; two fine drawings by George Richmond, R.A., bequeathed by the artist. The recent purchases are four in number:—Colley Cibber, a plaster bust, painted like life, and probably modelled by L. F. Roubiliac—this bust was formerly in the Strawberry Hill collection, it having been presented to Horace Walpole by Mr. Rafter, brother of Mrs. Clive, the actress, to whom it had been given by Cibber himself; Felicia Dorothea Hemans, a plaster bust modelled by Angus Fletcher; George Gordon, Lord Byron, an oil-painting by Richard Westall, R.A., exhibited at the Royal Academy in 1825, and at the National Portrait Exhibition in 1868; and Archbishop Tobie Matthew, an old panel portrait, dated 1619, artist unknown.

MR. ALDAM HEATON'S remarks on fabrics illustrate the public taste for showy articles. To-day cheap imitations are in demand even by those whose purse is not limited. Mr. Heaton referred to the imitative fabrics known as velvet and silk damask. He instanced velveteen as a ground-work for printed curtains, very showy in texture, but a fabric which quickly fades, and a good dust harbourer. "Plushette" is another commercial production of a similar class. Again, he tells us the silk damask "made for to-day's trade is nearly all cotton," the lucifer match will detect the cotton at once. On the other hand, the "silk damask which covered the walls of an Italian palace was entirely net or thrown silk." To what an extent has the British public fallen in their love for cheapness! If anyone desires to test for himself the worthlessness of fabrics made with cotton in the warp and in the weft, let him cover his chairs with a "silk damask" of the kind described, and see the result of a few months' wear.

THE report for 1895 of the Conservators of the River Thames states that in the case of farms, manufacturing premises, and private residences, from which pollution formerly passed into the streams of the Thames basin, the notices served resulted in a complete diversion of the sewage in 534 instances. The powers of the Conservators with respect to pollution from houseboats and other vessels were also carried into effect, with the result that the passage of sewage from those vessels was effectually stopped. The Conservators found that they have no power to expend their funds on works for the prevention of floods, but they will continue to carry out the works for navigation purposes in such a manner as to afford the best means of escape for the water in times of flood. The report states that when the works above Oxford are completed there will be a navigable channel of not less than 5 ft. in that part of the river, and communication with the Thames and Severn Canal can be reopened.

IN another column will be found the announcement of the Carpenters' Company's Annual Examinations in Carpentry and Joinery. The series of lectures which is delivered primarily to intending candidates is now over, and the attendance has been very good. Professor Banister Fletcher and T. Roger Smith were among the lecturers. The Company has been fortunate in also securing these gentlemen to act as two of the examiners. The Carpenters' Company have invited further the Presidents of the R.I.B.A., of the Institution of Civil Engineers, of the Architectural Association, &c., to join the examining

board. We learn with satisfaction that the entries for the examination already outnumber those of almost all previous years, and that candidates are by no means confined to London and the neighbourhood. The steady advance in the favour shown by builders and many public bodies to holders of the Carpenters' Company's certificates shows how thoroughly practical is the test applied by the examiners.

THE Tredegar Estate authorities have at present in hand an important house-building scheme, by which the town of Cardiff will be very much extended on the north-eastern side. The ground to be laid out and built upon is the portion of the estate lying between St. Margaret's Church, Roath, and the eastern end of the Roath Park, is bounded on the north side by Roath brook, and on the south by Albany-road, and is about half a mile long by about a quarter of a mile broad, the measurement showing about 50 acres. About 600 houses of various classes will be erected, and Albany-road from the church westward and Delta-place running from that road to Wellfield-road, will be widened and improved. Sites have been taken by the managers of one Presbyterian church and two Baptist churches. The plans for laying out the roads and putting in sewers and drains are in an advanced state of preparation, and after these have been passed by the corporation operations will be commenced, probably some time during this summer.

OUR Chicago brethren are not only anxious to excel in the height, but in the rapidity of the erection, of their tall steel buildings. From the reports in building papers, it appears that the record for rapid erection has been broken by the Fisher Buildings, Chicago, which is 13½ stories in height, and has taken only fourteen days. This structure is 18 stories, or 235 ft. high, and covers an area of 70 ft. by 100 ft. Chicago is said to have more buildings of the steel skeleton type than all American cities together. But then this is not building in the old sense of the term; it is not much more than scaffold erection. The steel columns and girders and framework have to be made beforehand, and the erection is simply a matter of putting together. One day we shall hear of these frames of steel being hinged together and raised *en masse*, and then secured by ties; the next stage in the evolution of the steel structure is portability.

### MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—Royal Institution. "The Building and Sculpture of Western Europe," No. 1, by Professor T. G. Bonney, F.R.S.

THURSDAY.—Royal Institution. "Lake Dwellings," No. 1, by Dr. Robert Munro, Sec. R.S.A.Scot.

FRIDAY.—Architectural Association. Annual dinner at Holborn Restaurant. 7 p.m.

SATURDAY (TO-MORROW).—Edinburgh Architectural Association. Visit to St. Serf's Church, Dysart, and to Ravenscraig Castle. Trains from Waverley Station 2.10 p.m.

The death of Mr. David Logan, M.I.C.E., chief engineer South Indian Railway, occurred at Trichinopoly on April 17. Mr. Logan went out to India in 1850, and his connection with the South Indian Railway commenced ten years later, when that line was known as the Great Southern of India Railway. He was the *doyen* of chief engineers of Indian Railways, and died in harness at the age of 65 years.

The memorial stone of an extension of the Primitive Methodist College in Alexandra-road, Manchester, was laid on Tuesday week by Mr. W. P. Hartley, of Aintree. The present college gives accommodation to some thirty students for the ministry. By the generosity of Mr. Hartley, room is to be made for double that number, at an estimated cost of £10,000.

At a general assembly of the the Royal Society of British Artists the following gentlemen have been elected members—viz., Messrs. T. W. Cafe, Isaac Cooke, A. H. Collings, O. Eckhardt, John Eyre, Reginald Frampton, G. P. Gaskell, W. Lee Hankey, Charles Low, J. W. T. Manuel, and S. H. Sime.

On Saturday the formal opening of a new recreation ground at the north end of Darlington took place. The corporation purchased 16 acres of land contiguous to the North Cemetery, which has been laid out at a cost of about £2,000, the land bringing the whole to about £5,000.

Consequent on the resignation of Professor Perry, owing to his obtaining an appointment in connection with the Royal College of Mines, the post of Professor of Mechanical Engineering at the Technical College, Finsbury, has been rendered vacant. The salary offered is £600.

## Trade News.

### WAGES MOVEMENTS.

THE LONDON BUILDING TRADE DISPUTE.—In accordance with notice, the whole of the carpenters and joiners in the Metropolis belonging to the Amalgamated Society and the General Union came out on strike on Monday morning, and this week all the council of the former Society have come to London from Manchester to assist the London executive and the councils of the other towns concerned. There is every probability that the men will win a speedy victory, for each day reports come to hand of fresh firms who have yielded the points in dispute, and already nearly 5,000 men of the 12,000 affected have resumed work at the improved wage. The men's demand has, indeed, been conceded by 110 firms, four of them being members of the Central Association of Master Builders. Mr. Henshaw, the secretary of the Central Association of London Master Builders, states in an official communication that "negotiations are still pending with the carpenters and joiners and painters for a settlement of the questions in dispute. The plasterers and labourers have rejected the committee's proposals. The negotiations with the carpenters and joiners are proceeding in a most satisfactory manner, and it is hoped a settlement will be arrived at by the end of the week. The trades with whom the committee have now settled a code of rules are, bricklayers, plumbers, and smiths and fitters, the increase in wages in the two latter societies commencing from August 1, next."

BROMLEY, KENT.—The master builders have conceded an advance of ½d. an hour to bricklayers; but at present have declined to grant a like increase to the bricklayers' labourers, who threaten to come out on strike.

DOVER.—The employers have granted the house-painters and decorators an increase from 6d. to 6½d. per hour.

DUNFERMLINE.—The Dunfermline operative masons, who came out on strike on Saturday, resumed work on Tuesday. A conference of employers and representatives of the workmen took place on Monday night, when an agreement was arrived at by which a system of weekly payments is to come into operation on 20th June.

EDINBURGH AND LEITH.—At a joint meeting of the operative masons of Edinburgh and Leith, held on Friday night in the Free Tron Hall, Chambers-street, Edinburgh, Mr. Andrew Craig presiding, after discussion, it was resolved to approach the employers with a view of securing a working agreement at 9d. per hour for a year as from July 6 next.

GLASGOW.—As the result of a conference on Tuesday between the Glasgow master plumbers and the men on strike, a settlement has been effected, and work was resumed yesterday (Thursday).

LIVERPOOL.—The cabinet-makers, who have been on strike for a fortnight, have obtained an advance of ½d. per hour and a reduction of hours to eight per day.

### CHIPS.

An organ, built by Mr. Binns, of Bramley, has just been completed in St. Aidan's Church, Roundhay-road, Leeds.

A large hotel is about to be built on a portion of the old White Cloth Hall Estate, in the centre of Leeds. The architects are Messrs. Chorley and Connon, of Park-row, in that city.

The water committee of the Colne Corporation have recommended the construction of a new compensation reservoir in the Wycollar Valley, distant about four miles from Colne. This step has been rendered absolutely necessary in consequence of the rapidly-increasing population, and the inadequacy of the present springs to yield a larger supply. Mr. Hill, C.E., of Manchester, has been secured as the corporation's engineer. The undertaking will entail an outlay of £50,000.

The governors of the Belfast City and District Asylum have passed a resolution requesting the commissioners of control to advertise for competitive plans for the erection at Purdysburn of two chronic blocks for the reception of 300 patients, and such portions of the administrative buildings as are necessary for an asylum capable of containing hereafter 800 patients, with facilities for future extension to 1,000 patients.

The convalescent home at West Kirby, near Liverpool, has been enlarged by the addition of a new wing, which has just been opened. The new wing is of red bricks, to match the main block, its chief internal features being the provision of isolation rooms for infectious diseases, and a special ward for crippled children. There is also a disinfecting chamber and a large, well-lighted day-room. The building, which has cost £3,000, will provide an additional thirty beds.



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#### TENDERS.

\*. \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

<b>ALDERSHOT.</b> —For building a hospital:—			
Knight, F.	...	...	£2,830 0 0
Lee, E. T.	...	...	2,664 0 0
Seaber, E.	...	...	2,568 0 0
Martin, Wells, and Co.	...	...	2,390 0 0
Garland	...	...	2,197 0 0
Kemp, G. (accepted)	...	...	2,125 0 0

**AMERSHAM.**—For laying pipes, &c., for the Amersham, Beaconsfield, and District Waterworks. Mr. E. A. Sandford Fawcett, A.M.I.C.E., 1, Victoria-street, Westminster, engineer:—

Free and Sons	...	...	£1,900 0 0
Williams Bros.	...	...	1,800 0 0
Baldwin and Son	...	...	1,708 0 0
Ward and Cannon	...	...	1,643 0 0
Lee and Sons	...	...	1,600 0 0
Darlington, G. (accepted)	...	...	1,595 0 0

**ASHBY.**—For the erection of the new infant board schools:—

Beacock, J., Scunthorpe	...	...	£520 0 0
Robinson, Scunthorpe	...	...	515 17 6
Thompson, H., Scunthorpe	...	...	510 0 0
Varah, H., Ashby	...	...	470 0 0
Kinsley, Jos., Ashby (accepted)	...	...	393 0 0

**BIRMINGHAM.**—For building a new organ in the work-house chapel, for the city board of guardians:—

Halmshaw and Son (accepted)	...	...	£185 0 0
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**BOURNEMOUTH.**—For repairs to the police station, for the Hants County Council:—

Chinchen, W. J., Bournemouth	...	...	£700 0 0
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(Accepted.)

**BRISTOL.**—For the construction of pontoons for passenger steamers below the present pontoons at Cumberland Basin, for the docks committee:—

Barnes, Chaplin, and Co., Cardiff (accepted).	...	...	
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**CASTOR.**—For providing a lightning conductor to the spire of the parish church of Castor, near Peterborough:—

Campbell, Milton-street, Peterborough (accepted).	...	...	
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**CHICHESTER.**—For the erection of a new residence at Mead-road, Chichester, Kent. Ernest A. Mann, M.S.A., London, architect:—

	House.	Fences.	Total.
Rider, T., and Son	£1,259	£50 0	£1,309 0
Wood, F.	1,080	43 0	1,123 0
Crosley, T., and Son	1,059	42 0	1,101 0
Otway, J.	1,020	37 0	1,057 0
Knight, T.	—	—	1,029 0
Lowe, R. A.	995	30 0	1,025 0
White, B. L., and Son	973	39 6	1,012 6
Somerford, H., and Son	889	29 0	918 0

**CHALFONT ST. PETER'S.**—For the erection of epileptic home for women at Skipping's Farm, for the National Society for the Employment of Epileptics. Mr. Ernest C. Shearman, A.R.I.B.A., Cheveley-road, Newmarket, architect:—

Darlington, G., Amersham (accepted).

**CHELSEA.**—For rebuilding the girls' and infants' offices, also providing additional offices for boys, and part new drainage scheme at St. Clement's-road Old School, for the London School Board:—

McCormick and Sons	...	...	£1,567 0 0
Mallett, H.	...	...	1,530 0 0
Cruwys, T.	...	...	1,525 0 0
Downs, W.	...	...	1,420 0 0
Lathey Bros.	...	...	1,387 0 0
Vernall, Danes, and Co.	...	...	1,380 0 0
Holliday and Greenwood	...	...	1,363 0 0
Triggs, E.	...	...	1,344 0 0
Yerbury, R. A., and Sons	...	...	1,263 0 0
Beattie, R. P.	...	...	1,231 0 0

\* Recommended for acceptance.

**CUDINGTON.**—For isolation hospital, Cuddington, Surrey. Mr. H. D. Searles Wood, F.R.I.B.A., 157, Wool Exchange, E.C., architect:—

Wells, Hainstead	...	...	£11,223 0 0
Burnand, E. J., Wallington	...	...	10,800 0 0
Potter, J. B., Sutton	...	...	10,685 0 0
Hards, S., Ewell	...	...	10,584 7 0
Grist and Co., Ltd., Aylesbury	...	...	10,478 0 0
Humphries, R. L., Sutton	...	...	10,295 0 0
Peters and Son, Horsham	...	...	10,200 0 0
Balchin and Shopland, Sutton	...	...	9,870 0 0

\* Accepted.

**DEEPING ST. JAMES.**—For the erection of a Primitive Methodist chapel:—

Hinson Bros., Stamford (accepted)	...	...	£500 0 0
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(Lowest of four tenders received.)

**DEVIZES.**—For constructing new sewer, manholes, &c., St. Joseph-place, Devizes, for the Devizes Urban District Council. Mr. G. Billingham, borough surveyor:—

Palmer, G., Neath	...	...	£395 11 7
Brown, G., Devizes	...	...	324 14 0
Jackman and Son, Slough	...	...	321 0 0
Ash, H., Devizes (accepted)	...	...	290 0 0

**DOVER.**—For the erection of three shops with dwellings over in Priory-place, for Mr. H. W. Thorpe, Messrs. Worsfold and Hayward, Dover, and 80, Cannon-street, London, E.C., architects. Quantities by Messrs. Dunk and Bousfield, Billiter Square-buildings, E.C.:—

Adcock, W. J.	...	...	£1,635 0 0
Stiff, H.	...	...	1,595 0 0
Austen and Lewis	...	...	1,580 7 0
Lewis, G., and Sons	...	...	1,580 0 0
Bromley, W.	...	...	1,559 0 0
Hayward and Paramor	...	...	1,490 0 0
Denne, W. & T., Walmer (accepted)	...	...	1,450 0 0

Rest of Dover.

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Chatsworth and Devonshire House, for His Grace the Duke of Devonshire.

Wynyard Park and Londonderry House, for the Right Hon. the Marquis of Londonderry.

Lansdowne House, for the Right. Hon. the Marquis of Lansdowne.

The Bank of England and Branches. North British and Mercantile Insurance Co.

New Scotland Yard; and Prudential Assurance Co., Holborn Bars.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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FRIDAY, MAY 29, 1896.

### MORE QUESTIONS CONCERNING CONTRACTS.

FIVE weeks ago—that is, on April 24—we mentioned three important questions which had been asked at the Surveyors' Institution, and made some remarks about the first of them: "Ought the quantities to form part of the contract?" To this our reply was: "Yes, if they are prepared by the architect of the building. No, if they are prepared by an outside surveyor." In the correspondence which has followed, little objection has been made to this view of the matter. The evils which have resulted in case after case from the basing of agreements on bills issued by an independent authority are scarcely denied. The opposite evils, which may show themselves if bills issued by the architect of the building are *not* the basis of the contract, have been strongly insisted on in the letters we have printed. To make an architect's quantities the basis of the contract, so that the contractor can claim as extra all the labour and materials in excess of them which the building requires, is to do away with the one valid and reasonable argument against them, provided always that they are properly prepared.

On this matter of preparation our correspondents have enforced, by example after example, our own strongly-worded advice. "*Most decidedly we advise no architect to set up as a quantity surveyor unless he has had a quantity surveyor's education.*" This sentence has apparently escaped the notice of our controversial friends, who seem to fancy that we were advocating such items as "20ft. run of counter," or, perhaps, "60ft. run of nave, including columns, arches, and roof complete." But the fact that a man is an architect no more accounts for his turning out such measurements as these, than the fact that he is a surveyor accounts for his forgetting to "twice" his slating, or for his putting in "feet run" of rafters for "feet cube." We have known surveyors, both in London and the North, who have made these and many similar blunders; and we have known architects whose time was taken up in trying to help them out of the consequences of their own carelessness. But it would not occur to us to bring these things forward as an argument against the existence of quantity surveying as a profession. Division of labour is the fashion of the period. It has its advantages, and it has its drawbacks, and it is only fair and just that as far as they affect building matters, both should be brought to light in the pages of a building journal. Our contention is that architects, and London architects especially, do not know half enough about quantity surveying. The more proofs of their ignorance our correspondents bring forward, the more completely they make good our contention; and we hope these proofs will lead many architects emphatically not to take out quantities without knowing how, but to learn how, whether they practise the art or not. For want of knowing, their first estimates are fallacious, and their checking of final accounts is little more than a farce. The public see this, and call them unpractical. They find that the surveyor can really say what a building will cost, and so, in spite of his inefficiency in planning, construction, and design, they put their work into his hands. From such causes as this the architectural profession is being slowly bled to death. If it had a tithe of the energy which inspires these business-like gentlemen, the surveyors,

it would wake up and try to save itself; but it does nothing.

So much for the first question. The next is whether the (outside) surveyor who took out the quantities for a building, should ascertain the value of the work done from time to time, and give all the certificates except the last. This, however, is really two questions—not one. They appear to have been joined together in the discussion at the Surveyors' Institution, but they are naturally independent. It does not follow, because a surveyor is called in to tell the architect the value of the materials and labour down to date, that he should be made into a super-architect, with power to decree that the contractor is to be paid for them, whether or no. An outside surveyor has no responsibility for the building, and no personal knowledge of the way in which it has gone on. It may happen that part of the work he has valued has been condemned as bad; it may happen that part of it has been wrongly built, by the contractor's mistake, or even by his intention, in defiance of the architect. As we remarked in a previous article, the surveyor commonly tends to lean, at least a little, to the contractor's side—a tendency which, as the late correspondence shows, the contractor politely reciprocates, by leaning in return to his. As matters now are, we can all understand and allow for this; but what it might lead to if the surveyor had an absolute power of giving certificates, it is hard to say.

On the other hand, it is a profound mystery how an architect who knows nothing about quantities can ascertain even approximately what is due to the builder from time to time. Can anybody explain in what way he accomplishes it? It cannot, surely, be managed by cubing, which is the great refuge of the non-surveying architect, for how can he guess, in all sorts of different buildings, the proper price per foot cube when the walls, say, are a yard or two above ground, the different price when they are 10ft., and the different price again when they are 20ft., and a lot of masonry has been fixed? Probably he does it, in Bacon's phrase, "by a sort of happiness"—that sort which, in popular phraseology, might be called "happy-go-luckiness." The builder asks him for £1,000. He offers him £500, which is refused with indignation, and with an offer to produce proofs of the prime cost. Then the matter is discussed, dividers are brought out, and the actual height of the walls is compared with the height of the building when complete. A guess is made at the value of floors and staircases, plumbing, and glazing, finishings and fittings yet to be added to the part erected, and the amount so guessed at is deducted. Another guess is made at the value of any extra work that has been done, deeper foundations, more concrete, and the like. At last, between persuasion on one side and suspicion on the other, the amount of the certificate is settled, and the contractor goes off feeling that he has got less than he is entitled to, while the architect remains, fearing that he has given too much. As long as the contractor is solvent, little more is heard of the matter, till the process is repeated over certificate No. 2. But if he fails, and has been over-paid, the architect's position is not an enviable one. The agreement provided that the contractees should retain till completion 20 per cent. (say) of the money earned. That is what is in the bond. Nobody asked, when the agreement was prepared, how the architect was going to ascertain, at each of ten or fifteen consecutive dates, what this 20 per cent. would amount to. It was treated as the simplest thing in the world. No margin, no latitude was allowed him, and the law demands that he shall have done it with exactness. The law takes it for granted that, by merely opening his eyes and looking at the unfinished structure, he could immediately discern that its

value, say at 3 p.m. on April 1st, was £7,396 11s. 2½d., so that there was not the least excuse for him if he did not retain and keep back, on behalf of the contractees, one-fifth part of that precise sum. This is only another proof of the well-known fact that "the law is an ass"; but it is an ass from whose heels the prudent man will take care to protect himself.

If he took out his own quantities, the protection would not be difficult. But suppose they were taken out by a surveyor, whose duties with regard to them ceased when the tenders came in! It is no part of the surveyor's business to leave his own work, start off to the architect's unfinished building, take all the necessary measurements there, square them up, abstract them, and bring them into bill, and then cash them out at the schedule prices, and report the result. To do all this is no light matter; yet this, or something equivalent to it, must be done every time a really exact certificate is required. Who is to pay for it—not once only, but over and over and over again—in the course of every contract? If the employer is willing to pay—well and good. In the "conditions" for the Admiralty competition it was expressly stated that the architect would be relieved from the duty of ascertaining the proper amounts for certificates. But this was an exceptional case. The ordinary client would open his eyes very wide if he were told that he must call in a surveyor every time the builder required an advance. "If anybody has to be paid," he would assuredly say, "the architect must pay him." He would not inquire too curiously how soon the surveyor's charges, on this system, would entirely exhaust the architect's commission. He would not ask what was likely to happen when it had all been thus swallowed up, nor whether this would occur a little before or a little after the work was half completed. Perhaps the architect might suggest that as it was the contractor who wanted the certificate, the contractor would be the proper person to be charged with the necessary expenses of preparing it. But these expenses, if the system were rigidly carried out, would amount up to a very considerable sum—a sum, in fact, which neither client, architect, nor contractor could usually or reasonably afford.

A mechanical evasion of this difficulty has sometimes been tried. Certificates have been made self-acting. The conditions of contract, instead of stating that such and such a percentage of the value of the work will be certified for every time it reaches £500 or £1,000, have been worded in quite a different way. They provide that the builder is to receive a stated proportion of the contract sum when the walls are 10ft. above ground; another stated proportion when they are, say, 20ft.; another when the main cornice is fixed; and so on, by stage after stage, to the end. It has even been supposed that this system of fixed points will stimulate the contractor, and tempt him to make all possible speed from one refreshment place to another. We do not know whether this fancy was realised in practice. Before the days of railways, some ingenious person conceived the idea of a dog-post, which was to operate by similar means. The dog was to be harnessed to a light car, containing the letters. A long bamboo was to be fixed to the roof of the car, so as to project a yard or more beyond his nose; and from the end of this bamboo there was to be hung a pheasant or a partridge. The inventor conceived that the dog, finding the bird almost within reach, would eagerly rush forward to seize it. The faster he went, the faster the bird would go; and so, in theory, he would reach his first station with incredible rapidity. Here, that he might not conclude the pursuit to be vain, a leg or a wing was to be given him, and he then started off, as before, to capture what was left of the body.



The scheme worked well on paper, as does that which we have compared to it. In actual fact difficulties arose. They could hardly be absent on the self-acting certificate system. The walls might go up more rapidly than well. The work might be "rushed," and every detail scamped or forgotten which required time and trouble. One would expect an immense amount of patching and fitting, of correcting and making good, to be required before a structure carried out on this plan was really perfect and fit for occupation. So, on the whole, there seems nothing for it but to recognise the facts of the case and put them into the agreement. The architect should have to give certificates according to the best of his judgment, without measuring, or causing to be measured, the work that has been done at the date of the certificate. In colloquial language, he should be bound to make the best shot at it that he can. His certificate should be admittedly of the nature of a careful guess; and if either the employer or the contractor wants exact accuracy, the employer or the contractor, as the case must be, must pay for the surveying work, by which alone this accuracy can be obtained.

There remains the third question raised at the Surveyors' Institution: "Should the architect be the arbitrator under the contract?" This seems a question to be settled separately in every separate case, and to be settled mainly by the contractor. His answer to it will depend very much on his opinion of each particular architect's knowledge, experience, and fairness. If the contractor agrees to it—and he does agree more frequently than a man of business ignorant of building matters might expect—no one else is likely to object. On the face of the matter, the architect's interest is rather to favour his client than his builder; and if the builder lays his case before an independent arbitrator, and calls in professional assistance to help him in making out that case against the client, the architect is in a manner forced to act as the client's representative, and to say whatever can be fairly said against the case. But this is not so if it rests with him alone to give a final decision. If he is an honourable man, he will then do his utmost to be impartial. This may often be easy; but in special circumstances it may be hard, and it can hardly, therefore, be either expected or desired that the architect should usually be made sole arbitrator, at least in contracts of considerable amount.

#### ARCHITECTS' CRITICS.

INVENTION and criticism possess nothing in common—one is creative, the other destructive. They are two functions seldom found in the same person. A designer, painter, or composer is often strangely deficient in the power of critically examining his own work, or on what laws his own success depends. And so it comes about that the average critic, though he knows something about principles and methods, is by no means an artist, and it is as much a wonder to most people as it was to the tutor of Tristram Shandy that a man who knows not so much as the names of his tools should be able to work so skilfully. Dr. Latham, in condemning the usual school drill in Lindley Murray, observes that "gross vulgarity is a fault to be prevented by habit—not rules"; and Herbert Spencer has said that "a clear head, a quick imagination, and a sensitive ear will go far towards making all rhetorical precepts needless." So it is with critical rules—they have never made artists, but they have their uses nevertheless; there is generally some half-truth in the shallowest criticism. The architect has his own critics, and these are of several kinds. We have art critics—a large and by no means united army—engineer critics, who bring every question to the touchstone of commonsense or dry calculation, and the

general busybody, who has plenty to say about almost everything, from the merits of a picture or elevation to the size of a tank; then we have the "man in the street," who represents the average public opinion; the client and his friends, and the newspaper critic, all of whom make a formidable array of public opinion. Another distinction must be made between the learned and the shallow or superficial critics. We may say a few words about some of these. First, the art critic. He is generally a man who has a general acquaintance with artistic literature, moves in more or less limited an art circle, has perhaps written a few books, articles, and letters in journals, and whose plan is generally aggressive, under a pseudonym. He utters platitudes and deals largely in generalities, but never says anything about which he may be called to account. As long as he confines his criticism to pictures he does little to complain of; he dwells on the subject, the way it is treated, the composition, or the colour; he points out something wrong in the presentation of nature, atmosphere, or costume; he finds fault with the drawing and colour or atmosphere. Whether right or wrong, these points are questions more or less of taste or opinion, and not fact. But when he criticises a building or a design he is not on such safe ground. He assumes something which does not exist, or he finds fault with the design or style, or the size of the windows, the projection of a cornice, without knowing the conditions under which the architect had to work, or the real construction. He conjectures an opinion which has no foundation, and which the idle and ill-trained ear of the public is apt to accept as truth, and in this way his criticism does harm, and misrepresents. The critic of a public building which, probably, he has never entered, or the plan of which he has never seen, is very self-possessed; he cannot possibly understand the merits of the work. He may influence public taste for a time, but the worthlessness of his opinion is soon discovered. There are few of our readers who will not remember the severe criticism passed on Barry's Houses of Parliament, both when the design was selected and after the completion of the building. Column after column of diatribe and abuse were heaped upon that edifice, chiefly by the partisans of Classic or Italian Renaissance; its style, its detail, its elaboration, came under the lash of the critic; but with all its faults it has survived its bitterest enemies, and there are many, even of the same school, who are not slow to acknowledge its merits and the ability displayed in its design. The greater the abuse lavished on a good design the more its merits are revealed; they recoil on its traducers. So it has been with the Houses of Parliament, the design for the Foreign Office, the Law Courts, and many other public edifices which have been attacked by scurrilous and irresponsible writers. Somehow or other these censors attack a creation of their own brain; they fancy they have made a discovery, pointed out a bad imitation of some Classical work, or some solecism, which is really an error of their own when they know all. These self-assertive critics are generally slaves to some idea: they are sometimes purists who think everything wrong which does not fit in with their ideal example of a particular style. Even the late Mr. Fergusson possessed exaggerated notions of the 13th-century Gothic of Amiens Cathedral and the Parthenon, and could not see anything to admire in any modern architect's work—not even in St. Paul's Cathedral. Has he not somewhere said that the Parthenon at Athens is "the most perfect building yet erected by man": that it combines the three elements of the "Technic," the "Æsthetic," and the "Phonetic" in their proper proportions? Cologne, Rheims, Chartres Cathedrals, good as they are, are "not in it." So we have had other writers—Ruskin, for instance

—who have praised to an inordinate extent St. Mark's at Venice and all Venetian work. Lately we have had men who have paid their adoration to all that savours of Holland and "Queen Anne." Other critics, while objecting to mere purism, affect an independent air and set up an ideal of their own, any departure from which they condemn. We hardly know which class is the worst; they both express their opinions with authority, if not acerbity, proportioned to their ignorance of the real conditions. The engineer, or "matter-of-fact," critic, though less numerous, is almost as pugnacious; his strictures are, however, generally confined to the use, or misuse, of materials or faulty construction. He complains, for instance, of the scheme of drainage, heating or ventilation, and sundry other details which do not affect the general design. He delights to find fault with architects' work, his scientific knowledge, and to compare him unfavourably with the engineer. When any failure occurs this kind of critic is exultant; the architect knows nothing about his business, his girder or columns have been miscalculated—all the fault of not engaging an engineer, and so on.

"Public Opinion" is rather a hard task-master as well as fickle in its tastes. Great buildings have been alternately praised and found fault with; at first denounced or laughed at, then recognised, and last of all admired, and they and their authors have experienced the same change of feeling which the great statesman, literary man, poet, or painter has undergone whose works, lampooned during his lifetime, have been esteemed till after his death. And it is the same posthumous fame which seems to await every artist's work. While in matters of national policy the public often take the commonsense view in readjusting the balance of power, they do not understand architecture. The "man in the street" is only capable of appreciating such qualities as size, showiness, and other *ad captandum* features which appeal to the crowd. To his undiscerning mind it is of little use to put before him Classical proportions or good detail or any of those finer qualities which the artist can appreciate, as it would be just as much lost on him as a sonata of Haydn or Mozart. Yet there are uses in public opinion. The architect has to submit to it with as good a grace as possible. In matters of practical moment the public quickly discern. After the Courts of Justice were completed very numerous were the complaints about the access to the Courts, and especially their mode of ventilation. Want of sufficient egress from public buildings, narrow corridors, awkward stairs, inconvenient seats, draughty halls, and other defects are quickly discovered. In these things the architect can learn much from the average grumbler, and would do wisely to study his wants. The effect of this kind of criticism on the architect has been beneficial. It has shown him that he has more clients than one to serve; the public are really his judges, and censors when he carries out a public building, and if they are not his masters they can express themselves very strongly, and, if need be, rebukingly. No matter how beautiful as a work of art his edifice may be, if it offends in any points of utility he is quickly made aware of its defects, which all his architectural skill is unable to avert or atone for. In this way he is quite as much under the lash of the public as his brother artists the painter or the musician, for every one of his buildings can testify against him. One other kind of critic deserves a passing allusion under this head, as he is generally supposed to lead public opinion—we mean the ordinary newspaper critic—who has not had experience of the sensational paragraph writer—a man whose rashness and precipitancy exceed that of his knowledge of the real facts; a man who will rush into print



"where angels fear to tread," and discover all sorts of defects, exaggerate discoveries, or lament some act of so-called vandalism where there has only been timely precaution taken to prevent accidents. One of the most recent instances of this sort of criticism has been illustrated. A correspondent of a contemporary, whose enthusiasm for letting things remain as they are is only equalled by the clever sketches which accompany his remarks on some of our cathedrals and churches, has been sharply taken to task by one of our leading church architects and restorers, whose letter in reply to the strictures that have appeared has completely held up to ridicule the flippancy and exaggerated sentiment of tenderness of his critic, who has dared to venture to condemn the authoritative restoration of one of our most valued church spires without the barest knowledge of facts. There have been occasions when wholesale and destructive restoration has been carried too far; but for a newspaper correspondent to complain of the deposition of certain sculptured stone figures from the base of the spire of St. Mary's, Oxford, which has suffered much from decay, and has given cause for well-grounded alarm, is too ridiculous. Yet this is the sort of hasty criticism which architects intrusted with the restoration of our monuments have to combat. While both the medical practitioner and lawyer are exempt from the interference of these meddlesome inquisitors in their spheres, architecture is considered an open ground for their liberty of thought and action. These busybodies are for ever active when public opinion has to be aroused. Disraeli has declared that the "public never think; they have no time," and that we live under the "empire of general ideas." Under the sway of these ideas, shallow and weak as they are, the artistic treasures of our time have to contend. Our best novelists, dramatic authors, and poets have to submit to the lucubrations of men and women who have only a very superficial knowledge of their vocations. "Opinion, the sovereign mistress of effects," is keenly sought, even by our ablest men; but architects and others can be reassured by the counsel of King Henry: "Things done well, and with a care, exempt themselves from fear."

#### PROVINCIAL AFFILIATION.

ONE of the principal topics discussed at the conference of architects at Manchester was the obedience of provincial architectural societies and presidents to the London Institute. As long as we have known the feelings and inclination of the provincial practitioner, the question of affiliation with the parent institute has been an open one. Metropolitan practice and methods have no doubt a certain influence over those who practise in the country; there are questions of professional routine and custom relating to various subjects which require to be settled by the central authority, but there are other points over which a central control would be prejudicial to the individuality and independence of local societies. In fact, we are doubtful whether, if these were all united under the autocratic control of a Metropolitan centre, there would not be something of the disadvantages attending all imperial governments. The independent action of local societies hitherto has been, on the whole, beneficial; it has been the means of uniting for local purposes men of various views—architects and surveyors together—with the object of formulating rules and methods of practice. Any dictatorial authority exercised by a London body, or any submission on points affecting provincial customs, would lead to rupture. Take, for example, a question like that of competition.

It would not be reasonable to expect every provincial architect to agree to a set of rules like those drawn up by the Institute for the conduct of competitions, as to the moot point of assessors, or as to premiums, excellent as they are in the interests of London architects and of men who have made a name. Then the question of "quantity-taking" has always been a debated one. Provincial architects are in the habit of preparing quantities for their own buildings at least. The custom has been found, no doubt, advantageous in certain ways. It has enabled the architect to keep the quantities of material and labour under his own control, and has given him a voice in deciding disputed points or adjusting differences. The practice has also been found remunerative. Again, the provincial practitioner does not care to be tied too strictly to rules of etiquette, which find acceptance amongst the more favoured circles of London practice. He is also willing to accept lower premiums and commissions. Any outside interference with these discretionary powers of the local architect would be resented. It would be impossible, we think, to expect in the present state of the profession any unanimity in these matters. Mr. Salomons, in his paper, passed over these points, and only dealt on the general advantages of being united to the central authority, which may be admitted theoretically. As to the present mode of election to the Institute, no provincial architect, whether in good practice or not, would care to be voted for by young men who had been, perhaps, brought up in his own office, or had been draughtsmen in it, though they had now become members of the Institute. But the leading questions with the provincial architect are: "What advantage am I likely to derive in my professional practice by being a member of the Institute? Will it improve my abilities, or make those who are likely to employ me think better of me as an architect?" For a president of a local society, it may or may not be an advantage, though the President of the Liverpool Society is not a member, and is certainly none the worse for it. Mr. A. Culshaw, the past-president, put a very plain question. He asked, "What good is the Institute membership in the provinces to those who belonged to local societies?" He thought they would have "a great difficulty in convincing provincial members that they could derive much benefit in the present position of the Institute in relation to the allied societies by becoming members." Mr. John Holden, the president of the Manchester Society of Architects, admitted that the provincial architects obtained through their local societies "many of the advantages which the Institute had to offer," though he advocated that provincial societies should act as "feeders" to the parent society, and that every president of a local society ought to be a Fellow of the Institute. These admissions and opinions hardly apply to all outsiders; the ballot at present required is not the kind of election that can be tolerated by every architect who had credentials to show as to his capabilities and experience; as another member said, it was easier to keep a man out of the Institute if a ballot was demanded than to get him in. The artist particularly felt this difficulty of election. Qualification is the only basis on which membership or affiliation can rest. The artist and the specialist must both be recognised, but they could hardly be by ballot as it is at present conducted. The "art-architect" knows he ought to be admitted, but the present system does not favour him. Consequently he is satisfied to remain outside. So long as he sees other men less able than himself Fellows of the Institute, it is not very likely that he will make any effort to covet the distinction of membership of a body which includes a large number of men with whom he cannot be in sympathy. These are insuperable

obstacles in the way of joining a body who have no legalised powers to give effect to the prestige they offer. If membership guaranteed the exclusion of all incompetent architects, and possessed the further advantage of securing public patronage, the case might be different. The public at present care very little for any professional body who have no legislative power; they are ready to engage anyone as a doctor, a lawyer, or an architect who can offer them service on the most reasonable terms. We have instances of this unconcern for professional status in the employment of quacks in medicine by a large class of the public, of incompetent tradesmen, and even of builders to design their houses and shops. So long as men can be found who will prescribe, or design, it matters little with some people whom they employ. He may be a member of this institute, or that society, or not—it does not matter. "Is he competent?" "Has he cured any patient?" "Has he designed a convenient building?" These are the main considerations with the public, who judge by what a man can do, or has done, not by any inquiry as to his professional status, or the number of initials he appends to his name.

#### ARCHITECTURE AT THE SALONS OF THE CHAMP DE MARS AND CHAMPS ELYSEES.

THE section of architecture at the Salon of the Champ de Mars, although containing only a limited number of selected drawings and sketches, is, nevertheless, almost more interesting than the more important section of architecture at the Salon of the Champs Elysées. At this latter salon are exhibited the strictly classical designs and studies of present and past followers of the Ecole des Beaux Arts, most of whom have remained faithful to the parent salon. At the Champ de Mars we find the works of those architects who, like their brother artists, the painters, have wished to strike out on new lines with modern ideas, leaving classicism aside in their endeavours to produce free and original styles, brought about by a larger use of the various new materials available at the present day, or by free and unhampered ideas of rational art.

At the Champ de Mars the section of architecture is closely allied to the important one of decorative art and art objects, and although this year there are few exhibits in the latter section which may claim to be very closely attached to architecture, yet it is the intention and endeavour of the committee of architecture to arouse the interest of the public by including in the rooms containing drawings of architecture all exhibits of work and decoration which, by their nature or form, adapt themselves to architectural purposes, and thus exhibit and explain in solid form the realisation of portions of the designs hanging on the surrounding walls.

M. de Baudot, president of the section of architecture, and leading spirit of the movement in favour of a modern treatment of design brought about by the rational use of modern materials adapted by their fitness to the needs of the present age, exhibits a design for a country house. As is the case with nearly all of the work of this architect, the designs appear somewhat wanting in effect on paper—either, perhaps, because the breadth of treatment and the cleverness of rational design cannot be well expressed in drawing, or possibly because we are so habituated to the vigorous style of drawing and colouring *à la mode* of the younger school, that we cannot properly appreciate the much more sober rendering of an older architect like M. de Baudot. Be it one reason or another, the apparently uninteresting designs on paper are marvellously effective and harmonious in execution. In this country house the architect has succeeded in employing to the best advantage a number of the new methods of construction now fast gaining ground in France, such as hollow walls, adapted for heating and ventilation purposes, as well as other constructive conveniences; floors, partitions, and roofs constructed of cement armé or iron trellis imbedded in cement; glass bricks for lighting and ornamental purposes, coloured and ceramic glass of the latest invention, and a large use of ceramic work for the decoration of the



façade. A chief point of the design consists of a spacious hall surmounted by a cupola constructed of light materials, such as iron and cement arranged in a manner well adapted for receiving a brilliant and effective polychrome decoration. In collaboration with M. Portevin, the same architect exhibits a scheme for the reconstruction of the Hotel du Lion d'Or, at Rheims, in which the employment of similar materials and methods results in a façade of pleasing silhouette, and of an effect very different to the ordinary style of traveller's hotel.

M. Bruneau has a design for the new Palais des Arts, proposed to be erected in the Champs Elysées, in which the architect has endeavoured to solve, in a pleasing manner, the difficult problem of producing a good effect in the decoration of the blind façades of top-lighted buildings. His success is somewhat doubtful, and the treatment scarcely rational, for the immense false bays, although very skilfully decorated, persist in giving the impression of large windows ingeniously fitted, in despite of the explanation that these bays are simply decorative fittings between the buttresses supporting the roof trusses. A novel feature is the arrangement of the semicircular apsidal at the extremities of the sculpture galleries, constructed entirely of glass bricks of pleasing shape.

The public, which gives but a passing glance at the drawings it does not understand, is attracted and interested by the large and coloured wood and plaster model of a scheme for transforming into a covered hall, the courtyard of Haarzwilens Castle, at Utrecht, exhibited by M. Benouville. An ingenious system of wood fan-vaulting rises from each of the four angles of the courtyard, uniting in a large centre-piece filled in with coloured glass. Pierced bands unite the vault ribs horizontally with vertical spandrels filled-in with colored glazing. The ensemble is exceedingly good, and a sculptured wooden gallery on brackets occupying two sides of the hall adds to the pleasing effect.

M. Guimard occupies a considerable surface with a large series of water-colour perspectives and studies made during the enjoyment of a Salon travelling scholarship in England, Scotland, and Holland. A large proportion of the sketches consists of country houses and villas existing in various parts of England, forming an interesting study of the domestic architecture of some of our well-known English architects. M. Guimard also exhibits a very ingenious scheme for the Exposition of 1900, consisting of an artificial hill covered with various buildings, theatres, and restaurants of very original design, dominated by a lofty iron tower of a new and graceful form.

M. Herbert Lucas has a design for a country house at Newport, U.S.A., a type of American domestic architecture, but somewhat more regular and Classic in plan than is usual in English and American villa plans.

M. Calinaud has a design for a country house to be constructed of brick and cement armé. The system of roofing is ingenious, if not practical; the roof planes, instead of sloping towards the exterior walls, descend inwards and meet in a kind of modern impluvium useful for storing rainwater.

M. Garas exhibits drawings for the construction and decoration of an artist's dwelling—designs which are interesting as indicating a remarkable creative talent and great skill in drawing and colouring a number of highly original and fantastic ideas, inspired, according to the artist, by the decadent literature of to-day. The sections show a series of ingeniously vaulted rooms, with numerous narrow windows which light in a dim, mysterious manner the curious and enigmatical designs for wall-hangings, furniture, and mural sculpture decoration.

M. Lucien Roy exhibits his proposed restoration of a portion of the Chateau de Langeais, near Tours, first built by Pierre de Brosse, chamberlain of Philippe le Hardi. The drawings are executed with the great care and precision remarkable in those of the Monuments Historiques.

Amongst the exhibits of those architects who indulge in artistic dreams and flights of fancy are the sketches of M. Guillemonat, a series of very clever imaginings of decorative architecture in which the human form plays an important part.

"The Refuge of Dreams," by M. Provensal, is a wonderfully clever piece of work, skilfully expressed. An immense building dominating a mountain, and placed in striking relief against the sky, forms the mysterious temple of fancy. The plan and elevations of the building are so

composed as to give in ensemble the shape and silhouette of a gigantic crouching sphinx. These studies of a spherical form of architecture, most ingeniously arranged to obtain the effect of the sphinx-like ensemble, recall the attempts made nearly a century ago by Ledoux, an example of which remains famous in the theatre of Besançon.

M. Bischoff evidently finds the theatre of Bayreuth too modest in style for meriting the execution of the works of Wagner, for he has imagined something more than a theatre—a temple devoted to the execution of the opera "Parsifal." The style is original, Romanesque in treatment, and the drawings are vigorously coloured with considerable artistic feeling.

MM. Pierre and Tony Seltersheim, collaborating with M. Paul Berthon, exhibit their designs for a gallery of an art amateur, for which a premium was awarded in the competition organised by the Arts decoratifs. M. Pierre Seltersheim has also an interesting series of pen-and-ink drawings of the ruins of Valmont Abbey.

Amongst the drawings of less interest as regards originality is a good study of a scheme for the restoration of the Church of Vigan, by M. Gout; a design sent in by M. Vincent for the competition of the Cairo Museum; an interesting design by M. Alfred Besnard for an exhibition restaurant, presenting a certain amount of originality obtained by the use of a light and rational construction of metal; a painter's studio, by M. Riviere, with top lighting and blind walls, very skilfully and ingeniously decorated; an interesting design for a theatre, by M. Polti; and a villa at Enghien, by M. Gardelle.

MM. Galland and Gibelin exhibit in a special gallery arranged at the extremity of the sculpture garden their magnificent twelve stained-glass windows, representing the episodes in the life of Jeanne d'Arc, and destined for the Orleans Cathedral.

At the Salon of the Champs Elysées we enter into the domain of classical art, the traditions of the Ecole des Beaux Arts, and the souvenirs of the Grand Prix de Rome, with their immense "tartes" of classical studies and restorations.

M. Louis Sortais, winner of a recent Prix de Rome scholarship, and now continuing his studies of Classic art in Italy, exhibits a number of large drawings illustrating the existing ruins of the Canope of the Villa Hadrian, and the scheme of restoration proposed by the young architect. The task is rather an ungrateful one, for this building is very hybrid in style, and combines the orders of Roman architecture with souvenirs of style brought back from Egypt by the builder of the villa, forming, therefore, a kind of Renaissance in Roman art. M. Sortais has, however, succeeded in making his measured drawings and details of restoration very interesting. The work is conscientious, and cleverly drawn and coloured.

M. Boussac exhibits a Theban tomb of the 18th dynasty, a number of mural paintings, reproducing with an apparent faithfulness the style of the decoration of the walls of the tomb of a rich inhabitant of Thebes. The paintings comprise a number of subjects, such as agricultural work, field-work, reaping, and grape-gathering, hunting scenes, and musical festivities. The proprietor of this tomb, according to M. Boussac, was an attaché to the Temple of Ammon at Karnak, in all probability an astrologer. His wife, a chorister at the same temple, occupies the tomb by the side of her husband.

M. Emile Bertone, another Grand Prix student at Rome, sends a number of most interesting and beautifully-drawn restored details of some of the Roman temples, such as a capital of the Temple of Mars at Rome, capitals and bases from various buildings at Pompeii, and a well-drawn frontispiece composed of fragments, offering a comparison between various Roman tombs, including several due to Michel Angelo and Vasari.

M. Amedée Milvoy, inspector of historical monuments of Algeria, exhibits drawings of the present state of the ancient theatre of Djemilah, in the province of Constantine, the excavations and researches of which were commenced by the late M. Emile Boeswillwald, chief inspector of historical monuments of Algeria.

M. Adrien Rey exhibits drawings for a monumental staircase in a palace. The composition and style are exceedingly well studied. M. Paul Normand sends a large number of very interesting and well-coloured sketches of Italian architecture. M. Hannotin has a large study in perspective for the interior of a church in Byzantine style, drawn and coloured in the vigorous and highly artistic style for which this young

architect is famous. M. Leon Chiffot exhibits his very original design for a monumental entrance to a capital, design which gained the first prize in the Leclerc competition at the Ecole des Beaux Arts. M. Janty exhibits ensemble and detail drawings for the magnificent private mansion he has just completed at Paris for Prince Roland Bonaparte. M. Dusart has an interesting design for an exposition palace; M. Brun perspective sketches of three exceedingly pretty villas lately erected in the south of France; and M. Ridet drawings of the Fine Art Museum at Laval, which has won for this architect the Prix Duc, a prize awarded each year by the Academy of Fine Arts for the most interesting building executed in the year.

There are several interesting and original designs sent in for the "Figaro" competition, and a large number of measured drawings of the actual state and proposed restoration of some of the most interesting historical buildings of France. Amongst these may be mentioned measured sketches of the Archer's Tower at Cambrai, by M. Doutreligne, destined to illustrate a work on the fortifications of the North of France; the church of St. Mark, at Deux Sevres, by M. Henri Deverin, architect to Historical Monuments, a set of measured drawings ordered by the Historical Committee for including in an interesting work entitled "Archives." The staircase of Francois I. at Abbeville, measured and drawn by M. Pierre Vinson, Inspector of Historical monuments; the Palais de l'Ombrière at Bordeaux, measured by M. Georges Bacot for the committee of historical monuments; the Castle of Tierce, by M. Easton Girault, drawings destined for a monograph of this ancient castle; the monograph drawings of the Chapel of St. Michel d'Aiguille, by M. Verdier; and several others less important, but not less interesting. All these drawings are remarkable for the great care and conscientious work evident in the preparation of the elevations, and the clever colouring of the sketches of existing buildings; such extreme precision is, however, a *sine qua non* for all drawings destined for the Committee of Historical Monuments.

The open galleries surrounding the sculpture garden are well filled with drawings of architecture and designs of all kinds, most of which, however, are of less importance and interest.

ARTHUR VYE PARMINTER.

## STEEL FRAME CONSTRUCTION FOR CHURCHES.

THE employment of iron and steel in the erection of the modern office buildings and business blocks has become so common in the larger United States cities that what is known as skeleton frame construction is now to be found in connection with almost every kind of building of importance which may be designed. The skeleton system has been found so well adapted for tall structures by reason of the saving in the thickness of the foundation walls necessary to support the loads placed upon them, thereby increasing the ground space available for use, while at the same time adding to the fireproof qualities of the building, that it is being employed in the construction of some of the more palatial city residences, and also in the erection of church edifices. Our engraving, for which we are indebted to *Carpentry and Building*, shows the skeleton frame of the new church of St. Mary the Virgin, reproduced from a photograph taken during the process of construction and before the masonry work had been much more than commenced. The building, located on a plot of ground fronting 125ft. on West Forty-sixth-street and about 94ft. on West Forty-seventh-street, New York, has just been completed. In the erection of this edifice the employment of the skeleton system is said to have brought the cost to a figure somewhat less than would have been that a building of equal size constructed entirely of brick or stone, while occupying less time in the execution of the work.

The frame of the church is of rolled steel throughout. The main columns, resting on masonry piers, and made in two sections, rise to a height of 90ft. The main frame is 46ft. wide, its greatest length 180ft., while its height from the basement is about 115ft. The height to the top of the cross over the main gable is 130ft., and the vaulted roof is 80ft. Probably one of the most interesting features in connection with this edifice is the groined ceiling, which is com-





posite in construction, being of cement stiffened with iron bars supported on the diagonal and transverse steel ribs, which also serve as braces for the columns. The ceiling consists essentially of a series of dormer windows on each side of the building, and connecting them are other arches. The principle is that of a French groined arch, and it is believed that this is the first example of the kind ever executed in iron. The arches are formed of curved angles, attached to which are round bars, these, in turn, having fastened to

them the wire cloth employed as lathing, to which the plaster is directly applied.

The ironwork was supplied and erected by Messrs. Edward Corning and Co., of 33, Broadway, New York City; while the architects of the building were Messrs. N. Le Brun and Sons, of the same city. The style of architecture is 13th-century French Gothic, and the front and all visible walls are of Indiana limestone. There is an ambulatory a little more than 7ft. in width extending entirely around the church, making

the width of the building up to the height of the ambulatory walk about 60ft. The ambulatory walks are 28ft. high, and above that height the walls of the clerestory, built in between the steel columns with brick and faced with stone, rise 52ft. more, or to a height of 80ft. above the floor beams.

New board schools for 153 infants are about to be built in Island-road, St. Ives, Cornwall, from designs by Mr. Oliver Caldwell, of Penzance.



DESIGNING OF STEEL BRIDGES,  
THEORETICAL AND PRACTICAL.  
—XXX.—(Concluded.)

WE have reserved for the present, and concluding, article such practical details and drawings as will be sufficient to incorporate in the design selected for an open-web steel trussed bridge, all those theoretical data and considerations previously arrived at. It will not be necessary to enter into the question of the designing of the cross girders, since the load upon each can be readily ascertained from the tabulated total of the separate loads given in Article XXVI. The designing of the cross-girders was fully investigated when treating of steel-plate bridges. Keeping the depth at the usual ratio to the span for plate girders—that is, making as before,

$$D = \frac{S}{12}$$

the depth of the cross girders in the present example equals 2ft. It will be seen that the mode of attachment of the cross-girders to the main girders is not so simple when the type of construction of the latter is altered from a plate girder to an open-web trussed girder. All the calculations for finding the stresses upon the flanges and web of the cross-girders, together with the corresponding necessary sectional areas, have been already enunciated. It only remains to substitute the different dimensions and different loads obtaining in the example of cross girder before us, as shown in the drawings, to determine the amount of metal in the different parts of the flanges and webs.

The general arrangement of the bridge is represented in Fig. 1, which is a longitudinal section taken through the centre of either the up or down track. At each of the lower apices, that is at the junction of both the upright and diagonal members of the web with the lower flange, are placed the cross girders shown in section by the letters C C C C. Between these cross girders are riveted up rolled joists. These run in a longitudinal direction the whole length of the bridge, and are placed, centre for centre, exactly under each rail of each track. As the span of these longitudinal stringers or rail bearers, marked R R R in Fig. 1, as they are appropriately called, is comparatively quite insignificant, not exceeding for bridges of ordinary spans some ten or twelve feet, they are frequently simple whole balks of timber. It is, however, preferable to make them of iron or steel, as their removal, when of timber, which must occur periodically, owing to deterioration and decay, is an awkward and troublesome job. The two methods of attaching the rail-bearers to the cross-girders—either by placing them on their upper flange, or riveting them in between—have been previously fully described and illustrated. In the present example, the rail-bearers are riveted in between the successive cross-girders, which is the more usual arrangement, since the question of headway generally prevents them being placed directly upon the upper flanges of the cross-girders. This built-up combination of parts will be better understood on reference to the general cross-section in Fig. 2 and other details shown in Figs. 3 and 4. Between the rail-bearers, and consequently parallel to the cross-girders, is fixed the platform or floor of the bridge. In this example, the arched steel plates have been dispensed with, and the system of corrugated-steel flooring introduced, which possesses many practical advantages. It may be made equal to the full depth of the rail-bearers, as shown in one half of the elevation in Fig. 1, or the depth may be decreased accordingly, as circumstances may dictate. The strength of all the various descriptions of trough-flooring for bridges is very great, as each separate trough acts as a small independent girder, and at the same time assists its neighbours with its support and resistance, should they become subjected to any suddenly-applied violent shocks of an impactive nature. This description of flooring or bridge-decking, as it is sometimes called, can be used in some instances without either cross-girders or longitudinal stringers or rail-bearers. It may, in fact, be laid continuously transversely to the axis of the bridge, with the two main girders as its abutments or *points d'appui*. Care must be taken that the depth and pitch of the corrugations and the thickness of the metal are properly proportioned to the dead and live loads to which the decking will be exposed. We have one piece of practical advice to offer to our readers regarding the employment of corrugated steel bridge-flooring

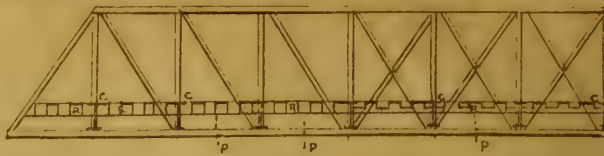


Fig. 1.

and decking: On no account cut down the thickness of the metal. The patentees and manufacturers of this form of bridge-decking who are, after all, the people who know most about its carrying capabilities, publish the proper dimensions of each section, according to the span and load it is designed to support. We have known two or three cases in which, from an idea of false economy, a section has been selected of a thickness less than that which the manufacturers guaranteed as suitable for the work required of it. Such a course is manifestly unfair to them, as the deflection of the troughs under trial exceeds what is its fair amount under its fair load, and the blame is put upon the material, when it really belongs to the person who deliberately chose a section too weak for the load placed upon it.

A general cross-section of the bridge is represented in Fig. 2, which is almost self-explanatory. In order to form a bed or bearing for the cross girders on the main girders, steel plates, B B, of a thickness not less than  $\frac{1}{4}$  in. are riveted on to the upper horizontal rib of the inside channel-iron of the lower flange of the main girders. In

girders by a tee-iron, 6 in. by 6 in. by  $\frac{1}{4}$  in., bent or cranked over the table part of the upper flange, as shown in the letters T T in the general cross section. The whole connection of the main and cross girders is very well exhibited in Fig. 4, which is an elevation of the arrangement adopted to an enlarged scale. The letters of reference are the same as those belonging to Figs. 2 and 3. In a sense, the cross girders may be said to be partly suspended from, and partly supported upon, the main girders. There is no doubt that the chief stress is borne by the small cantilever projections, B B, from the lower flanges of the principal girders, although the attachment by means of the cranked tee-iron relieves the lower rivets of some of their shearing stress, and unquestionably adds to the lateral rigidity and general stability of the whole junction.

It might be argued that a much simpler connection could have been made between the main and cross-girders by placing the latter in the middle of panel lengths, or at the points, P, P, P, in the elevation in Fig. 1. So, no doubt, would be the case. A small cast iron saddle, or what would answer equally well, a short bit of hard

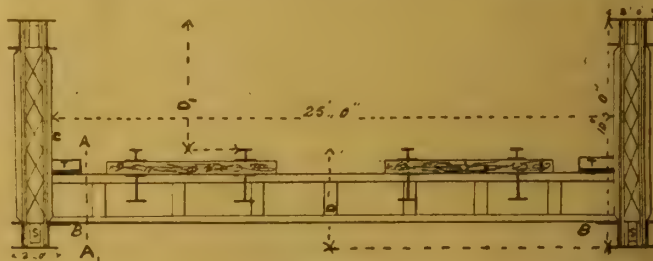


Fig. 2.

addition to being riveted to these bed-plates, as they may be termed, the cross girders are connected to the main girders by other attachments, which will be described when we allude to the details of the whole connection shown in Fig. 2. Bridges of the description under notice, when they are of sufficient span, and consequently of sufficient depth, are usually braced overhead at intervals of about one-fourth of the span by a small arched plate or lattice girder, which is riveted up to the upper horizontal table or plate portion of the flanges of the main girders. The railway bridge of the London, Chatham, and Dover Railway over the Thames at Blackfriars is braced overhead in the manner already described.

Referring to Fig. 2, it will be seen that it would not be possible to introduce a similar system of overhead bracing. In the present days of short-funnelled locomotives, when the "blast" does the duty of the old tall flues or chimneys, about 12ft. or 13ft. of headway are required above the rail. The depth of the main girders in our open-web truss is 10ft. from out to out. If we deduct from this dimension the depth of the cross girder, of the transverse sleepers and rails—that is, the total depth D, in Fig. 2, it will be found that the remaining available headway D, will be far too small to permit of any overhead or "sway bracing," unless an almost semicircular arch were adopted, which in other respects would not answer the purpose. To all trussed girder-bridges of similar limited dimensions in depth, American engineers give the name of "pony trusses." As one familiar to our readers we may point out the bridge of the South Eastern Railway over the Thames at Charing Cross. A vertical section of one of the cross-girders through the line A A, in Fig. 2 is given in detail to an enlarged scale in Fig. 3. The lower flange of the cross-girder is riveted through both angle-irons and plates to the bed-plates B B, while the upper flange F of the cross girder is connected to the channel-iron of the vertical struts in the web of the main

timber cut from a solid balk, could be laid in the space between the vertical channel irons or trough sides of the lower flange at S in Fig. 2, as is under conditions differing from those in the example under notice, frequently carried out. In that instance the attachment is simply reduced to superimposing the cross upon the main girders, and the job is finished. But this simple method of effecting the requisite connection cannot be employed in the type of truss selected, for reasons which will be apparent to those who have perused our series of articles on this subject. Transverse stress, unless of a very trifling amount,



Fig. 3.

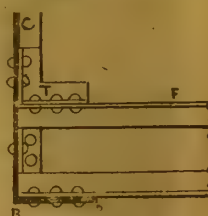


Fig. 4.

is of a character forbidden in every description of trussed beam girder or roof frame. Every member of these structures, whether they be simple or compound, is not permitted to undergo a stress of tension, compression, or of a shearing character except in the direction of its length. If, as often has been done in the early days of the "application of wrought iron to building construction," this condition be either ignored or violated, then the particular advantages accruing to the employment of them are altogether lost, and it would be far preferable to use solid beams and girders as substitutes for them. To apply these



theoretical principles to practice, let us assume that the cross-girders are placed at the centre of each panel-length of the truss at the points PPP in the elevation in Fig. 1. It is manifest that in the first instance the whole weight of each panel load, equal to about 16 tons, must be borne by that portion or length of the lower flange or panel-length situated between the successive lower apices of the truss. It is not difficult to ascertain the stress upon the central part of the panel-length under these conditions of load. If we put  $W$  = weight at centre of each panel-length,  $L$  = span in feet,  $D$  = depth also in feet, the formula is, making  $S$  = stress in tons—

$$S = \frac{W \times L}{8 \times D}.$$

Taking  $W = 16$ , which is a safe practical load, although a little in excess of the actual load for each apex,  $L = 8$  ft. and  $D = 0.75$  ft., the equation becomes—

$$S = \frac{16 \times 8}{8 \times 0.75}.$$

From which, cancelling and reducing—

$$S = 21.3 \text{ tons.}$$

Since each panel-length may be regarded in the light of a small beam supported at each lower apex, the deflection arising from so great a load at the centre would be too great to insure safety, in addition to violating, as previously mentioned, the whole principle of this particular type of bridge construction.

The assumption is sometimes made that, instead of regarding each panel-length as a small independent girder, it is more correct to consider the sum of the successive panel-lengths, or, in other words, the whole span of the truss as a continuous girder. Under these conditions the apices of whichever flange carries the load directly represent virtually the separate piers of the whole bridge. The objection to this assumption is that the essential characteristic, the *sine qua non* of a continuous girder is that the intermediate piers should be absolutely rigid and immovable. This condition does not obtain in open-trussed web girders, as each of the imaginary piers must deflect to some, although no doubt to a very small, extent under the action of a heavy rolling load. It is true that the points of support, or, in the case of each panel-length, being regarded as a small independent girder, the abutments will also deflect slightly, but the amount exercises no appreciable effect upon the structure. A deflection that would be fatal to an arch and dangerous to a girder or truss built on the continuous principle, may be safely disregarded in an ordinary horizontal structure of one span.

If the deflection be temporary, it will recover itself, and the elasticity of the material will be sufficient to counteract the extra strain, and if it should be of a permanent nature, it is a simple matter to raise up the lower end of the girder by screw-jacks, or, if necessary, by other mechanical appliances; wedge it up, and the whole system is at once restored to its original level.

We now bring our articles to a conclusion, not without the hope that they have afforded information to all, as well as instruction to many of our readers. In them we have endeavoured to inculcate the necessity that exists for a thorough acquaintance with, and an accurate knowledge of, "first principles." Although a great deal has been accomplished in the last generation towards rendering easier and less thorny the path of the student and learner, yet there is not, and never will be, any royal road to knowledge. It matters little or nothing whether it be a question of profession, business, or trade; the groundwork must be acquired, and in order to do so, a large amount of downright hard work, and even in some instances actual drudgery, must be submitted to and gone through. We avail ourselves of this opportunity of urging upon our younger readers the necessity of acquiring first principles—or, in plain language, their general and technical education—early in life. It is next to an impossibility to make up for neglect in this respect as men advance in age. It is true there have been a few—it may be said a very few—who in mature age have acquired great proficiency in both the subjects of science and mathematics and in the gentler *litera humaniores*. But such instances are rare, and, besides, may be regarded as true examples of the old motto: "*Exceptio probat legem*."

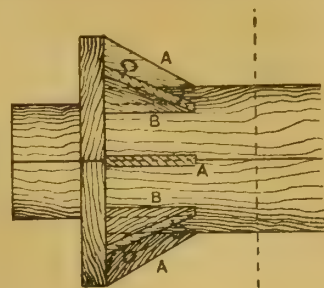
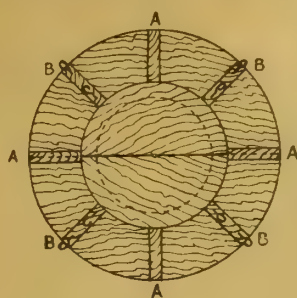


Fig. 85.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXIV.

By JOSEPH HORNER.

CAST-IRON pipes have much in common with columns, both in reference to the preparation of the patterns and of the moulds. Of course, no one attempts to make pipes in quantity except the regular pipe-founders, who have special plant for the purpose. But there is a good deal of odd pipe-work wanted, for which the services of the nearest jobbing foundry have to be requisitioned. There are odd make-up pieces of pipe—that is, lengths which are not standard, like 9 ft. or 6 ft. lengths, and often also awkwardly-shaped bends which are required to clear projections in the way, tees at various angles, pipes with flanges or sockets, other than to standard dimensions. All these occur in the general run of a builder's and contractor's work, and they often have to be made in haste. The following remarks will cover most of the cases which are likely to arise.

In reference to straight pipes, the remarks made

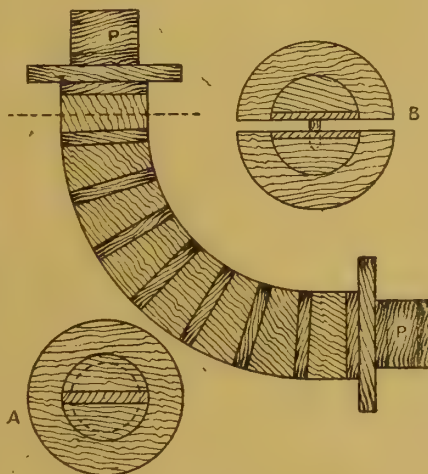


Fig. 86.

relative to columns are generally applicable. The patterns of small pipes are made solid; larger ones are jointed, either in solid stuff or else lagged up. Brackets behind flanges must be left loose when they stand diagonally in relation to the lift of the patterns, Fig. 85. In that figure the brackets A will be fastened, but B will be skewered on, as shown. Pipes, like columns, can be shortened by shifting the flanges without cutting the pattern; sockets can also be shifted. It is not necessary to make a core board for a straight pipe, because straight boards are kept in foundries, but it is necessary to make core boards for socket pipes. Bolt-holes are cored, either with prints, or by means of a stopping-off piece, with slot-holes cut to correspond with the core centres. Large pipes may have their patterns struck in loam, with flanges made of wood. These details have been illustrated in the three preceding articles relative to column patterns.

The patterns of bend and offset pipes are costly to make, hence full patterns are only constructed when several castings are required. These patterns are cut from solid stuff, and jointed, the method of lagging not being applicable to these. For standard work, iron patterns are nearly always used, but it is not always known, even to all moulders and pattern-makers, that good true castings can be made from skeleton-

pipe patterns, constructed like Figs. 86 and 87, by which the cost of pattern-work is reduced, perhaps one-fourth at least. A piece of board of say, 1 in. thick, is cut to the curve and outline of the pipe, and numerous blocks are cut to the radius corresponding with the outside diameter of

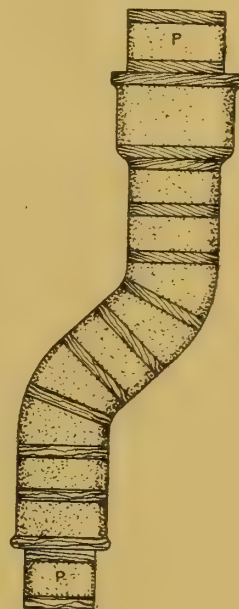


Fig. 87.

the pipe, and are nailed upon both sides of the board; flanges and prints are added. The spaces between the cross semicircular pieces are filled up with sand by the moulder, and smoothed over to correspond with the body of the pipe, as shown in Fig. 87, and the pattern is then moulded from. The pattern made thus may be unjointed for pipes up to about 6 in. diameter, as in Fig. 86 A; above that, it is better to make the board thickness in two, dowelled, so forming a joint in the

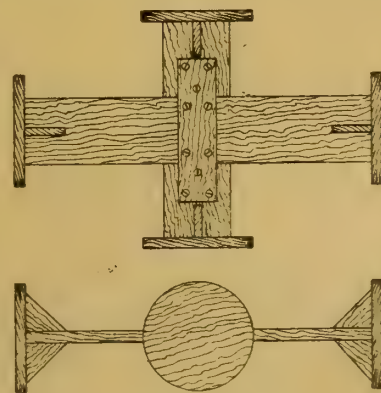


Fig. 88.

pattern, as at B. Fig. 87 shows a skeleton pattern of an offset pipe, with socket and spigot. Patterns of this kind can be readily made by any carpenter.

It is not always necessary to go to the trouble even of making patterns of this kind. In any large town foundries are to be found in which castings can be made from templets. They are not moulded from the templets; but the informa-



tion afforded by the templets is sufficient to enable the moulder to work without a pattern by the aid of a few strickles, and flanges, or sockets. The general routine of the work is as follows: Four templets, types of others also, are shown in Figs. 88-91. Fig. 88 is a templet of a four-way-flanged pipe; Fig. 89, one of a socketed branch

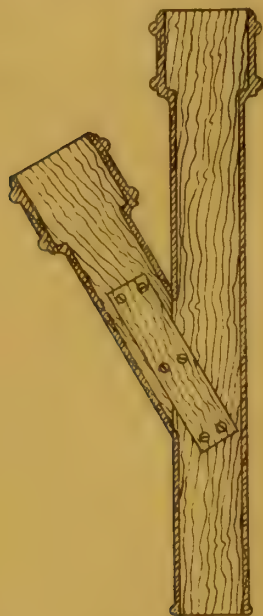


FIG. 89.

pipe; Fig. 90, one of a flanged bend; Fig. 91, one of a socketed offset. In each case the templet has been fitted into the place which the pipe casting has to occupy. The outlines are not necessarily very exact, being sufficiently near if cut with a band-saw. But it is necessary to have the locations of the flanges and sockets correct. The flanges are bracketed, to prevent them from becoming knocked out of place after being fitted. The size and outline of core may be drawn on the templet, as in Figs. 89 and 91; or a memorandum only need be made thereon. If the latter is done, then less care need be taken with the outlines. The main use of such templets is to fix the exact location of flanges, sockets, &c., and they are preferable to drawings, since they fulfil two functions: They remove all risk of error in taking measurements by rule, the templets being fitted into the places which the castings have to occupy; and they are better understood

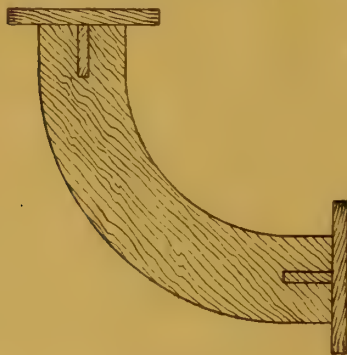


FIG. 90.

in jobbing foundries than sketches would be. The moulder will allow the necessary shrinkage.

Usually patterns would be made for Figs. 88 and 89, the branches being straight; and Figs. 90 and 91 would be made without patterns, the pipes being curved. Of course, it must be remembered that I am speaking only of jobbing or casual work, not of that of a standard and repetitive kind.

Although, however, pattern parts would generally be used in the case of Figs. 88 and 89, that would only hold good in the case of small pipes. Large main-pipes would be made by strickling in loam, precisely as in the case of Figs. 90 and 91. The choice would depend largely on what patterns a jobbing foundry happened to have in stock.

From 8in. to 10in. diameter would be the usual limit. Over these sizes strickling is resorted to.

As it happens sometimes that the necessary strickles, flange, or pattern parts would have to be supplied to a foundry by the customer, in cases in which the stock is scanty, and no pattern-maker employed, I will briefly explain the methods practised. The reader will also understand the reasons for the preparation of certain parts if he clearly sees the methods of their use. Figs. 92 and 93 illustrate the patterns used for the templets in Figs. 88 and 89 respectively. The straight pieces of pipe are fitted and screwed to



FIG. 91.

each other. In Fig. 92, flanges are fitted against or over the pipes—usually the latter. The flanges also are generally “body flanges”—that is, they are fitted over the body of a standard piece of pipe, and then there is no print, except that which is formed by stopping off. By this means the cutting of the pattern to each definite length required is avoided. This is illustrated in detail in Fig. 94. At A a flange B is screwed over a branch piece C, at some distance away from the

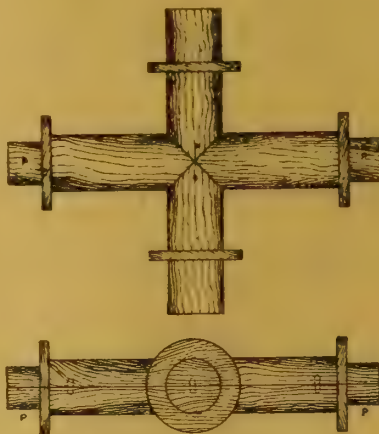


FIG. 92.

end. This is moulded. In the mould a stopping-off piece D, shown at B, is dropped into the impression of the flange, and sand is made good round the print which is nailed to the flange. Into the print impression thus formed, subsequently to the moulding of the pattern, the core E is dropped, seen at C in Fig. 94. It is therefore clear why, in jobbing work of this character, no cutting off the pattern to exact lengths is practised, and why it is not necessary that each flange should have a print against it. In order to illustrate the distinction clearly, I have shown flanges with prints on the main length of pipe in Fig. 92, and body flanges on the branch-pipes. Similarly, when socketed ends are required, it is not usual to turn the socket on the pipe. Iron sockets are kept in stock, hollowed to fit the body of the pattern, and lightened out, and these are screwed on where required. In Fig. 93 I have shown the main portion of the pattern with a wooden socket turned on it, but the branch with

an iron socket screwed on, the position of the latter being therefore adjustable.

When a pipe having curved outlines like the templets, Figs. 90 and 91, is required, and no wooden pattern is made, a pattern is struck up in



FIG. 93.

loam by a very simple and inexpensive process. The only parts required are strickles, a guide iron, and the flanges or sockets, and usually these are all kept in stock in a jobbing foundry. Occasionally it may be necessary for a customer to supply these. In Fig. 95 let A represent half the

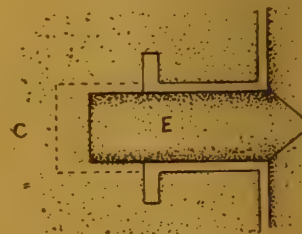
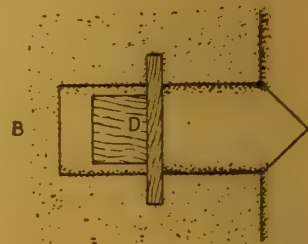
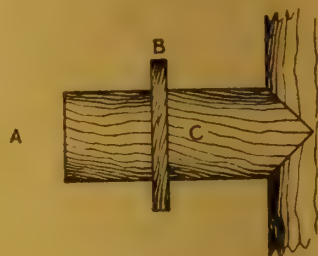


FIG. 94.

diameter of a pipe, and B half the diameter of its core. Then two strickles are required cut to those diameters. C is a guide-iron of from  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. square bar, curved lengthwise to curves which run parallel at a definite distance—say,



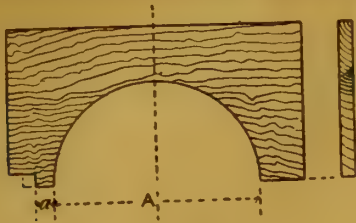


FIG. 96.

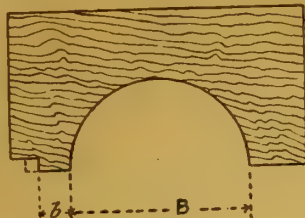


FIG. 97.

from lin. to 1½ in. away from the edge of the pipe required. There are certain distances, *a* and *b*, from the inner edges of the guide-iron to the adjacent outer and inner edges of the casting respectively. Now, it is evident that if two strickles are made, Figs. 96 and 97, cut respectively to the curves *A* and *B*, and if they are shouldered back to distances *a* and *b* corresponding with the distances similarly lettered

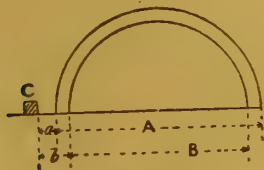


FIG. 95.

in Fig. 95, that half-pipe patterns and half-cores can be struck up in plastic loam by their use. If the guide-iron is bent to a parallel distance away from the edge of any curved pipe, however irregular its form, and the strickles are cut to correspond with that distance, then the iron becomes an exact former by means of which the correct outline of the pipe and its core, and their concentricity, are secured. I think this will be obvious without further explanation. Into the details I need not enter. It is sufficient to say that two halves struck right and left-handed upon suitable grids, when cemented together, form the body of the pattern when the strickle Fig. 96 is used, and of the core when the strickle

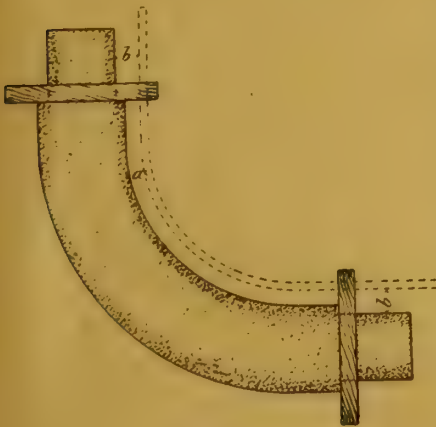


FIG. 98.

Fig. 97 is used. Without going farther into the technique of this class of work, I give in Fig. 98 an illustration of a loam pattern with its wooden flanges, made from the data afforded from the templet in Fig. 90. The location of the guide-iron, by which it is struck up, is shown in dotted outline, and the distances *a* and *b* coincide with the distances *a* and *b* in Figs. 95-97. The study of the foregoing figures will, I think, tell the contractor as much about pipe-work as he would be able to turn to practical account.

a height of something like 400ft. (nearly the altitude of Salisbury spire), with a proportionate diameter (though the loftiest trees have not always the most colossal stems); and trees have repeatedly been measured with a height of 410ft., 420ft., and upwards. The timber is not a strong one as compared with the hardwoods generally; but is extremely fissile, is valuable for many kinds of building and carpentry work, and does not twist in the drying, though it is not considered to stand well for engineering and outside work. It is adapted to several of the uses of the shipbuilder, and particularly to those of the coachbuilder. The timber, however, is apt to split, rend, or twist if used in a green state and subjected to sudden changes of temperature, particularly in outside work. Upon the subject of the artificial seasoning of Australian timbers I shall have something to say hereafter; meanwhile, it need only be added that the average weight in pounds per cubic foot of the *E. amygdalina*, var. *regnans*, is 47.54.

The Woollybutt (*E. longifolia*), though scarcely more than a third-rate timber in New South Wales, is a favourite in Victoria, on account of its durability. Its weight, when dry, is about 68½ lb. per cubic foot. It is plentifully distributed throughout the coastal districts, and attains fair dimensions. The bark is of a dirty-grey colour, and of brittle, fibrous character, at one time thought to be of a woolly texture, whence the vernacular name of the timber. The wood is dark-red in colour, and of the jarrah class (*E. marginata*, which will be dealt with under the head of Western Australia), with a wavy grain, and in appearance is not unlike the red ironbark (*E. sideroxylon*) for which more valuable timber it is sometimes substituted. But, notwithstanding its durability and height, it is deficient both in elasticity and strength, particularly near the heart, though it is of proved value under very trying circumstances as regards exposure. Where its comparative brittleness would not effect its usefulness it may safely be employed for many of the purposes for which ironbark is used; but its most serviceable employment will probably be found eventually to be for wood-paving—a purpose with which brittleness would not interfere.

Swamp Tea-tree (*Melaleuca ericifolia*) is found in all the eastern colonies, but it is most plentiful in Victoria, where it fills many of the swamps of both brackish and fresh water, and also lines innumerable watercourses. It is never a large tree, but, on the contrary, generally small, though it may be seen occasionally 50ft. to 60ft. high. Specimens of this timber were shown in the Victorian Court of the Intercolonial Exhibition of 1866, and employed as it consequently has been since then, it has been found to last extremely well under water. When seasoned it is very hard, and it is excellently adapted for such interior work as rafters, &c.

Narrow-leaved Apple-tree (*Angophora intermedia*) finds its principal home in Gippsland, though it is found in the neighbouring colonies of New South Wales and Tasmania. It is a medium sized tree, of somewhat rapid growth, attaining a height of 80ft. to 100ft., with a diameter of 24in. to 36in. It is both tough and hard, and highly damp-resisting. It is very subject to gum veins, and needs, therefore, careful selection. But when free from that defect, the timber is a valuable one for many purposes, especially for wheelwright's work, and it likewise finds considerable use for flooring-boards.

The White Box (*E. hemiphloia*) and the Victorian Mahogany (or Queensland Blue Gum—*E. botryoides*) have been already described—the former under the head of New South Wales (in the fourth of these articles, p. 482), the latter under the head of Queensland (in the last one, p. 703). It is only necessary, therefore, to add that Victorian mahogany is another of the four colonial timbers recommended by the Victorian Carriage Board for use in the manufacture of

railway carriages, the fourth being the Tasmanian blackwood, which will be dealt with in due course. Specimens of *E. botryoides* from Gippsland, christened "Gippsland mahogany," are spoken of as "a timber of good colour, as strong as blue gum (*E. globulus*), but of less specific gravity."

## IV.—SOUTH AUSTRALIA.

The South Australian hardwoods are mostly of the same species as those of Victoria, and to some extent of Western Australia, though those that are found to any considerable extent are far from numerous. Several of them, however, thrive particularly well in this colony, and possess more valuable properties, perhaps, than the same timbers produced elsewhere; while one of the Eucalypts, the sugar-gum, is, I believe, almost exclusively indigenous, and does not appear to be found in any of the sister colonies, except to some small extent in Western Australia.

Sugar-gum (*E. corynocalyx*) is so named by reason of the cattle eating the foliage in consequence of its sweetish taste, and not on account of any sugar-bearing properties belonging to it (as is often popularly supposed), since it possesses none. It is a handsome tree, attaining a height of from 80ft. to 120ft., and sometimes even 150ft., with a stem diameter of 4ft. or 5ft. near the base. One of its marked characteristics is the brilliant orange yellow of the young bark when the older bark is cast off. The finest quality of timber is found along the Flinders ranges, where it forms with the white box (*E. hemiphloia*) the principal forest tree, growing on the ironstone and sandstone at an elevation generally of from 1,500ft. to 2,000ft. On the granular ironstone and limestone near Port Lincoln this elsewhere striking tree attains but meagre dimensions; but on the sandy creek bottoms of Kangaroo Island it assumes a form admirably adapted for telegraph poles and masts, as well as for piles. The mountain timber is of a peculiarly valuable description, and, by the variety of purposes for which it is suitable, atones in a great measure for the fact, out of the limited range of timbers possessed by South Australia, the sugar gum is the only hardwood peculiar to that colony. It is dense, hard, and very durable, loses but little of its weight in seasoning, and when dry weighs usually from 65lb. to 70lb., and sometimes even more, per cubic foot. Hence it is extensively employed for piles and railway sleepers, and for other engineering work, as well as for wheelwright's work, and for beams and story-posts in buildings. But the wood likewise possesses a pleasant yellowish-brown colour, and often shows a handsome heavy grain—qualities which, combined with its hardness, fit it eminently for use in ornamental parquet flooring and the more substantial forms of decorative furniture, while the best selected specimens furnish veneers of exceptional beauty.

There exists, according to Mr. Walter Gill, another hardwood peculiar to South Australia—viz., a "white, swampy gum," very serviceable for railway sleepers and similar purposes, which he calls *E. Gunnii*. But according to Mr. Perrin, the Victorian Conservator of Forests, who himself formerly held office under the South Australian Government, this is simply another name for the *E. leucosylon*, which, although called in the colony "South Australian blue gum," and often thought to be ironbark and the same as *E. sideroxylon*, is in reality a gum with a white wood, and not an ironbark at all. The confusion with reference to these woods—a confusion which still exists widely throughout the colonies—seems to have originated in this way. Many years ago, the botanist, Allan Cunningham, called an ironbark with red wood *E. sideroxylon*. Long afterwards Baron von Müller described a gum-tree under the name of *E. leucosylon*, though there is nothing of the ironbark about this tree, and its wood is white (as the Greek name signifies). The fruits, however, of the two trees are indistinguishable, and the Baron (omitting to look into the matters of bark and wood) pronounced them to be identical, and proposed to supersede the old (and rightful) name of *sideroxylon* (Anglicè, "ironwood") by *leucosylon*. The confusion which existed for so many years has at length been rectified among the more advanced of the scientists, and the *E. leucosylon* is now properly known as "White Gum," but the error, like many another one, is very slow of general dissipation. At all events, the timber is used chiefly for sleepers; but the trees are small, and do not average much over 30ft. in height, and an average "cut" of two (or occasionally three) 7ft. lengths

## THE TIMBERS OF AUSTRALASIA.—VII

THE HARDWOODS: III.—VICTORIA (concluded).

THE true Mountain Ash, or "Giant Eucalypt," of Victoria (*E. amygdalina*), frequently called (as are several other of the Eucalypts) "peppermint," is one of the most remarkable trees in the whole creation. It habitually reaches



is about the usual run of them. The tree cuts up well at the bench, but is very prone to become hollow or pipy. The wood is heavy and close-grained, and stands in water fairly well, but is inferior to the true Victorian and Tasmanian blue gum (*E. globulus*), which likewise thrives in South Australia, as does equally the Murray red gum (*E. rostrata*). It may here be mentioned that the sugar and blue gums and the box of South Australia are preferred for piles by local contractors before any of the more famous West Australian timbers, which, they assert, do not stand the fall of the "monkey," even when they are bound with iron, as well as the timbers of this colony do without being bound, the West Australian woods being more liable to split under the pile-driver.

The Manna-gum (*E. viminalis*), though it grows in several of the sister colonies, thrives wonderfully in Tasmania, and has been introduced into Victoria with great success by Mr. Perrin, seems to attain its best condition and qualities in South Australia. It is one of the handsomest of all the Eucalypts, and in its young state makes a fine avenue tree, though in late years it becomes extremely tall, growing 300ft. high, with a straight, clean bole up to 60ft. in height, while trees with a stem diameter of 15ft. have been felled in Wirrabara Forest. The tree, which derives its vernacular name from the white saccharine exudation often found on its twigs, has beautiful dark green leaves, which shine on the upper surface, and the foliage, when stirred by a passing breeze, trembles like that of "the light quivering aspen." The timber, which is of a brick-red colour, light and dark, is very solid, hard, and dense in grain, and very heavy, though at the same time thoroughly fissile; it is usually free from gum-wells and other faults, but the trees, when over-matured, are liable to become pipy. The manna-gum is a particularly hardy tree, and in Wirrabara Forest, on the Flinders Range, it grows to its largest size on the limestone rocks or reefs, which form the outcrop of this range. For various building purposes it is a useful timber, while for all kinds of heavy railway work, such as sleepers, and for bridges, it is invaluable in consequence of its exceptional weather-resisting properties, and its great durability underground. Indeed, this and the Murray red gum are the chief sleeper trees the colony possesses; though the white box (*E. hemiphloia*) is another fine sleeper timber, which, common as it is to several of the sister colonies, thrives particularly well in South Australia, owing to the exceedingly dry climate.

The Black Box (*E. largiflorens*) attains a maximum height of 120ft., with a diameter of 24in. to 36in. The wood is dark brown-red in colour, excessively hard, tough, and durable, and very lasting underground; posts have been dug up which have been perfectly sound after 30 years of service. The trunks of the trees are not unfrequently hollow and decayed at heart, but the sound timber is more easily worked than the iron barks or most of the box-trees. It is satisfactorily employed for railway sleepers, and answers well for the coarser kind of building work, as well as for the rougher purposes of the coachbuilder, the millwright, and the wheelwright.

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## NOTES ON DOMESTIC DRAINAGE.—XVI.

### URINALS.

AMONGST the various sanitary appliances that may be required for general domestic purposes, this class of convenience is probably the most difficult to arrange, so that it may remain permanently hygienic, and inodorous when in constant use. This is due in a great measure to the chemical composition of urine itself. Urine is a compound of urea, uric acid, and other organic and inorganic matters in combination with water. The urea present in urine rapidly decomposes, especially if any slight degree of heat be present. During this process of decomposition large quantities of ammonia are given off, the pungent and unpleasant odour from which frequently permeates the whole of the room in which the urinal is situated. Uric acid is but slightly soluble, and has a tendency to adhere to any surface with which it comes in contact, where it eventually decomposes if not immediately removed.

Urinals for domestic purposes are usually situated in some confined and insufficiently ventilated apartment, having a much warmer atmosphere than the external air. The most

favourable surroundings are accordingly afforded for the rapid decomposition of the urine unless it is at once effectually carried away. No description of fitment can, therefore, be considered as likely to be permanently satisfactory unless an ample supply of water with a good flush is provided, so as to quickly and thoroughly remove all traces of urine immediately after its deposition.

Sometimes a water-closet of the wash-down pedestal type with hinged seat is designed to serve the purpose of a urinal in places where such

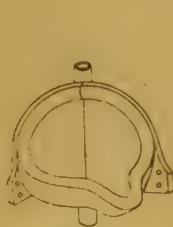


FIG. 82.



FIG. 81.

a convenience would only occasionally be required; but such an arrangement is not suitable for general or constant use. Considered as a urinal fitment, the basin of the w.c. is placed at too low a level for the purpose, and occasions a certain amount of splashing over and around the closet. Any careless droppings of urine are also deposited on the floor, where they are usually allowed to remain and decompose, giving rise to that obnoxious smell at present characteristic of far too many urinal apartments.

To provide an efficient and permanently satisfactory urinal, it is desirable that the following conditions should be complied with as far as possible—viz.:

1. The apartment in which it is situated should be thoroughly well lighted and ventilated; the floor and walls—or, at least, those portions immediately contiguous to the urinal—being of some smooth, non-absorbent material.
2. The amount of soiling surface over which

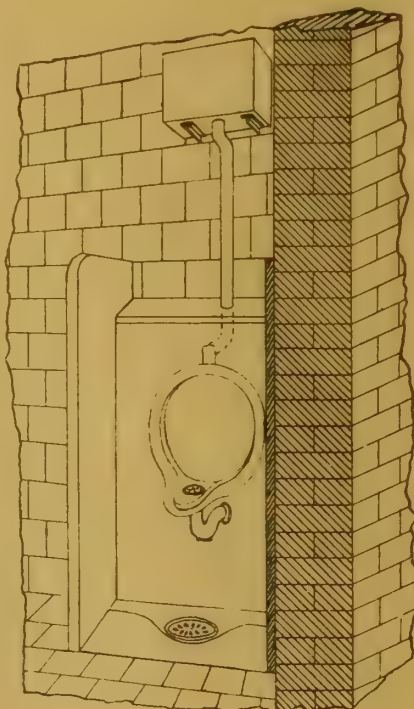


FIG. 83.

the urine may be spread should be as small as possible consistent with convenience, and should be entirely free from any angles or corners which might tend to retain deposits of urine or dirt.

3. Every portion of the soiling surface of the urinal fitment should be self-cleansing, smooth, impervious, and not readily acted upon by uric or other acids.

4. An adequate supply of water should be available for the complete removal of all traces of urine on every occasion that the appliance is used.

Urinals may be broadly divided into what are known as stall, trough, and basin urinals.

For private establishments, &c., where it is desirable or necessary that the urinal shall be

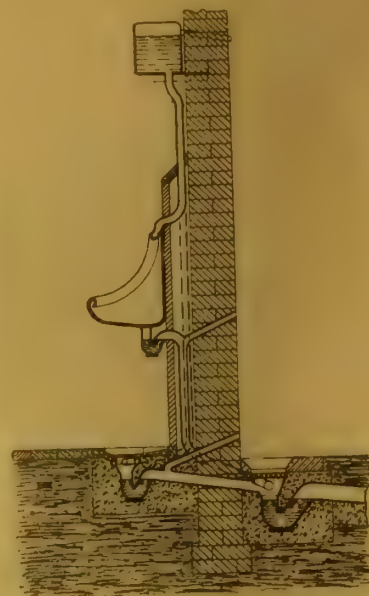


FIG. 84.

fixed within the dwelling, it is considered that the most satisfactory appliance is afforded by a good type of urinal basin, with a properly constructed foot-plate or base under. The basin should be of glazed porcelain, with lip and flushing-rim, the back being angular or flat, according to the position in which it is to be placed. Fig. 81 is a sketch of a flat-back, lipped urinal basin, and

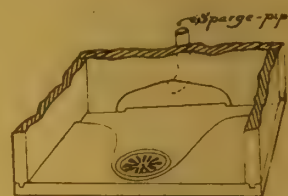


FIG. 85.

Fig. 82 an angular-lipped basin, both being provided with flushing rims.

The advantage of a urinal basin over that of a stall or trough urinal is that the discharge of urine is concentrated at one definite point, instead of being spread over a large surface area. In stall urinals, the whole of the floor, sides, and

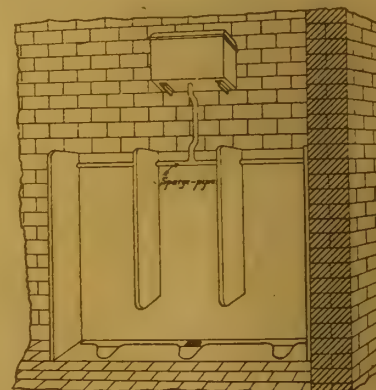


FIG. 86.

back of the compartment is in a more or less wet, splashed, and uninviting condition. This creates a desire on the part of the user to avoid entering the compartment, so that the discharge is frequently made at some distance from the fitment, the area of the soiled surface being consequently still further enlarged.

Figs. 83 and 84 show the elevation and section



of a urinal fitted with a white glazed porcelain flat-back, lipped basin, with flushing rim and back outlet. The foot-plate or floor of the urinal compartment is dished to proper falls, so that all drippings may enter the glazed earthenware flushing-rim gully-trap. Both the drip-gully and urinal basin are trapped, and discharge into a trapped gully outside. An alternative arrangement of base-plate is shown in Fig. 85, having a perforated brass sparge-pipe and shield at bottom, together with an ordinary trapped gully. Concerning the water supply, the most satisfactory results are obtained when it is so arranged that a constant flow of water is given to the urinal basin, together with a frequent automatic flush to the drip-gully or sparge-pipe at the bottom of the base-plate. Many water companies will not, however, permit a constant supply of water to be given, in which case the basin, and also the drip-gully, should be connected with an automatic flushing tank discharging at frequent intervals, or arrangements may be made whereby they may be flushed after use by pulling the handle of a water-waste preventing cistern. The proper flushing of the urinal under the latter arrangement is apt to be neglected by the person using the fitment, as the pulling of the handle after use is frequently omitted. Urinals which are flushed by means of a treadle-action platform are objectionable, as the apparatus is liable to become fouled and evil-smelling.

The back and sides of the urinal compartment may be of marble, glazed porcelain, or enamelled slate, and to insure absolute cleanliness and freedom from smell, it is advisable that the entire compartment be well washed and scrubbed down once a day.

Where subject to rough or unfair usage, the

wanting in self-cleansing action. They are comparatively cheap in first cost, and being generally placed in airy and freely ventilated situations, the surrounding atmosphere exercises a constantly

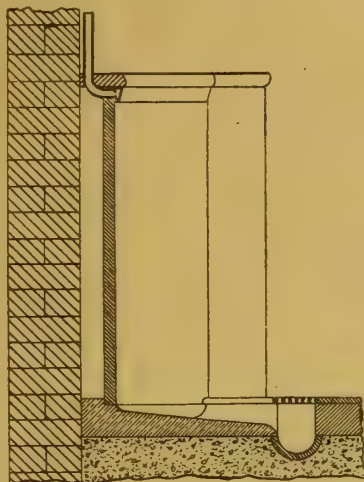


Fig. 88.

purifying effect upon them, thus remedying in some measure their defective construction. A much improved form of stall urinal is shown in Fig. 87, together with a cross-section through the same. (See Fig. 88.) The stalls are formed with a rounded or semicircular back, the sides and

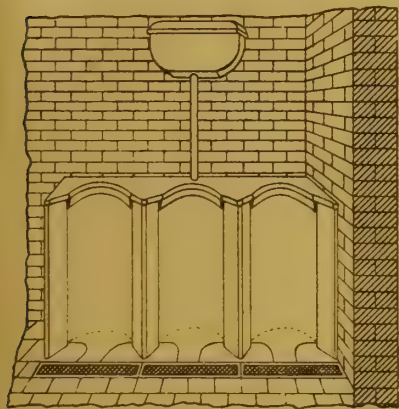


Fig. 87.

urinal basins are sometimes made of porcelain enamelled iron; but for ordinary purposes they are inferior to glazed porcelain.

What are known as "self-flushing" basin urinals are sometimes fixed. In this type of urinal the discharge of urine into the basin starts a siphonic water-waste preventer, so that the basin is flushed on every occasion that it is used.

Where a range of urinal basins is required, the slate or marble divisions should be spaced 2ft. apart, and supported on cast-iron brackets fixed about 2ft. 3in. above the floor-level, so that the lower portion of the whole range may be easily cleaned from end to end. They should project not more than 15in., as such a width will be found quite sufficient for decency, whilst insuring that the user shall stand close to the basin during the discharge.

For large institutions, where the utmost economy of construction and maintenance is a great consideration, "stall" urinals are used. They are placed in an airy inclosure at some distance from the main buildings. Fig. 86 shows a range of urinals of this character, having slate divisions and backs, dished foot-plates, and continuous channel discharging over a trapped gully. A horizontal perforated copper pipe—known as a "sparge" pipe—runs the whole length of the range, the water passing through the perforations in a continuous stream, so as to cleanse the back of the stalls. For sanitary efficiency the soiling surface is much too large, whilst the sharp angles between the back and divisions are objectionable, as they cannot be easily cleaned, and so tend to collect deposits of the salts of urine at those points. The surfaces of the divisions also become greatly spashed with urinary matters, and are totally

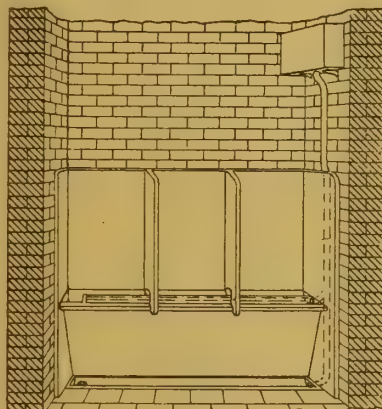


Fig. 89.

floor of each compartment draining into a channel in front covered with a perforated grating. On taking up the grating the whole length of the channel can be swept and cleaned. Although the soiling surface still remains comparatively large, there are no angles or corners to retain urine or dirt, whilst the whole of the compartment is well

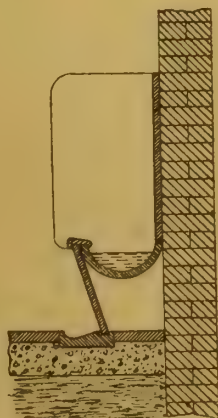


Fig. 90.

flushed with a sparge-pipe curved to the shape of the back.

A range of trough urinals is shown in Fig. 89, of which Fig. 90 is a section. The urine is discharged into a trough full of water, which is

retained within the trough by means of a weir near the outlet. The contents of the trough are periodically driven out and refilled with clean water by an automatic flushing tank. As the urine is not immediately removed, the surfaces of the trough gradually become coated with deposits from the urine, whilst the front of the range is liable to be fouled from careless usage.

As already stated, it is desirable that the soiling surfaces of all urinals should have a constant stream of water playing upon them, so as to immediately remove the urine and prevent the formation of urinary deposits thereon. Few water companies will, however, permit such an arrangement, and insist upon a water-waste preventing cistern or valve being used. This would meet all sanitary requirements if carried out in its integrity; but unfortunately, where the flushing of the urinal is left to the person using the convenience, it frequently occurs that the user, either through carelessness or haste, omits to discharge the water-waste preventer, and the urinal consequently becomes furred with deposits, whilst the atmosphere is tainted with the ammoniacal and other offensive odours arising from the decomposing urine. It is generally more satisfactory to adopt some type of automatic flushing cistern, arranged to discharge at short intervals, so as to insure the appliance receiving an independent and periodical flush. A one-gallon water-waste preventer will suffice for a single urinal if the discharge is made at frequent intervals.

#### BOOKS RECEIVED.

*Tabulated Weights of Angle, Tee, and Bulk Iron and Steel*, by CHAS. H. JORDAN, M.I.N.A., &c.; 5th edition, revised (London: E. and F. N. Spon, Strand).—The fifth edition of this useful little pocket-book contains a large number of new tables relating to the various sections of iron and steel now on the market. The approved standards of sizes and forms of bulbs to bulk-plates, beams, and bulb angles approved by Lloyd's Register of Shipping and used by ship-builders have been calculated and embraced in this edition, also special tables of sectional areas and weights of tee-bars. These sections have been illustrated by diagrams, which show the bases on which the tables have been calculated. The tables of sectional areas and weights of material are very minute, and give the thicknesses to twentieths, fortieths, and thirty-seconds of an inch; and the miscellaneous data and tables will be found of value to the draughtsman and naval architect. —*Journal of the Western Society of Engineers* (Chicago).—The first number of this new journal contains several papers and discussions. The first, by Mr. A. V. Powell, M.W.S.E., "Notes on Dry Docks of the Great Lakes," gives some instructive particulars of the subject, illustrated by photo-tints and diagrams. The author describes the dry dock of the Chicago Shipbuilding Company formed during the summer of 1894, about a mile from Lake Michigan. Another paper of interest is by Clement F. Street, on "Oriental Railways." The author's paper is illustrated by views of the Suez Canal, the Bombay Station on the Great Indian Peninsula Railway, having 1,498 miles of track; the station is probably the most palatial-looking in the world externally, with its dome and cupolas, though very disappointing in the interior. Other views are given. The other papers are of special engineering interest. In the "topical discussions," an elaborate paper on "Cement and its Uses," by Alfred Noble, M.W.S.E., with tables and other data, is printed. The supplement of profiles and plates which accompany the journal illustrate the paper on "Lakes and Atlantic Waterway," compiled by the committee of the society. —*Lincoln's Inn Fields and the Localities Adjacent*, by CHARLES WILLIAM HECKETHORN (London: Elliot Stock), is a careful and interesting record of a London district rich in historical and topographical associations. There are numerous illustrations. We are surprised at the author's curious stricture on page 52 on a recent sensible remark of a contemporary. *The Builder* said five years ago, and we said the same thing long before, that the south side of New-square ought to be demolished, and the result would be a fine open space with the Law Courts at its southern end. Mr. Heckethorn thinks it quite enough to remark that the quietness of the people in New-square would be invaded. As if that ought to stand in the way of so desirable a Metropolitan improvement! —*The Sewerage Engineer's Note-Book*, by ALBERT



WOLLISTON, Assoc. M. Inst. C.E. (London: The St. Bride's Press, Limited, Bride-lane, Fleet-Street).—This is a collection of notes and data originally made by the author for his own use, and is reprinted from *The Surveyor and Municipal and County Engineer*. For the engineer and student engaged in sewerage works, this little book will serve admirably as a manual, as it is interleaved for the reader's own memoranda—a very excellent plan. The general formulae for circular and egg-shaped sewers are illustrated by examples worked out. Standard sections of sewers, with their areas, perimeters, hydraulic mean depth, depth of flow, are very useful; so also are the chapters on sewer discharges, the diagram of discharges and velocity, relation between rainfall and discharge. Several useful tables on pipe sewers, circular sewers, egg-shaped sewers with their areas, H.M.D., and multipliers for velocity and discharge, form an appendix to this very acceptable little guide, that cannot fail to be of use to all who wish to shorten laborious calculations, and references to other matters and formulae.—*The Gentleman's Magazine Library*, edited by GEORGE LAURENCE GOMME, F.S.A. (London: Eliot Stock), Part VII., carries down the topographical collection to Monmouthshire, the first county dealt with being Leicestershire, which is full of historical associations, and the home of two ancient families, the Hastings and the Manners. The notes are less important than in the other counties already treated. Several ancient customs, notably those at Hinckley on Easter and Whit-Monday, are of interest, and a few old churches and relics of this county are described. Lincolnshire is of more archaeological interest. The notes on coats-of-arms on the public buildings of Stamford and the buildings themselves are of value, as are one or two contributions on domestic architecture. Middlesex is also full of material for archaeological research, and a feature that has largely disappeared is the culture of mulberry-trees, cedars, and pines, which were at one time cultivated with success. Hammersmith was, it is said, noted for its fine cedar-trees, as well as for its mulberry-trees, which latter the editor, Mr. Gomme, particularly notices, a splendid example of which, he says, was to be found in his own family house at Hammersmith. This volume adds another to this interesting series of the topography of England, and is well printed.—*The Sheet-Metal Worker's Instructor*, by REuben HENRY WARR, tinplate worker; new edition, revised and enlarged by Joseph G. Horner, A.M.I.M.E. (London: Crosby Lockwood and Son).—Mr. Horner has remodelled the first edition, and has introduced those elementary principles of geometry which are necessary in pattern-making. He has given a selection of those problems in geometry and the development of solids, or rather the envelopes of solids, which are of special value. The president editor has also treated of projection and mensuration, of the metals and their alloys, and has added chapters on the operations of flattening and raising of joints and seams, of brazing and soldering, tools, &c. On the whole, this edition will be found more suitable to be put into the hands of the youthful pupil who is learning the crafts of the zinc, sheet-iron, copper, and tin-plate trades. It is more elementary and comprehensive, and by showing how all these crafts are based on geometrical principles, a better grasp of them can be obtained.—*The Digest of Physical Tests*, edited by H. M. NORRIS (Philadelphia: Fred. A. Richlé). Vol. I. No. 2 contains articles on "Scientific Timber Testing," by B. E. Fernow; "Systematic Inspection of Material," by L. S. Randolph; "Paving Bricks," by F. Paul Anderson; "Steel Castings," by C. H. Benjamin; and other instructive matter on physical tests. The illustrations of fractures of firebricks and the typography are excellent. A good portrait of Dr. R. H. Thurston, of Cornell University, is given as a frontispiece.—*Illustrated Europe*. We have received from the publishers, Messrs. Orell, Füssli, and Co., of Zurich, a batch of their admirably arranged Continental tourists' guides. Part 3 describes the Arth-Rigi cogwheel railway from the shores of Lake Zug to the summit of the Rigi; Part 13, by J. Weber, is devoted to the town of Lucerne; Part 34 describes the Burgenstock Hill and its elevated railway; Parts 53-4 illustrate the rail journey from Paris to Berne, via Dijon and Pontarlier; and Parts 55-6 expatiate on the beauties of the Lake of the Four Cantons. The several numbers, published at 6d. each, are graphically written, and are translated

into readable English, heights and distances being given in feet and miles. They are profusely illustrated with woodcuts and reliable maps, while the paper covers and convenient size (7in. by 5in.) make them the handiest work of the kind for the traveller's pocket and hourly use.—*Alphabets: a Manual of Lettering for the Use of Students*, by EDWARD F. STRANGE. Second Edition, with 200 illustrations (London: George Bell and Son).—The second edition of this useful manual of lettering will be found of much service to all architects, draughtsmen, designers, and students. Mr. Strange has collected his types and characters from a large variety of sources, and as a palaeographic textbook the work will be found interesting and instructive. The ordinary draughtsman has often but a very imperfect historical knowledge of the subject. The author has suggested methods, and the principles he formulates are worthy of attention. The illustrations, culled from a great variety of examples, are well chosen, some from block books, others from title-pages, capitals from MSS., dedicatory inscriptions, incised brasses, &c., and the book begins with Roman lettering and its derivations, and traces the development of the art from the Middle Ages to the present time. We reviewed this book in detail, and gave a few illustrations from it in our issue for May 31, 1895.—*Cottages and Country Buildings*, by THOMAS W. CUTLER, F.R.I.B.A., &c. (London: Horace Cox, Bream's Buildings), is a collection of original designs which the author has carried out in various parts of the country. Some of them have been exhibited at the Royal Academy and other galleries. Looking over the 43 plates of designs, with their descriptions for cottages, single and in pairs, and groups, lodges, bailiff's cottages, entrance lodges, village shops, stables, farm and country houses for different purposes, we are agreeably impressed. The usual kind of spurious design-making which one sees in books of design is absent; we see in most cases structures honestly designed, and the exteriors the simple outcomes of plan. The usual fussy kind of detail, over-gabled attempts to produce picturesque, generally an affectation of it, have done much harm to books of this nature. Mr. Cutler has shown that single and double, or grouped cottages, can be made both simple and pleasing by the proper use and treatment of the local materials, and the plans are suggestive. The designs for a lych-gate and lodge to cemetery in Warwickshire are characteristic and simple, and some of the designs for small country houses are picturesquely handled, as in plates 23, 24, 25. A cheap and timber-framed mission church is shown, but less characteristic in style. The homestead, plate 30, of red brick and timber and plaster-work, is sensibly treated and pleasing, and the design for a seaside cottage is simple and unpretending, yet appropriate. The description and cost in each is given, and the designs are generally well drawn and artistically shaded. They are generally of brick, tile, and half-timbered, such as we find in Surrey and Warwickshire; a few are stone and tile-hung, but these are variations which Mr. Cutler has adapted to the locality.—*Handy General Earthwork Tables*, by J. H. WATSON BUCK, M. Inst. C.E. (London: Crosby Lockwood and Son), is a very useful and handy set of tables mounted on the insides of a stiff pair of covers. Everyone who has had to calculate the cubical contents of railway and other cuttings and embankments by the usual rules and the irksome and laborious process, will find Mr. Watson Buck's tables exceedingly convenient. To find the total contents of, say, a cutting one chain in length, it is only necessary to find out the depth of cutting in one column, and to multiply the number found in the centre column by the width in feet. Next multiply the number in the third column by a multiplier for the proper slopes, which multipliers are given, and add together the two results. The tables are clearly printed in feet and fourths, the heights column beginning at a quarter of a foot, .25, and proceeding by quarters to 80ft. The multipliers for slopes are from  $\frac{1}{2}$  to 1 to 3 to 1, so that every angle usually met with is given.—*The Process Year-Book* (London: Bemrose and Co., Upper Baker-street, Clerkenwell), is a valuable review, illustrating, by examples, all the modern photo-mechanical processes of reproduction, including those known as autotypes, half-tones, zincographs, photo-lithos, photogravures, mercurographs, heliogravures, chromotypes, photoglyphies, collotypes, phototypes, carbon-types, and all the other variations of printing for which mongrel-Greek

designations have been invented. In his introductory remarks, the editor observes that great advances have been made during the year in the making and printing of half-tone blocks. Indeed, the particular branches in which progress has been made are half-tone and three-colour work.—*The Year-Book of Photography* (London: 22, Fumival-street, E.C.), also freely illustrated, contains a number of helpful articles on the craft by practical photographers, and appeals to a wider class of readers by a series of papers in "The Amateur's Holiday Guide," obviously based on personal experience.—*Electric Lighting and Power Distribution*, by W. PERREN MAYCOCK, M.I.E.E. Third Edition, enlarged, Vol. I. (London: Whittaker and Co., Paternoster-square).—Mr. Perren Maycock is an authority on electric lighting and engineering, and this is the third edition of a very useful elementary manual, well adapted for students preparing for the preliminary and ordinary grade examinations of the City and Guilds of London Institute. It contains well selected questions and exercises, and is well illustrated. In this edition, which has been rewritten, there is a chapter on electric-bell fitting, which will be found useful, and another on the magnetisation of iron. The author has made his manual elementary by defining the different kinds of force, mass and weight, units, and other elements of physical science which must be understood by the student who desires to become a proficient electrical engineer. The author gives concise definitions of "current," "potential," "lines of force," magnetic effects of a current. The diagrams are clear, and every type of electric magnet, dynamos, and electrical instruments for measuring resistance, voltmeters, &c., is illustrated. At the end of each chapter questions are added referring to the paragraphs, and these questions have been selected from those given for several years past.—*Theatre Panics and their Cure*, by AUCHRALD YOUNG, Edinburgh. (London: B. T. Batsford).—This almost hackneyed subject is discussed by the author of this little pamphlet, who advocates a system of outer balconies with sufficient means of descent at every level. We have heard of the same suggestion before. No doubt it is quite true if the audience could be assured of their easy escape, fewer groundless panics would take place. The outside balcony it is thought would guarantee this assurance; but we are afraid there would be the same hurry to escape, and unless the staircases to the street level were numerous and spacious there would be the same danger. Mr. Young has, with the assistance of his coadjutor, Mr. Thomas T. Paterson, architect, shown, by plans and sections, how his scheme can be worked out. A complete system of outside balconies, applied to both the stage and auditorium ends of the building, is shown in the photo-litho. reproductions of the plans. Mr. Paterson's notes on the designs submitted will be of interest to all promoters and managers, and the plans, section, and elevations fully embody the author's ideas. We may add the staircases form external square towers to the balconies, three on each side, and these could be made features in the design. The suggestion is, at least, worth attention.—*Society of Engineers: Transactions for 1895*. (London: E. and F. N. Spon, Strand).—The volume before us contains, in addition to the address of the president, William George Peirce, papers on "Light Railways and Tramways," on "Portland Cement: its Testing, Uses, and Abuses," by David B. Butler; "Street Subways for Large Towns," by Charles Mason; "Safety Appliances for Elevators," by Hubert W. Umney; "Percolation Gauges," by Reginald Empson Middleton; "The Effects of Strain on Railway Axles," by Thos. Andrews; "Ventilation and Warming," by William T. Sugg. Several plates and tables illustrate the papers, and there is a general index.

The memory of the late Colonel J. T. North is to be perpetuated by the placing of a monument in Eltham parish church.

The action of "Battersea and others v. The Commissioners of Sewers" was heard last week before Mr. Justice North in the Chancery Division. The plaintiffs, Lord Battersea and others, the trustees of Weavers' Hall, sought an injunction restraining the defendants from erecting a building so as to obstruct the ancient lights of the hall. After some discussion the case was settled, the defendants consenting to an injunction against them, by which the ancient lights of the plaintiffs, as enjoyed by them before the pulling down of a building 14ft. high, were preserved.



## CONTENTS.

More Questions Concerning Contracts	771
Architects' Critics	772
Provincial Affiliation	773
Architecture at the Salons of the Champ de Mars and Champs Elysées	773
Steel Frame Construction for Churches	774
Designing of Steel Bridges, Theoretical and Practical.	776
—XXX—	
Cast-Iron in Builder's and Contractor's Work.	777
—XXIV—	
The Timbers of Australasia.—VII.	779
Notes on Domestic Drainage.—XVI.	780
Books Received	781
THE BUILDING NEWS DIRECTORY	1x.
Our Illustrations	783
Mutual Life Assurance Society, Johannesburg	784
Architectural and Archaeological Societies	784
Building Intelligence	802
French Carving of the 16th Century	803
Angouleme and Albi Cathedrals	803
Obituary	804
Engineering Notes	804
Competitions	805
Correspondence	805
Legal	805
Legal Intelligence	806
Statues, Memorials, &c.	806
Water Supply and Sanitary Matters	807
Our Office Table	807
Meetings for the Ensuing Week	808
Trade News	808
Tenders	809

## ILLUSTRATIONS.

MERCERS' HALL.—CATHEDRALS OF ALBI AND ANGOULEME.  
 —TECHNICAL AND ART SCHOOLS, LEICESTER.—PANMURE ARMS HOTEL, EDZELL.—MUNICIPAL BUILDINGS, KING'S LYNN.—THREE PHASES OF XVI. CENTURY FRENCH CARVING.—STEEL FRAME CONSTRUCTION FOR CHURCHES.  
 —MUTUAL LIFE ASSURANCE SOCIETY, JOHANNESBURG.

## Our Illustrations.

CITY GUILDS.—XIX.: THE MERCERS' HALL DRAWING ROOMS.

We illustrated the grand staircase of this leading Company's hall on Nov. 18, 1895, when we gave some particulars of the history of the guild. We now illustrate the drawing-rooms, which are sumptuously furnished and overlook Cheapside. The work was designed and executed under the supervision of the late Mr. J. G. Grace, assisted by his son, Mr. J. Diblee Grace.

ANGOULEME AND ALBI CATHEDRALS.

(See article on page 803.)

LEICESTER: MUNICIPAL TECHNICAL AND ART SCHOOL.

In the early part of last year, the town council decided upon the erection of a technical and art school in the Newarke, in accordance with plans prepared by Messrs. Everard and Pick, local architects. The total cost of the building was estimated at £25,000, which, together with the sum paid for the site, will bring the total outlay up to £32,000. The work is now in course of erection. In the first place, it might be said that the site is an excellent one for the purposes required. It contains an area of 6,027sq.yds., has good frontages to the four surrounding streets, is centrally situated, and is within easy distances of the railway stations. The principal or north-east frontage of the building will face the Magazine-square. The advantage of this position is that in consequence of the open space in front it will insure for all time excellent lighting for the whole of the various rooms. The new building will have a frontage of 215ft., and will be four stories high. The two lower floors will be devoted to the teaching of technical, commercial, and science subjects, and the two upper floors as a school of art. The architecture of the building will be treated in a free Renaissance style. The lower ground floor will be given up chiefly to the staple trades of the town. Two large rooms will be provided for hosiery workshops, and the boot and shoe industry will be similarly provided for. The dye-house will occupy a position adjacent to the hosiery department. Two other large rooms will be provided on this floor for the teaching of trade subjects as necessity demands, whilst excellent accommodation will be secured for the comfort of students attending the classes. All the rooms on this floor will be 15ft. clear height, and will be given a clean and neat appearance by glazed brick dados. The ground floor will be occupied by six classrooms of various sizes, and two lecture-rooms, all of which will be available for the teaching of technical, commercial, and science subjects. The

accommodation here again will be excellent, and the rooms will be as light as it is possible for them to be. The principal entrance to the building will lead on to this floor. This entrance, which will be 11ft. wide, will give access to a central hall 24ft. by 20ft., from which the main staircase will be approached. Here also will be located a room for the head master of the technical and science department, and on the other side will be the secretary's office. An important feature about the arrangement of this floor is that the corridors leading to the several classrooms have been made wide enough to facilitate their being used for the purpose of exhibiting objects in connection with the various subjects taught. The two upper floors will be devoted to the teaching of art, the lower to the teaching of elementary subjects, and the upper to the advanced. The elementary room, which will be 50ft. by 27ft., will be placed in the centre of the building. Close to will be the head master's business room, in which fittings will be arranged for the proper storing of the returned works from South Kensington. The assistant art masters will also be provided with a room on this floor, in which the finished works of the students will be kept. There will be an architectural room, and at the south angle the art lecture-room, 50ft. by 26ft., will be placed. The floor will gradually rise, in order to give every student a perfectly unobstructed view of the models or lecturer's blackboard, as the case may be. At the north-west end of the building will be arranged three rooms for the modelling department, all of which will have a glazed brick dado 5ft. high. The casting-room will be adjacent, and in close proximity to the lift and direct communication with the clay-store, which is in the basement. The second floor will be devoted to the advanced work of the art school. There will be an antique room, 50ft. by 27ft. and 20ft. high, in the centre of the building, and arranged so that there will be three divisions by curtains, each space having a large single window well above the floor. The light-and-shade room will be 52ft. by 22ft., and will be divided and lighted in a similar manner to the antique-room. The painting-room will be situated at the north-west angle of the building. The carving and repoussé-room will be hard by, and also a room for instruction in art as applied to needlework. Beyond the antique-room will come the art masters' workroom. The lift-room will be lighted by a large single window, and heating coils will be placed on both sides of the rooms, in order to assist in obtaining a variety of light and shade upon the models. The design-room will be at the south-east corner of the building. A short flight of stairs from this floor will lead to a space, which has been planned so that it can readily be utilised for the purposes of a conservatory. The corridors of the art school will be the same width as those on the lower floor, and will be utilised for exhibiting the work of the students. We understand that the South Kensington authorities have already promised to send down a good variety of objects for exhibition in this manner.

## PANMURE ARMS HOTEL, EDZELL.

This building is now in course of erection in Edzell, the centre of a very popular tourist and sporting district. The present hotel is a plain two-story building, and it has been utilised as far as possible in the new scheme. When completed, the hotel, which has been designed especially to suit the tourist and sporting class, will contain a large dining-room, two drawing-rooms, smoke-room, writing-room, billiard-room, four parlours, 40 bedrooms, two dressing-rooms, three bath-rooms, three lavatories with w.c.'s, taproom, bar, restaurant and tea-room, private apartments, and the usual kitchen and servants' accommodation. At the back there will be stabling for 25 horses, with lofts, sheds, coach-houses, harness-room, and ostler's-house. Externally the building will be faced with harling of a warm buff colour, and the roofs will be covered with red tiles. The building will be lighted throughout by electricity. Mr. T. Martin Cappon, F.S.A.Scot., of Dundee, is the architect.

## THE NEW MUNICIPAL BUILDINGS, KING'S LYNN.

The design herewith illustrated by Messrs. Philip Tree and Ivor Price obtained the first premium in the competition decided in 1894, for providing the much-needed municipal accommodation for the town of Lynn. The plans show the nature of this accommodation. The four grotesques at the angles of turret and the entrance-

gates are executed in hammered aluminium, polished. The large archway to the right of the new work is the approach to the fire-brigade station in the rear. One of the conditions of the competition was that the new buildings should, as far as possible, accord in outline and feeling with the work of earlier centuries to which they are attached, and with which they range. The whole line of buildings as completed is shown in the view. The older work consists of the hall of the Trinity Guild and a porch containing a staircase to it. The records of the Guild of the Holy Trinity of Lynn are preserved in the muniment room of the Corporation, which is exceedingly rich in manuscripts. The hall was commenced about the Feast of the Holy Trinity in the 9th year of Henry V., 1421, and was two years in building. The old hall was destroyed by fire on January 23, 1421. The oak of the timber roof came from Bacton, in Suffolk, and William Kerver, of Castleacre, did the work. The name "Kerver" somewhat disguises his name of "carver"—the substitution of "e" for "a" being still used in East Anglia. The present Guildhall of Lynn has been shortened at its northern end to form a continuation of the Georgian ballroom behind it; but the crypt remains entire. The front of the hall is built in the square diaper pattern of stone and flint alternately, which is a common form of work in Norfolk. In this front is a 15th-century window, and under it, what are now two pointed windows, were the doors entering into the crypt, and now blocked half-way up. Beside it and between the hall and the new buildings is the Elizabethan porch.

## CHIPS.

The Aberdeen School Board have resolved to proceed with the erection of new offices in Union-terrace. The building will have a frontage of 50ft. to the terrace. It will be designed in the Italian Renaissance style by Mr. A. Marshall Mackenzie, A.R.S.A. The estimated cost of the building is £5,000.

The will of Mr. John Clutton, late head of the firm of Messrs. Clutton, Whitehall-place, surveyors to the Crown, Ecclesiastical Commissioners, &c., who died on March 1, aged 86 years, has been proved, the personality being sworn at £148,997. Desiring to make up to his late firm for the injury sustained by a clerk's fraud, the testator leaves them £7,000. The bulk of his property he leaves to his sons and daughters.

The promoters of the scheme for purchasing the late Lord Leighton's house as a memorial of the great painter have decided to prosecute the scheme with renewed vigour, as it is thought that the failure to sell the house by auction increases the prospect of success for the memorial movement.

The Court of Common Council have adopted a report of the City Lands Committee, recommending that the bronze statue of the Queen, by Mr. C. B. Birch, A.R.A., which Sir A. Seale Haslam has presented to the City, should be erected in the open space at the junction of Blackfriars Bridge and New Bridge-street, and the Victoria Embankment and Queen Victoria-street.

Professor W. B. Richmond, R.A., will deliver the two remaining lectures of his course on "The Vault of the Sixtine Chapel," at the Royal Institution on Wednesdays, May 27 and June 3, as he was unable to deliver them on April 25 and May 2, the dates previously announced, owing to indisposition.

A new drill hall, at Bournemouth East, erected for the local rifle volunteer corps, at a cost of over £3,000, was formally opened by Viscount Wolsley on Saturday.

At the Salford Town Hall, on May 21st, Mr. R. Walton, C.E., one of the inspectors of the Local Government Board, held an inquiry with reference to the application of the Salford Corporation for sanction to borrow £5,000 for electric-lighting purposes, £2,750 for the completion of a model lodging-house, £1,670 for the completion of a refuse-destructor, £1,364 for works of storm-water drainage, and £1,065 for making up and sewerage certain private streets adjoining the Tenerife-street and Walness-road playgrounds. Plans were produced, and explanations of the work proposed to be done were given by Mr. Corbett, the borough engineer and surveyor.

The Northumberland County Council have entered on the tenancy of their experimental and demonstration farm at Cokle Park, near Morpeth. The farm consists of 400 acres, of which about 80 acres are arable. It is leased for 21 years from the Duke of Portland, the landlord undertaking to spend £750 in putting buildings in order. The county council have voted the sum of £1,500 for equipment, and £500 a year towards maintenance.





THE S.A. MUTUAL LIFE ASSURANCE SOCIETY, JOHANNESBURG.—*Architect, W. H. STUCKE, A.R.I.B.A.*

#### MUTUAL LIFE ASSURANCE SOCIETY, JOHANNESBURG.

**T**HE illustrations of the Mutual Life Assurance Society, Johannesburg, taken from a photo. will give our readers some idea of the progress of Johannesburg, which will soon boast some of the finest buildings in South Africa, such as the New Chamber of Mines, Robinson's Bank, the Stock Exchange, Eckstein's Buildings, Henwood's Arcade, &c. The building for the Mutual Life Assurance Society (architect, Mr. W. H. Stucke) is fully occupied in the upper floors for offices, and the ground floor by some of the leading shops, and the basement as offices, café, &c. The building is furnished throughout with the best of imported materials, Welsh slates, Portland cement (costing 50s. to 55s. per cwt.), masons, bricklayers, &c., receiving an average of 22s. to 24s. per day of nine hours.

The ceremony of turning the first sod of the Cawood, Wistow, and Selly Light Railway is to take place at Cawood on Monday next.

#### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**EDINBURGH ARCHITECTURAL SOCIETY.**—At a meeting of this society, held on May 20th, Mr. A. R. Scott, president, in the chair, a paper was read by the vice-president, Mr. James A. Williamson, A.R.I.B.A., Public Works Office, on the "Influence of the Renaissance in Scotland." The paper, which was illustrated by drawings and photographs, dealt with the earliest traces of the foreign influence in the buildings of the 16th century, ancient records being quoted to show that as early as 1539 foreign workmen were employed at Falkland Palace, which appeared to indicate that, chronologically, Scotland was in advance of England by at least 20 years. The architectural characteristics of Linlithgow and Falkland Palaces, Stirling and Edinburgh Castles, also of Heriot's Hospital and buildings of subsequent dates in various parts of Scotland, were described in detail. The paper gave rise to considerable discussion, and, on the motion of the president, Mr. Williamson was heartily thanked.

#### CHIPS.

A drawing by Michael Angelo has realised, at a sale of a collection of drawings by old masters formed by the late Earl of Warwick, the sum of £1,400. The total amount realised for the collection was £8,061.

A Lords Committee passed, on Thursday in last week, a scheme promoted by the corporation of Glasgow for the prevention of the excessive pollution of the River Clyde. The scheme involves an expenditure of £600,000.

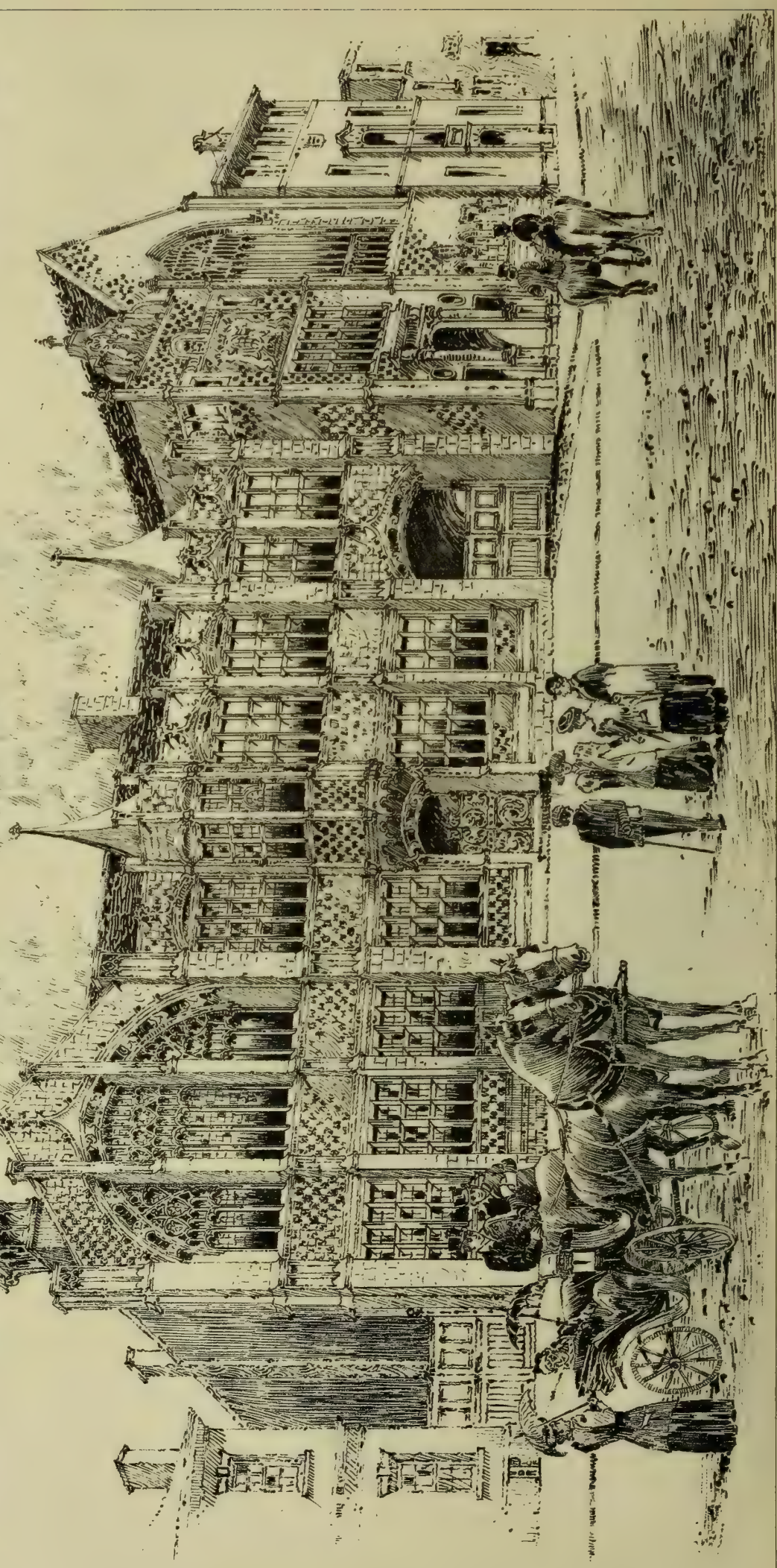
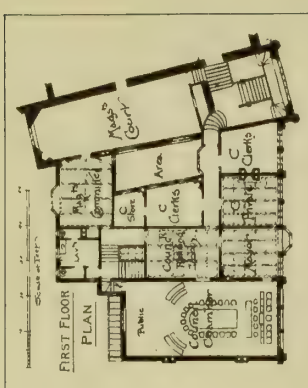
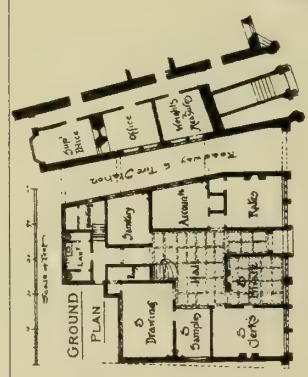
At the last meeting of the waterworks committee of the Hull Corporation, the engineer, Mr. Bruce, tendered his resignation of the office, such resignation to take effect from the date of the appointment of his successor. The committee unanimously decided to recommend the council to grant him £400, equivalent to a year's salary, on his retirement from office. Over 150 applications have been received for the office of waterworks engineer.

The new infant school at King's Bromley was dedicated last week by the Bishop of Lichfield. Mr. J. Hall Gibbon, of Birmingham, was the architect, and Mr. Wright, of Yoxall, was the builder.









MUNICIPAL BUILDINGS, KINGS-LYNN, AS COMPLETED. MESSRS PHILIP TREE & IVOR PRICE ARCHTS.  
Photo Lithographed & Printed by Messrs. J. & W. Alderman, 6, Queen Square, W.C.





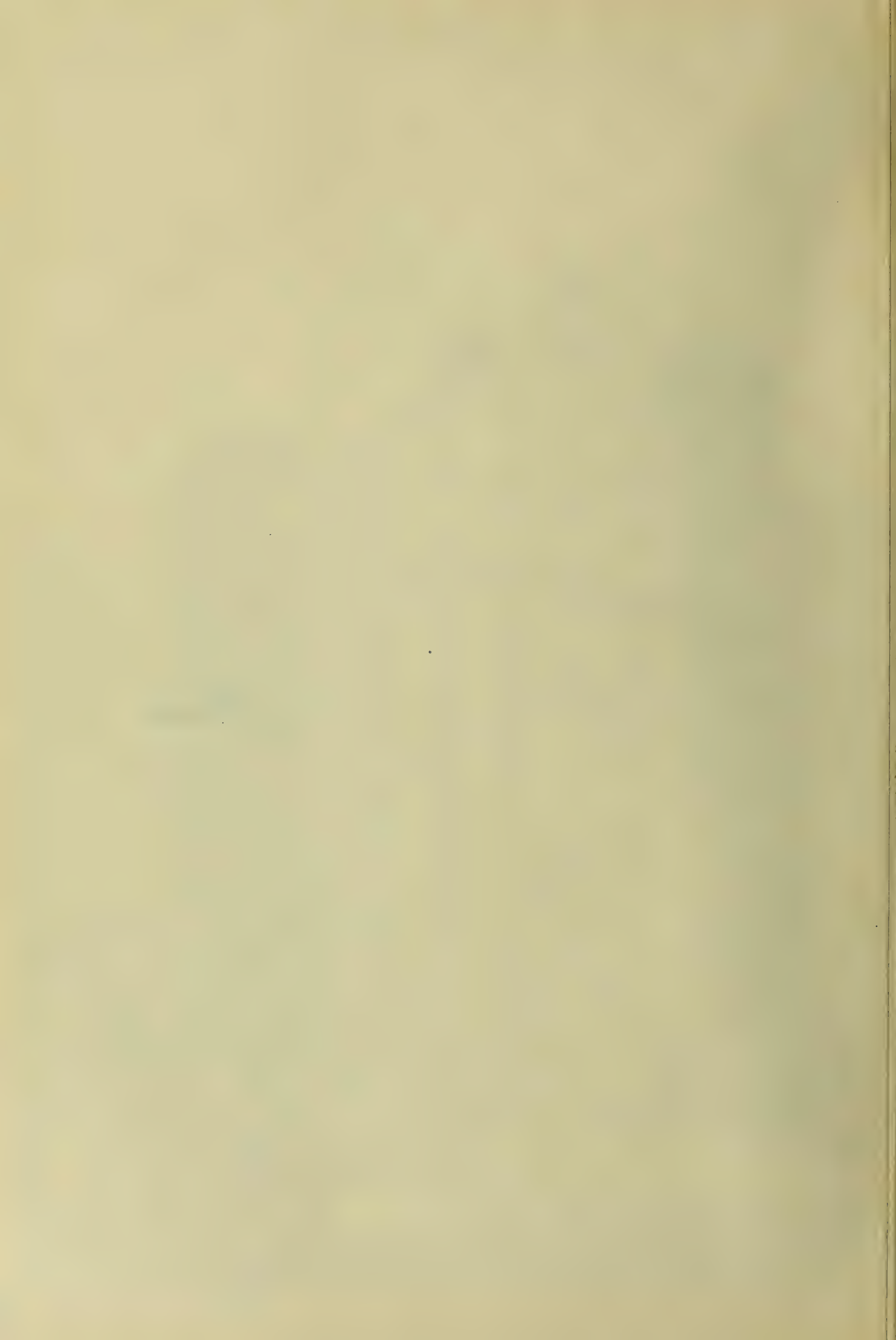


















THE BUILDING NEWS, MAY 29, 1896.





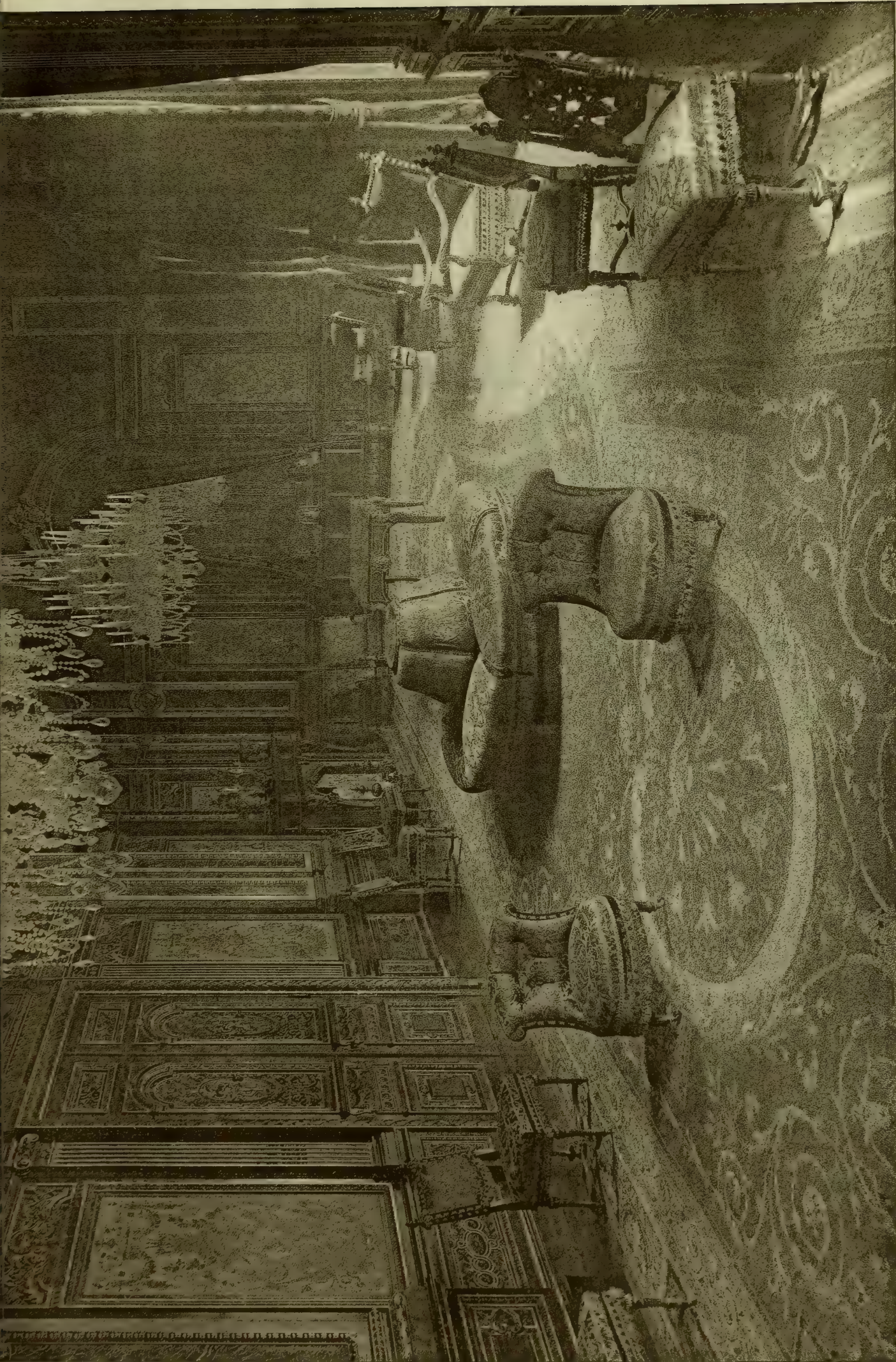


PHOTO TINT. BY CAMERON ARTHUR & CO. NEW YORK. 1885.

THE CITY GUILDS' NO 19.  
THE HALL OF THE MERCERS' COMPANY. THE DRAWING-ROOM.

THE CITY GUILDS' NO 19. WITH A GARDEN. 1885.

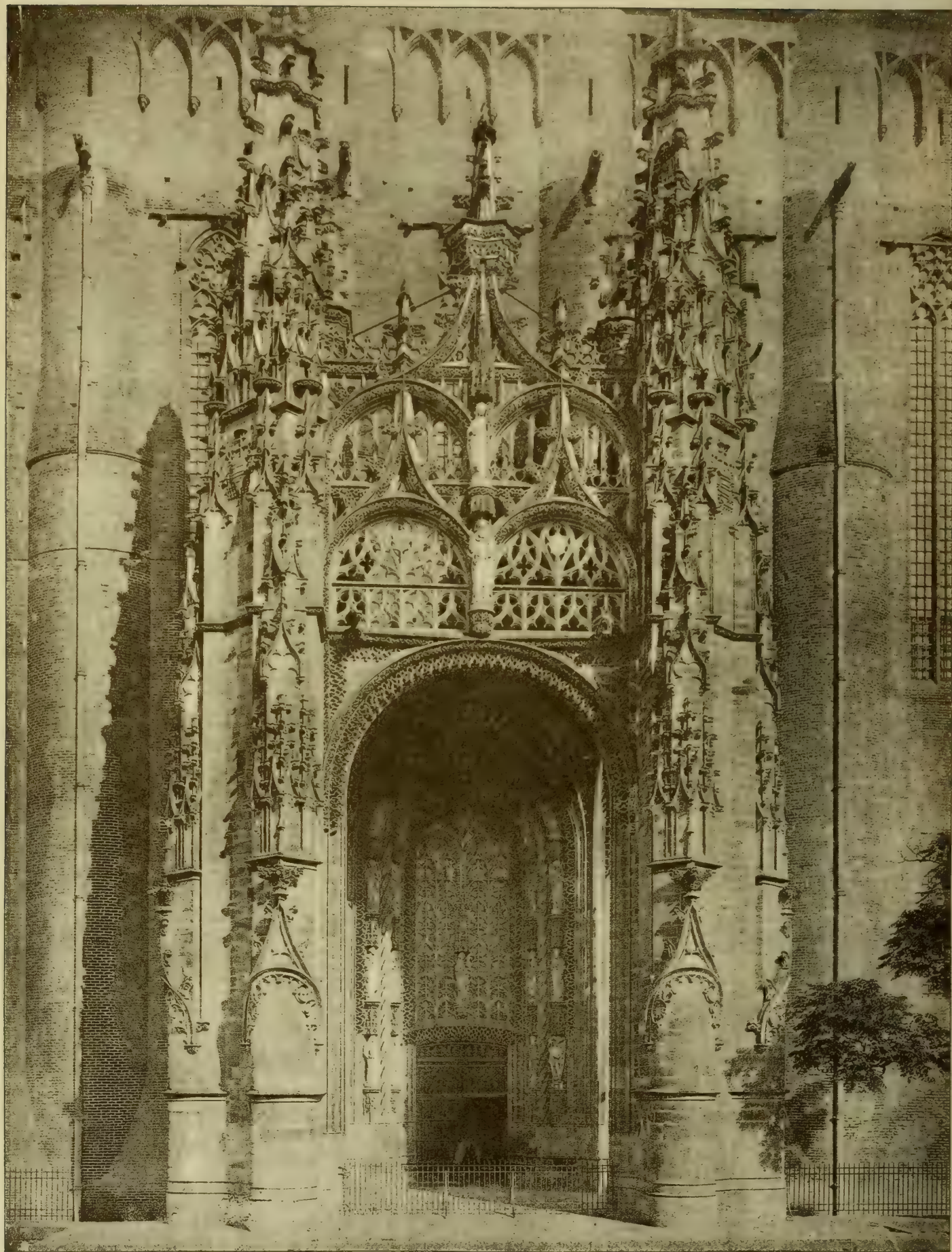








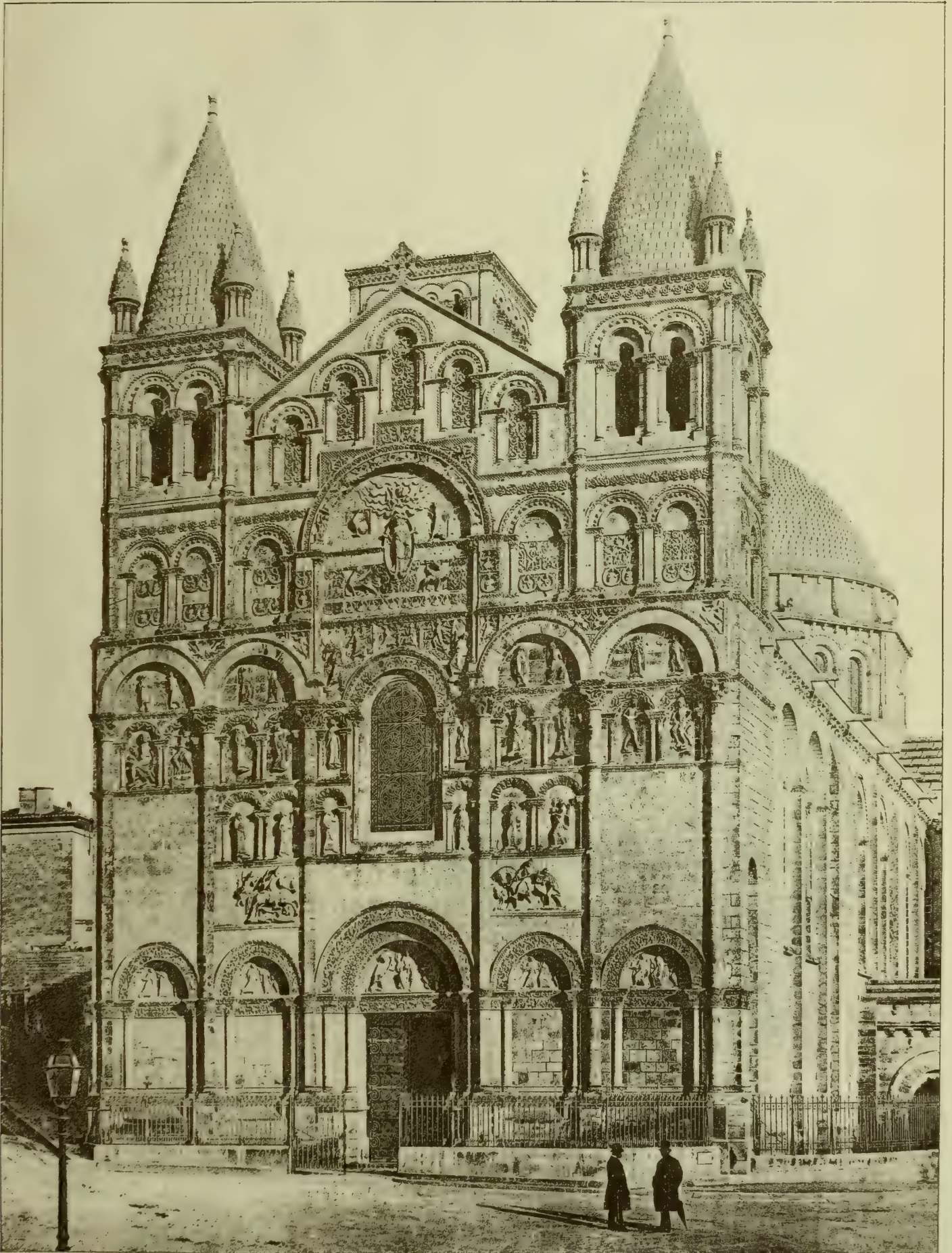




S. PORTAL · ALBI · CATHEDRAL ·



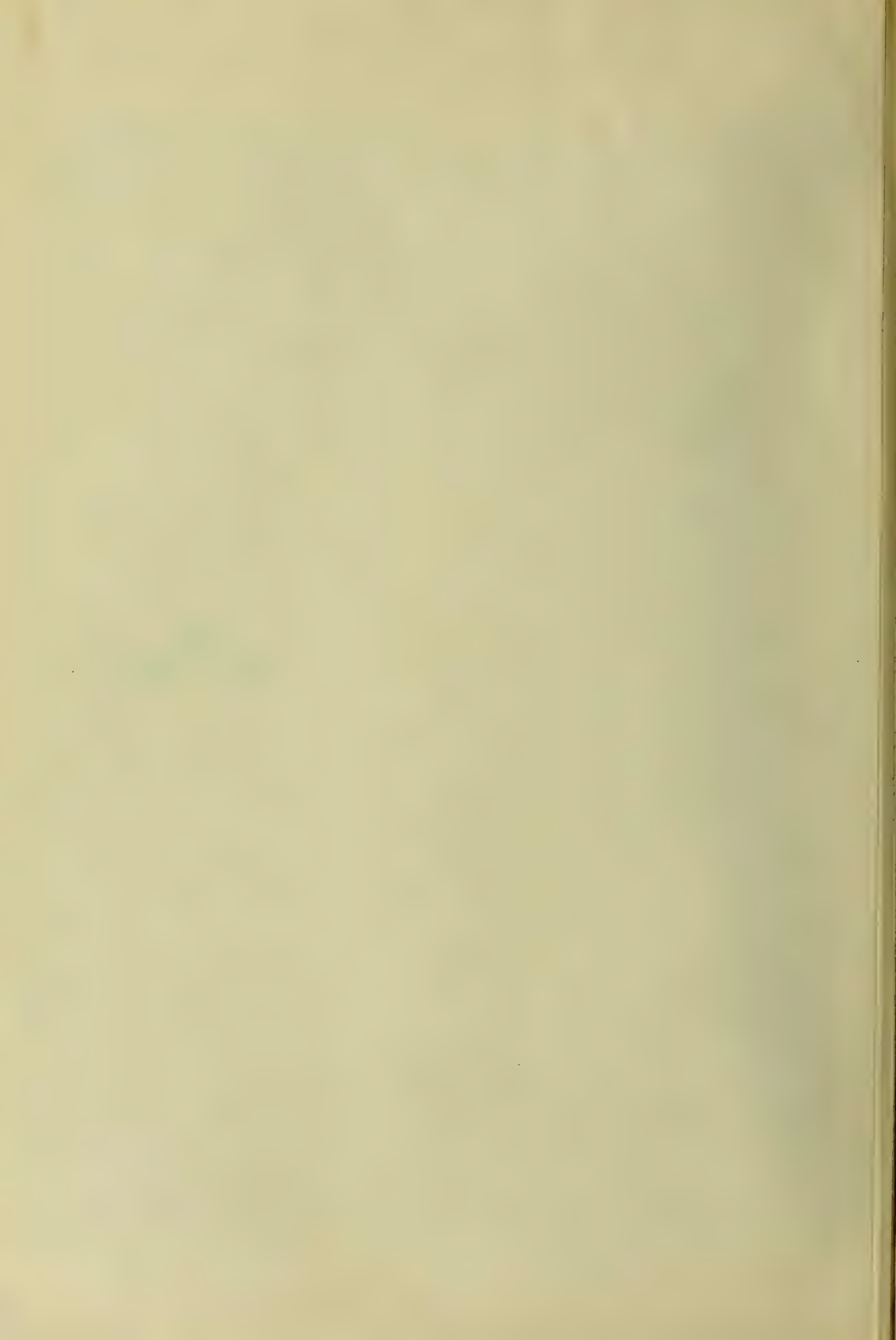
MAY 29, 1896.



"PHOTO-TINT" by James Akerman, 2 Queen Square London W.C.

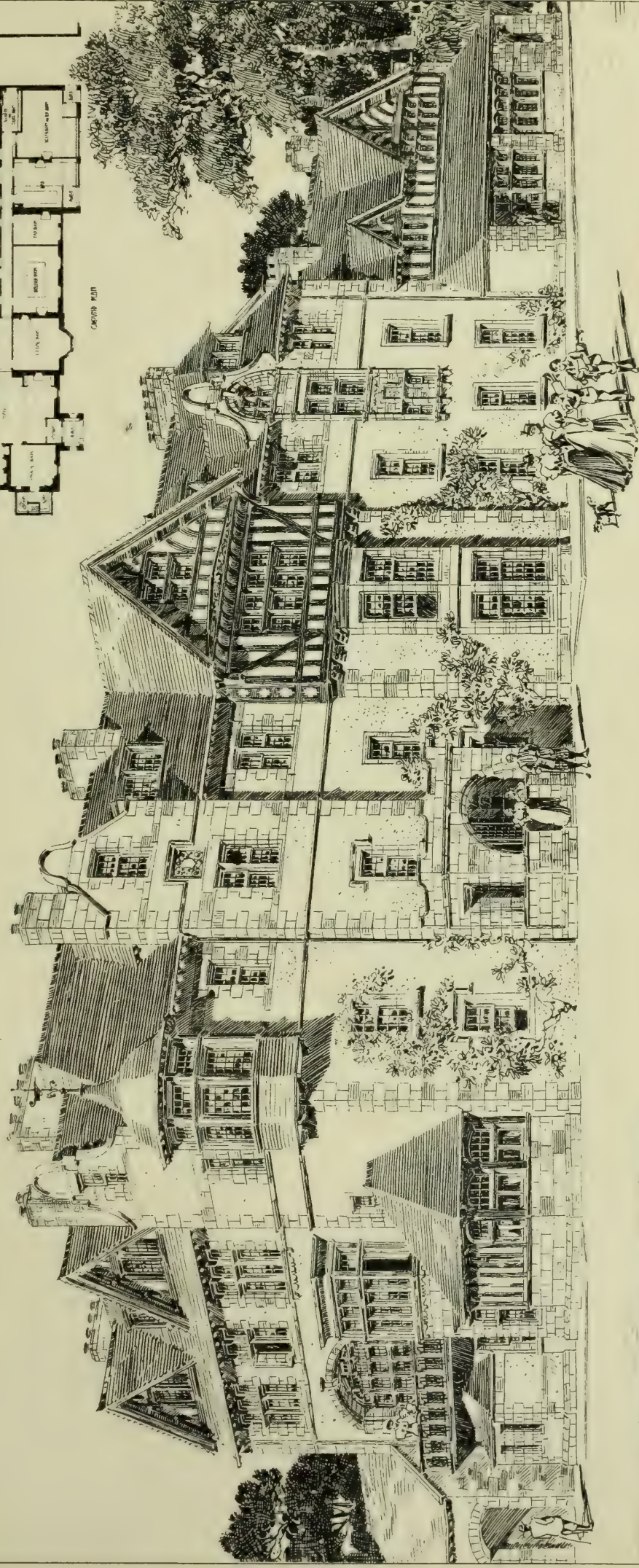
WEST FRONT · ANGOULÊME CATHEDRAL ·







EXTENSIONS: PANMURE  
ARMY HOTEL, EDZELL  
TWO-STOREY GROUND FLOOR



C. W. E. de la 94







TECHNICAL AND ART SCHOOLS LEICESTER

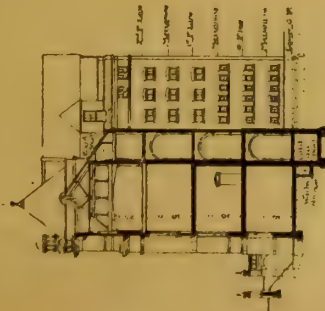


1st Floor Plan

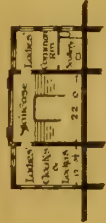


2nd Floor Plan

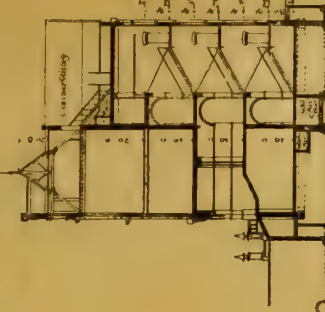
MESSRS EVERARD & PICK ARCHITECTS



Mezzanine



Mezzanine

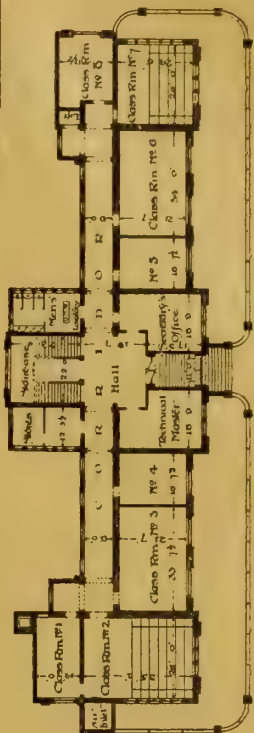


Transverse Section

Transverse Section



Lower Ground Floor Plan



Ground Floor Plan



## Building Intelligence.

**Bow, E.**—An addition to the Coopers' Company's School for Boys in Tredegar-square, Bow-road, was formally opened on Wednesday, and supplies a want long felt and much needed in the teaching of the school. The original building has been added to from time to time, but has no specially planned and fitted laboratories or lecture-rooms for science teaching and manual training, and the governors of the foundation determined, in order that the school should maintain its position and meet the needs of the present standard of education, that such a department should be added. The plans from which the new buildings have been erected were chosen by the governors, after consultation with Dr. Garnett, of the London County Council Technical Board, in a limited competition among architects, and have been designed by Mr. Howard Chatefield Clarke, of Bishopgate-street Within, who also designed and superintended the fittings. The new rooms are contained in a separate block added on to the west side of the existing school, adjacent to Trinity Churchyard, and are on two floors, having communication with the present buildings. On the ground floor the physical laboratory occupies the front portion of the wing, and the mechanical workshop and a dark room for optical work faces the playground in the rear of the buildings. The physical room is fitted with students' tables for 25 boys, demonstrator's platform, and other fittings and apparatus. The mechanical room is fitted with work-benches for each boy, and a demonstrator's platform. On the first floor the space is occupied by the chemical laboratory and a lecture-room, with preparation and store rooms attached. The chemical laboratory is fitted for 25 boys, each boy having at his hand water and gas supplies, and a small draught closet for minor experiments. For larger experiments there are special fume-closets and combustion-hoods built in the external walls. The lecture-room is seated for 50 boys, and has a lecturer's table, with supplies of gas and water at various points, and a pneumatic trough and screen for lantern-work. There is a system of water-waste drains and exhaust-flues from all parts of the laboratory, and also from the lecturer's table in the lecture-room and preparation-room. The cost of the building, exclusive of fittings, has been about £2,000. The fittings have been made by Messrs. Illingworth, Ingham, and Co., of London and Leeds. The building has been carried out by Messrs. J. and H. Cocks, of Stepney, under the personal direction of the architect.

**GARWAY, HEREFORDSHIRE.**—The ancient parish church of St. Michael's, Garway, one of the oldest in the diocese, dated 1061, having fallen into a very dilapidated condition, must undergo thorough repair and restoration. The vicar has accepted tenders for carrying out a portion of the work, which has been commenced, and includes the repair of the walls of nave, chancel, and Knight Templar's chapel. The stripping and relaying of the roofs, and a portion of the ceiling over nave, having already fallen, is also to receive attention. The work is being carried out under the superintendence of the architect, Mr. Ernest G. Davies, M.S.A., of Hereford.

**GORGIE, N.B.**—The New Free church at Gorgie has been opened by the Moderator of the General Assembly. Erected from plans prepared by Messrs. McArthy and Watson, Frederick-street, Edinburgh, at a cost of some £4,500, the structure is a parallelogram in design, divided by stone arcades into a nave and aisles, lying north and south, with a gallery at the north end. The front of the church faces Slateford-road, and the nave terminates at the other end in a semi-octagon, in which is a rostrum with a projecting pulpit, and a platform for the choir. The internal dimensions are 88ft. long by 50ft. wide, and 41ft. high to the apex of the ceiling. The roof is built of steel, and internally forms a pointed barrel vault, lined with wood, and divided into bays by moulded wood ribs. The church has been decorated by Mr. James Clark, George-street, Edinburgh. Accommodation is provided for 750 worshippers.

**LUNDY ISLE.**—The new church, to be dedicated, like its Mediæval predecessor, to the honour of St. Helena, is progressing apace, and will be probably completed by the early autumn. Mr. John Norton, F.R.I.B.A., 95, Ridgmount-

gardens, W.C., is the architect, and Messrs. Britton and Pickett, builders, of Ilfracombe, the contractors. Mr. Charles Pinn, of Exeter, is the acting clerk of works. The sculptured reredos, &c., are being carried out by Messrs. Harry Hems and Sons, of Exeter. Last week the ship, *Kate*, belonging to the contractors, sailed from Ilfracombe with a cargo of building materials for the new church. In spite of the general heavy sea running, all was safely landed; but afterwards the anchor dragged, and the vessel was driven on shore, where before the morning tide it became a complete wreck. No lives were lost, but the loss to the contractors will amount to some hundreds of pounds.

**MAR CASTLE, DEESIDE.**—For some time operations have been in active progress, and are now nearly completed, for rendering habitable the picturesque old castle of Mar, near Braemar. The work was intrusted to Mr. A. Marshall Mackenzie, A.R.S.A., architect, Aberdeen, and it is the intention of the owner, Mr. Farquharson, of Invercauld, to have the castle ready for occupation this autumn. The castle is associated with the Jacobite rising of 1715, and it was near it that the standard of rebellion was raised by the Earl of Mar. The architect has made no change upon the exterior of the building, the alterations having been almost entirely effected in the interior.

**NEWCASTLE-ON-TYNE.**—Trinity Presbyterian Church in Northumberland-street, Newcastle, was opened on Sunday. It has been designed by Messrs. Marshall and Dick, architects, of the same thoroughfare, whose plans were selected from amongst a number submitted in open competition. The design is a simple and free adaptation of the Late Gothic style, and it is faced externally with stone from the quarries at Kenton and Windy Nook. From Northumberland-road, entrance is gained to a spacious vestibule, with two cloak-rooms; and from the vestibule doors open to each aisle. To the right and left are doors connected with porches containing the staircases to the galleries, which are also provided with separate entrances. A corridor at each side of the church allows of direct access to the transepts and the seats near the pulpit end. The galleries are so arranged that most of the seats are placed near the pulpit, the remainder of the gallery projecting only a little way over the side corridors. No columns are used in the church. The accommodation provided is for 1,000 persons. A corridor separating the church from the hall gives immediate access to the church and hall on the ground floor, and contains a staircase leading to the galleries of both buildings, as well as the vestries. The hall is 62ft. 6in. long, and 44ft. 6in. wide, and accommodates 528 people on the ground floor and 80 in the gallery; and there are 13 class-rooms for 208 children. There is a smaller hall, for prayer meetings, to seat 200, and caretakers' rooms are provided at the further end. The church and hall are warmed with hot water on the low-pressure system. The building has been erected, under the architects' supervision, by Mr. G. H. Mauchlen, of Newcastle. Mr. M. Dodd has acted as clerk of the works.

**SUNDERLAND.**—Sir Hedworth Williamson, Bart., laid on Wednesday the foundation-stone of the extensions intended to be carried out in connection with the Monkwearmouth and Southwick Hospital, Roker-avenue, Sunderland. The scheme embraces a ward 60ft. by 20ft., accommodating 10 beds, and for an isolation ward for 3 beds. The first floor is a repetition of the ground floor, the extension thus providing a total extra accommodation of 26 beds. Other improvements are to be effected in the old buildings. The second-floor of the new building is divided into 7 bedrooms for the nurses and servants, with separate bath-room accommodation, and special staircase from the ground floor. A new laundry is to be built at the rear, divided into washhouse and ironing-rooms. The elevation to Roker-avenue is to be built in Sherburn bricks, relieved with stone dressings, and terracotta ornamentations. The contractor for the work is Mr. J. B. Stott, of Monkwearmouth, and the architects are Messrs. W. and T. R. Milburn, of Sunderland.

**TOXTETH.**—The foundation-stone of a new Congregational Church was laid on May 22. The church, which has been planned to occupy a narrow triangular-shaped strip of land at the junction of Hartington-road and Lesseps-road, is to consist of a nave and transepts, with a tower and spire at the end facing Smithdown-road. Accommodation will be provided for 500 worshippers; but arrangements have been made

for the future erection of a west end gallery and smaller galleries in the transepts. At the apse, where the new building adjoins the present schools, vestries and an organ chamber are to be provided. The building is being executed in Edwards' Ruabon bricks, with freestone dressings, the style being Decorated, with traceried windows of two and three lights. The seating and roof will be of pitchpine. The total cost of the building is estimated at about £3,500. Messrs. W. and J. Hay, of Liverpool, are the architects, and Messrs. Paterson and Son, the general contractors.

**WEST HAM.**—The church of St. Matthew has been opened. It has a frontage to two roads: its eastern elevation faces Dyson-road and the south side fronts on to Vaughan-road, and it is a conspicuous object from the main Romford-road. It is divided into nave and aisles, with slightly projecting transepts and a spacious chancel and organ-chamber. The style is Gothic of Late 13th-century date. The walls are very substantial, and are constructed with flintwork, with yellow brick quoins, reveals, and bands and patterns of brickwork. Good-sized choir and clergy vestries are placed to the north of the chancel, with a separate entrance-porch. The heating-chamber is constructed below the choir vestry, the system of heating adopted being low-pressure hot water, with circulating pipes placed in cement channels covered by gratings. The accommodation is for 680 persons. Adjoining the church, and on the north side, is a parochial hall, with class-rooms, kitchen, and offices, which are now approaching completion. The cost of the church has been £4,031, while the heating and fittings, including valuable presents from friends, amount to £376; the contract for the parochial hall is £680. The church and hall were designed by the late Mr. E. P. Loftus Brock, F.S.A. Since his decease, the work has been carried out under the superintendence of Mr. James Richardson (the late architect's chief assistant) with the kindly help and suggestions of Mr. Geo. Patrick, who has taken over the practice of the late Mr. Brock. The contract has been carried out by Mr. C. S. Parmenter, builder, of Braintree, Essex.

### CHIPS.

At the last meeting of the council of the Society of English Artists, George Morton and Oliver Baker were elected full members, and Edward Slocombe, P. E., Harry E. J. Browne, J. Bancroft, and E. Napier Kennedy, Associates.

On Thursday night in last week the body of Mr. D. S. Stewart, the War Office official superintending the construction of Lough Swilly fortifications, was found in the river Leden. The deceased went fishing on Wednesday. It is supposed the boat capsized.

At Harwich County Court, on Thursday in last week, Henry William Hogg, coal dealer, sued Mr. Saunders, builder, Dovercourt, for £50 damages for injuries sustained by him owing to a man in the employ of the defendant dropping, from a house in which he was employed, a mortar-board, which struck Hogg on the head, and caused such injuries that he was unable to pursue his avocation for six weeks. The jury awarded £15.

The mayoress of Wolverhampton unveiled on Saturday the memorial fountain erected in the open space in front of St. Peter's Collegiate Church, Lichfield-street, in memory of the late Mr. P. Horsman, the donor of the Art Gallery, and who also gave other munificent gifts to the town. The fountain, the cost of which amounted to £560, has been defrayed by public subscription. It is of white Portland stone, and was executed by Messrs. Farmer and Brindley, of London.

The urban district council of Mold, Flintshire, formally inspected on Thursday in last week the new sewerage works, which have cost about £7,000. The sewage is to be chemically treated by the Dortmund process. Mr. George Law, of Kidderminster, was the contractor, and Mr. A. Boosie the clerk of works.

In the ventilation of the new Dundonald Board School, Ayrshire, the architect, Mr. Thomas Smellie, Kilmarnock, specified, instead of the usual ornamental wooden turret on centre tower of building, one of the "Climax" patent ornamental design S, direct-acting louvre ventilators of very large dimensions, wholly made of strong galvanised steel, having water tray safe and large main ventilating shaft, into which the ventilation pipes from all the school rooms branch. This ventilator has been supplied by Messrs. Cousland and Mackay, ventilating engineers, Glasgow, the sole manufacturers of the "Climax" patents.



## THREE PHASES OF FRENCH CARVING OF THE SIXTEENTH CENTURY.



PANEL FROM COFFER FRONT.  
FIRST HALF SIXTEENTH CENTURY.



PANEL FROM OAK DOOR. MID-16<sup>th</sup> CENTY



PANEL FROM SINGING GALLERY LATE 16<sup>th</sup> CENTY

## FRENCH CARVING OF THE SIXTEENTH CENTURY.

THESE three examples of carved woodwork show the craftsmanship of three distinct periods within one hundred years—viz., the early, middle, and latter part of the 16th century. The first panel is from a coffer front, and shows a conventional arrangement of scrolls, foliage, and ribbons. The second is a design of thin interlacing bands with floral sprays above and below; this is a portion of a door. The third is a panel from a singing gallery of pierced strapwork with mask in centre; this latter is a typical example of French work at the end of the century in question. We illustrated a very fine cabinet of this period (where the strapwork and carving generally are of an exceedingly rich and varied character) in our issue of April 26, 1895.

## ANGOULEME AND ALBI CATHEDRALS.\*

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

MR. B. T. BATSFORD is issuing a handy folio of collotype prints from photographs illustrating the cathedrals of France, and these views are published under the auspices of the "Commission des Monuments Historiques," with M. Paul Robert as editor. The collection consists of 100 plates, of which the two reproduced by us to-day are selected specimens, and the price of the set is 32s. net. Of the two buildings which we have chosen for illustration very much might easily be said, for they are both remarkable instances of two vastly different types of work, and both rank among the most beautiful specimens of their kind to be seen in the whole of France. It must, therefore, not be presumed by the reader, although a large number of the French cathedrals are, of course, vast and imposing buildings, that all these churches are equal in character and importance to those thus illustrated by us to-day. Some have been rebuilt, others very much over-restored have lost what little interest they did possess, and some are small churches, comparatively speaking, with a very moderate amount of detail about them to be fittingly described as architectural. These qualifications have to be reasonably noted, and their consideration brings into prominence the fact that the architect may, and, indeed, very frequently does, acquire more suggestion from a small and relatively uninteresting church, in the popular sense of the word, than is

afforded by a big and ornate cathedral. And so it comes about that drawings and photographs of out-of-the-way and very likely almost unknown buildings may afford much that the student can consult with the utmost personal advantage, learning what to avoid as well as what to imitate, and he is for the greater part certain to discover features of both kinds in almost every building. Everyone must, after all, discriminate for himself, although the surpassing value of a cultured cicerone when visiting any building can, perhaps, be hardly over-estimated, should time and inclination combine with knowledge in explaining that which the student sees before him possibly for the first time. For the same reason the book or picture should be studied review in hand, if the remarks therein made are to be judged to the best advantage. Suffice it to say with regard to this collection of photographs by which so multifarious an assemblage of buildings is brought together, that it would be hardly possible to imagine a more diverse series of examples—some florid and Late, others plain and Early, many in the best phase of Continental Gothic, a few of the baldest and meanest period, some again in the Renaissance, both modern in the strictest sense, and some of a past period, as, for example, those of the 16th and 17th centuries; also detail studies of sculpture, ironwork, stalls, screens, and other woodwork. There are no plans, and beyond the index there is no letterpress. The prints, as a whole, are well done, and the points of view have been chosen exclusively to show the buildings selected for illustration, the pictorial giving way to the practical utility of the plates. A mere mention of the names of some of the leading buildings makes an imposing array—Amiens, Bayeux, Bourges, Chartres, Coutances, Evreux, Limoges, Paris, Rheims, Sens, Soissons, Tours, Troyes, and Versailles. Angoulême Cathedral, typical of the smaller churches of La Charente, is an enlarged example of the parish church of that district, which is particularly rich in Romanesque architecture. The nave of Angoulême has domical vaulting similar to that at Périgueux, Cahors, Loches, and other places, as may be seen in the A.A. Memorial Volume to the late Mr. Edmund Sharpe in illustration of the excursion which he conducted in 1875 (see BUILDING NEWS, June 16, 1876). The west front is undoubtedly the most beautiful and elaborate part of the cathedral. Following the rule common in the south of France at that period, it has only one door and one window, leaving a vast wall surface for decoration, thereby producing a broad and extremely handsome effect. Five bays of semi-circular arches are carried up to the parapet level

of the aisles, and above these as well as within the interspaces are a series of smaller arches filled with sculptures of figures, animals, medallions, and foliations. Over the west window in a vesica is a representation of the Majesty surrounded by the Emblems of the Evangelists, whilst the arch above is formed by a series of eight angels. The Cathedral of St. Peter at Angoulême was a very early foundation—in 570, and it was rebuilt during Grimoard's bishopric, and finished in 1017 A.D., after occupying nearly forty years in building. The existing church is of later date, probably the 12th century, about the prime of the Romanesque period. Some of the statues possibly belonged to the earlier church. The Calvinists, in 1562, wrecked the building, and stole the gold and silver vessels belonging to its sanctuary; while, six years after, the same Protestants endeavoured to destroy the fabric itself, with so much success that they brought the tower down to the ground. In 1628 these damages were partly made good, and during the present century the building has been "done up" more than once. Albi Cathedral, dedicated to St. Cécile, was commenced in 1282 by Bishop Bernard de Castenet, and consecrated in 1480, but was not finished till 1512. The church itself is constructed entirely of pink brick, and is devoid of ornamentation, but the south porch, built entirely in stone by Cardinal Louis d'Amboise and his successors, Bishops Joffroi and Aymar Gouffier, who finished it in the 16th century, while the structure bears on its faces the arms of its builders. The porch is a truly grand specimen of the Flamboyant style—a labyrinth of lacelike traceries and cusps: a perfect veil of stonework—and yet, with all its richness of detail, the general composition is marked by great breadth of treatment and simplicity of outline—two conditions of the utmost importance—and hence the splendid result. The fine screen inside the cathedral, by the same hand, is equally beautiful and worthy of admiration. We have said enough to indicate the utility of the series of photographs which Mr. Batsford is publishing for M. Paul Robert.

The new athletic field at Colinton-road, Edinburgh, which has been acquired for the use of the students attending Edinburgh University, was formally opened on Friday by the Marchioness of Tweeddale. The ground, which has been prepared, levelled, and laid out under the direction of Mr. William Penman, C.E., is 13 acres in extent, and has cost about £10,000, including site, boundary walls, and temporary pavilion.

\* The Cathedrals of France. Paris: Paul Robert. Editeur, 16, Rue de la Tour. London: B. T. Batsford, 44, High Holborn, W.C.



## OBITUARY.

MR. EDWARD ARMITAGE, a retired Royal Academician and former Professor of Painting at the Royal Academy, died on Sunday at Tunbridge Wells, at the age of 79. Mr. Armitage was educated in France and Germany. In 1837 he entered the studio of Paul Delaroche in Paris, and he was chosen by that master to assist him in the decoration of the hemicycle at the Ecole des Beaux Arts. Three years later Mr. Armitage sent a large picture of "Prometheus Bound" to the Paris Exhibition of Living Painters. To the Cartoon Exhibition at Westminster Hall in the following year he contributed "The Landing of Julius Cæsar in Britain," which took a first-class prize of £300. In 1844 he contributed to the Westminster Hall exhibition of works in fresco, but without success. At the third competition in 1845 he took a prize of £200 for a cartoon and coloured design, "The Spirit of Religion," and finally, in 1847, another first prize of £500 was awarded to him for an oil painting, "The Battle of Meenace," which is now the property of the Queen. During the Russian war he visited the Crimea, and painted two pictures, "The Heavy Cavalry Charge at Balaklava" and "The Stand of the Guards at Inkermann." In 1858 he produced a colossal figure, entitled "Retribution," and intended to symbolise the suppression and punishment of the Indian Mutiny. In the upper waiting-hall of the Palace of Westminster he executed two experimental frescoes, "The Thames with its Tributaries" and "The Death of Marmion," and in the Roman Catholic Church of St. John, at Islington, he painted "St. Francis and his Early Followers before Pope Innocent III.," and decorated the apse with figures of Christ and the Twelve Apostles. In 1869 he was engaged upon the monochrome series of wall-paintings in University Hall, Gordon-square. From 1848 till 1893 he was a regular contributor to the Academy exhibitions, generally with Scriptural or historical subjects. Mr. Armitage was elected A.R.A. in 1867 and R.A. in December, 1872. In 1875 he was appointed professor and lecturer on painting to the Royal Academy, and two years since he was placed on the list of retired Academicians. In 1866 he presented his painting of "The Remorse of Judas," after exhibition in that year's Academy, to the National Gallery, and last year he gave a large picture to the Guildhall Art Gallery. He gratuitously executed six wall-paintings, representing, in life size and at full length, Noah, David, Isaiah, the Virgin Mary, St. John the Baptist, and Our Lord, in the parish church of St. Marylebone.

The business of the late Mr. Bradshaw Brown, recently carried on by him at Billiter-square Buildings, E.C., and Millwall, E., will in future be conducted by Mr. Harry Hooper (the late Mr. Bradshaw Brown's senior partner in the Millwall business) and Mr. Thomas W. Price, F.S.I. (for many years manager and confidential clerk to the late Mr. Bradshaw Brown), and the name of the firm will be Bradshaw Brown, Hooper, and Price.

The committee of the Sunderland Infirmary journeyed to Harrogate on Wednesday week for the purpose of witnessing the opening ceremony of the new wing to the Heatherdene Convalescent Home. The home, which is situated in the Lancaster Park at Harrogate, was opened on September 15, 1892, in conjunction with the Sunderland Infirmary, for women and girls requiring convalescent treatment. The new wing will accommodate 18 male patients, there being now a total of 40 beds. The total cost of the new wing is £4,525. It is in keeping with the design of the original building, and is faced with local stone. It consists of three stories, the lower floor being connected with the older building. The contractors were Messrs. Ives and Co., of Shipley, near Leeds, and the architect was Mr. John Eltringham, of Sunderland.

The foundation-stone of an electric-lighting station for Chester was publicly laid last week in the Tower Field gardens. The present range of supply is the "compulsory area,"—everywhere within the city walls, except Lower Bridge-street and Nicholas-street—but the machinery and plant will be ample to supply an extended area. The site of the station being already the property of the corporation, £22,000 will cover the cost of the first installation, this amount including £6,200 as the cost of the station buildings and £10,500 as the cost of the station plant. Professor Alexander B. W. Kennedy is the electrical engineer, and the contractors for the buildings are Messrs. Thomas Parker, Limited, of Wolverhampton. The buildings will be faced with red Ruabon bricks, with terracotta balusters and capping, and the chimney shaft will be 140ft. in height.

## Engineering Notes.

**BIRMINGHAM.**—A railway improvement, which has been in progress for some years past, was completed in Birmingham last week, when the new southern tunnel approach to New-street Station was thrown open to traffic. The object of the extension is to give to the North-Western and Midland companies independent approaches, and to do away with the system of joint lines and crossings of rails on the level which has made the traffic so difficult to work, and which was the cause of frequent delays and danger. Soon after the new portion of the station was built it was found advisable to assign it exclusively to the Midland traffic; but up to the present the whole of the trains of the two companies entering and leaving the station on this side have had to use one tunnel with but one up and down line. Exclusive of permanent way and signals, the purchase of land and buildings, the work has cost about £100,000, while the total outlay has been something like a quarter of a million. The work has been done from joint plans of Mr. Francis Stevenson, of the North-western, and of Mr. J. A. McDonald, of the Midland Company. Messrs. Holme and King, of Liverpool, were the contractors for the tunnel just opened, and for the works of widening from Gloucester Junction, Saltley, to the entrance to the tunnel, the contract has been taken by Mr. J. T. Firbank, M.P.

**EDINBURGH.**—The foundation-stone of the new North Bridge in Edinburgh was laid by the Lord Provost of the city with Masonic ceremonial. The work is closely connected with the reconstruction of the North British Railway Station in the valley below the bridge. The old North Bridge, completed in 1772, and now in course of demolition, led directly to the creation of the New Town, including as it does Princes-street, George-street, Queen-street, St. Andrew-square, and Charlotte-square. In 1876 the exigencies of the ever-increasing traffic made it necessary to widen the bridge, by means of lateral footways supported on iron brackets, to the extent of 18ft. In the new bridge the width between the parapets will be increased from 57ft. to 75ft., and whereas the old bridge, consisting of three main and two flanking arches, was only 310ft. long, the new bridge, comprising three spans of 175ft. each, will extend to 525ft. Whereas the viaduct of the old bridge was horizontal, that of the new bridge will slope upward from north to south, so as to diminish the gradient of North Bridge-street. The eastern half of the new bridge is now far advanced towards completion, while the traffic is continued on the western half of the old bridge under restrictions. The cost is estimated at £90,000 independently of the price of the two tenements in North Bridge-street removed to improve the gradient, and of that sum £30,000 has been contributed by the North British Railway Company. The engineers are Messrs. Cunningham, Blyth, and Westland, C.E., Edinburgh; the architect, Mr. R. Morham; the contractors, Sir William Arrol and Co. (Limited), Glasgow, with Messrs. W. Beattie and Sons, Edinburgh, as sub-contractors for the masonry work.

**MORLEY.**—The first sod of Bruntcliffe reservoir for the improvement of the water supply to Morley, was cut by Lord Dartmouth last week. Until two years ago, the borough was supplied with water by the Leeds City Council, but independent works were constructed between 1891 and 1894. The source of supply is at Withens Clough, Mytholmroyd, twenty-one miles distant from Morley. The surface waters flowing off the moors and high lands is impounded in the Withens Clough Reservoir, which has a capacity of three hundred and thirty million gallons, and is at an elevation of 960ft. above the sea-level. The water flows from thence in an iron pipe conduit through thirteen towns and districts to Morley. The Bruntcliffe Service Reservoir, when completed, will be 330ft. long by 300ft. wide, and the depth of water will be 20ft. It will have a water surface of 2½ acres, and the capacity will be ten million gallons, above one week's supply. The level of the water when the reservoir is full will be 60ft. above that of the sea. The bottom of the reservoir will be lined with clay puddle, and a core of puddle will be brought up in the centre of the embankment to render it watertight. The whole of the inside of the reservoir will be covered with stone paving. The form of construction has been specially designed with a view to safety, should any movement occur owing to the working

of the coal underground. The contract for the works has been let to Messrs. H. and E. Bower, of Halifax; the Staveley Company supply the iron pipes; and Messrs. Blakeborough, of Brighouse, the iron outlet, tower, and other fittings. The whole of the works at Cragg Vale and Bruntcliffe have been designed by Mr. Charles Gott, M.I.C.E., Bradford, the engineer to the Corporation, and are being carried out under his supervision.

## CHIPS.

The Hants County Council have purchased the old grammar school at Southampton for £2,250, and will utilise the building as a county police station.

The town council of Grantham have elected Mr. Francis J. Morris, of the same town, as borough surveyor, in succession to Mr. J. Evans, resigned. There were 84 candidates for the appointment, although the salary begins at only £150, rising by £10 per annum to £200.

The partnership heretofore subsisting between E. H. Jones and H. T. Thornley, described in the *London Gazette* notice as "architects, surveyors, builders, and insurance agents," Cardiff, under the style of Jones and Thornley, has been dissolved.

Messrs. Price and Son, of Westminster, have accepted the contract to complete the harbour defence boom at Southampton, at a cost of £8,650.

An interesting ceremony took place on Tuesday at the colony established by the National Society for the Employment of Epileptics, at Chalfont St. Peter's, Bucks. Through the generosity of Mr. Passmore Edwards, a home for 36 men has already been erected, and the same gentleman has offered to build one for women, and also for children. The site of the colony was also the gift of Mr. Passmore Edwards. The foundation stone of the home for women was laid on Tuesday, with Masonic honours, by Lord Addington, Provincial Grand Master for Bucks, assisted by the officers of the Provincial Grand Lodge.

The annual meeting of the Royal Architectural Museum and Westminster School of Art will be held at the museum this (Friday) afternoon at 3 p.m. for the election of council and other officials for the ensuing year, and the reception of the report of the council and statement of accounts. The Duke of Westminster, K.G., president of the Institution, will occupy the chair.

The annual general meeting of the members of the Art for Schools Association will be held at 29, Queen-square, Bloomsbury, on Wednesday afternoon next. The chair will be taken at 5 p.m. by Professor Woolridge, Slade Professor of Fine Arts, supported by the Rev. Professor Shuttleworth and other speakers.

Foundation-stones of a railway mission hall were laid at Worcester last week. The buildings are being erected in East-street, Arboretum, and will cost upwards of £1,000. The hall is to be 70ft. by 27ft. 8in., and adjoining are a committee-room, 15ft. by 14ft., a kitchen, and a cellar under the hall, fitted with hot-water apparatus. The front wall, next street, is faced with Dennis red Ruabon bricks, with red moulded bricks for strings, &c., and Bath stone for bands in piers and heads of lower windows. The roof will be covered with slates with red ridge tiles. The roof principals will have hammer beams, with curved brackets and corbels under. The ceilings will be plastered, and all will be warmed by hot water on the low-pressure system. Messrs. Bromage and Evans are the contractors for the hall, and the works are being carried out from the designs of Messrs. Yeates and Jones, architects, Foregate-street.

An unusually heavy amount of business was transacted at the Auction Mart last week; indeed, no individual week in recent years has produced a total of such magnitude. The returns included landed, residential, and building estates, West-end houses, and other properties. The reported aggregate for the week is the high figure of £265,763, and adding to this the amount of Messrs. Edwin Fox and Bousfield's sale on Wednesday in the same week, £69,875, the grand total is given of £335,638, a record for many years.

On Saturday the memorial-stones of a new Primitive Methodist chapel and schools, which are being erected in Ward-street, Priestfield, Bilston, were laid. The buildings will be erected of red brick, with stone facings; and, while the chapel will have seating accommodation for 200 persons, the school will have space for 250 children. The cost is about £1,100.

The building trade in Aberdeen is at present unusually brisk, and on Friday the plans committee of the town council sanctioned the erection of twenty dwelling-houses. Plans were also passed for an extension to the electric-lighting station, enlargements at Gilcomston Mill, and additions to existing dwellings and business premises. The value of the works is estimated at £21,725.



## COMPETITIONS.

BELFAST TOWN HALL.—A joint meeting of the Improvement and General Purposes Committee of the City Council of Belfast was held on Wednesday week, when the assistant engineer submitted draft plans and conditions for the guidance of architects in the competition for design of the proposed new Town-hall, and it was unanimously decided to refer these to the Council of the Royal Institute of British Architects, with the view of obtaining their opinion on the conditions, &c., and the nomination of three of the leading members of the profession for the guidance of the Corporation in the selection of an assessor.

BRISTOL.—At the last meeting of the Bristol Sanitary Authority, the engineer, Mr. Yabicom, reported that the sub-committee appointed to consider the designs submitted for the erection of a shelter on the triangular space at St. Augustine's recommended the selection of design No. 6. The engineer added that, in accordance with instructions from the committee, he had submitted the plans to a well-known quantity surveyor, who was of opinion that there was reasonable expectation of the work being carried out for the sum of £3,000, and not for £2,500, as was estimated by the architect. The committee having agreed to award the premium to No. 6 and submit the plans to the council, the sealed envelope was opened, and it was stated that the architect was Mr. W. V. Gough, Bridge-street, Bristol, the architect of the new branch free library in St. Philip's. The design provides for a building with a brick façade and glazed verandah. There is a small turret at each angle, and a central clock-tower with openings for six illuminated dials. The building provides for one central waiting-room, with lavatories at two angles and a post-office at the other. There are entrances upon each face of the triangle.

The fourth annual Fine Art Exhibition was opened in the Albert Institute, Dundee, on Monday, by Professor Patrick Geddes, who remarked that the display showed distinct progress both as regards quality and quantity as compared with previous exhibitions. The secret of the marvellous wealth of art treasures to be observed in Italian cities lay in the organisation and regularity of employment of the schools formed there. He urged that attention should be paid to this in Dundee, and that artists should be given constant employment not only with reference to painting pictures for local collections, but also in decorative work for large private and public buildings.

Clydebank, opposite Renfrew, which a quarter of a century ago was a pastoral district, and has now a working-class population of 25,000 and a rating valuation of £62,000, is being rapidly extended. Over a hundred new properties, chiefly of the tenement class, are in course of erection at the present time. Both the Episcopalian and Roman communions are dispossessed of their former edifices by the extensions of railways, and they have been rebuilding in the east end of the burgh. The Episcopal church, which is situated at the corner of Douglas-street, is nearly completed, while the Roman Catholic chapel, school, and presbytery house, which are in close proximity, are now in course of erection. A new established church has been prospected for at Yoker, and the Old Kilpatrick School Board intend to erect a new public school.

New premises for the Mid-Gloucester Conservative and Unionist Club were opened at Stroud on Tuesday. The building has a frontage of about 60ft. to Russell-street and Great Western-road. Over the principal entrance in Russell-street is a balcony, and to the front of the second floor is an open promenade. On the ground floor are the bar, dining-rooms, &c.; on the first floor is a large hall, measuring 54ft. by 28ft. by 18ft., and rooms for ladies. On the second floor is a billiard-room, with two tables; there is a third billiard-table on the ground floor. In the basement, besides the kitchen cellars, are the gas-engine and other plant for electrically lighting the building throughout. There are eighty lamps, giving a total of 5,600 candle-power. The building, irrespective of site or internal decoration, cost over £1,000.

A new reredos has been erected in the Lady-chapel at Salisbury Cathedral. It takes the form of a triptych in oak, rising from an alabaster retable, and has been executed from designs by Sir Arthur Blomfield. The centre represents the Adoration of the Magi, and the panels to the left contain two paintings, the subjects being the Annunciation and Salutation, while on the right are depicted the Presentation in the Temple and the Finding of the Youthful Christ among the Doctors. The framework, including the crest and canopy, contains decorative carving by Mr. John Thompson, of Peterborough, who is carrying out the restoration of the spire.

## Correspondence.

## CONTRACTS AND QUANTITIES.

To the Editor of the BUILDING NEWS.

SIR,—I have been very much interested in the correspondence which has appeared in the "B.N.," and I endorse the opinions expressed therein by Mr. Kinder and "A Country Contractor," and I should like to emphasise the suggestion that building and quantity surveyors should form an institution of their own, where the different points frequently occurring in practice could be discussed and ventilated, and, if possible, surveyors might arrive at a more uniform mode of measurement than at present in vogue in the different parts of the country, so that the provincial surveyors might be brought more in touch with the London surveyors.

In my opinion this matter should be taken up by the leading London and provincial surveyors, and an effort should be made to form a Building and Quantity Surveyors' Institute, so that building owners and public bodies generally should rightly understand the quantity surveyors' functions, and instead of their appointment being left with the architect who has prepared the plans, it should be made direct.

Now often the quantities are prepared in the architect's own office—in some instances by themselves, but more often by their assistants, with little or no practical experience or training in that capacity. Samples of such quantities have been already referred to by "A Country Contractor."—I am, &c.,

A PROVINCIAL SURVEYOR.

## CHIPS.

In his report on the Halifax water supply, the medical officer of health for the borough, Dr. Ainley, says:—"The obvious lesson taught is the discontinuance of the use of all lead pipes as far as possible."

Work has just been commenced in the extension of the Fish Dock at Grimsby. The estimated outlay is £150,000.

The new infirmary at Monaghan was formally opened by the Lord-Lieutenant of Ireland, on Friday.

One of the three victims of the disaster to a yacht on Lake Windermere on Saturday night was Mr. Henry Knowles Wright, aged 21, of Bowdon, near Manchester, described as an architect. He had only recently been married.

According to Professor Bodio, of 8,254 communities in Italy, 1,454 have no supply of pure water, and 4,877 no regular sewage system.

A peal of ten bells is being cast for Ewerby Church, near Sleaford, Lincolnshire, the tenor of which will weigh 20cwt. The cost will be borne by the Earl of Winchelsea and members of his family, who have already subscribed large sums for the restoration of the interior of this edifice.

The Marden School Board have adopted plans by Mr. H. Jeffery, of Ashford, for new schools for 430 scholars.

Mr. Alfred W. Ayres, builder and contractor, of Dover, who is a member of the town council, has been placed on the commission of the peace for that borough. He succeeded his father in business, and has carried out a large number of building contracts in Dover, including many for the War Department.

The foundation stone of a new town-hall and municipal offices was laid at Merthyr Tydfil on Thursday in last week. The buildings are Free Renaissance in style, and are being erected from plans by Mr. Johnson, selected in competition. Mr. Gibbon is the contractor.

The town council of Brighton have decided to partially rebuild and extend the sanatorium at an estimated cost of £21,000.

A stained-glass window has been placed in the parish church of Chard by public subscription. The window, which is the work of Mr. F. Drake, of Exeter, represents the Presentation of Christ in the Temple.

On Whitsun Eve, at St. Jude's, South Kensington, the organ, which has been reconstructed by Messrs. Walker, was dedicated and reopened. The total cost of the work was £1,711.

The Secretary for War has accepted tenders for the reconstruction of the drainage at Chelsea Barracks, which were recently denuded of troops, and the work is to be commenced at once, so that the barracks may be reoccupied by the Guards in the autumn. Additional barrack-rooms are also to be erected before the troops return.

## Legal.

## CONSTRUING A COVENANT.

WHAT is the meaning of the words "at the end of the said term," as used in a lease for 21 years, with tenant's option to terminate by notice at end of seven or fourteen years? That was the point in the recent case of "Bevan v. Chambers" (*Times*, May 16). The plaintiff had demised a farm in Essex to defendant for 21 years from 1881 at an annual rent. The lessee had converted a large part of the land into a fruit farm, and had planted a quantity of gooseberry and currant trees. The lease gave the tenant an option to put an end to the lease at seven or fourteen years by written notice, with a proviso that "at the expiration or sooner determination" of the term the landlord should pay the tenant compensation for certain buildings on the farm. It also contained a further covenant by the lessor, and upon which the present point was raised; wherein he agreed to compensate the tenant for various things, and especially for the gooseberry and currant trees that might be grown or left on the farm "at the end of the said term." The tenant had given notice to terminate at the end of the 14 years, and the point at issue between the parties was whether he could claim compensation for these trees, the lessor contending that he could not do so, because, by giving the notice under his option, he had not waited until the "end of the said term," as the covenant provided.

Mr. Justice Mathew and the Divisional Court had seen nothing in this fine point, and had held that the lessee was entitled to compensation for the trees he had so planted and left upon the farm; but the lessor had appealed. The Master of the Rolls and the Lords Justices emphatically supported the views of the Court below, and dismissed the appeal. They held that the tenant, by giving notice, had put an end to the term, as he had a right to do; and the term having come to an end, the tenant was clearly entitled to his compensation as the lease provided. It was true that in another covenant the expiration of the term by effluxion of time, and its determination by notice were separately mentioned, as is usual; while in this one only the end of the term was specified. But even if both constructions were possible, still, where one was reasonable and would produce justice, and the other would work absolute injustice, the Court would adopt the former. The defendant was, therefore, held entitled to his compensation in regard to the improvement of his landlord's property, and a very pretty point of technical construction came to nothing.

FRED. WETHERFIELD, Solicitor.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

The Victoria Theatre, at Newport, Mon., was destroyed by fire on Wednesday. Only the stone walls remain. Three shops, an auctioneer's office, and rooms in the basement were also gutted. The total damage is estimated at £10,000.

A statue of the late Earl Granville, by Mr. Hamo Thornycroft, R.A., will be unveiled in the central hall of the Houses of Parliament on Monday. The new statue will stand in front of the telegraph office, the three other corners being occupied by statues of Mr. John Bright, the Earl of Idlesleigh, and Lord John Russell.

On Friday the Bishop of Derby reopened Smisby Church, which had long been falling into a state of decay. The box-pews and rotten flooring throughout the church have been removed, the plaster, paint, and whitewash cleared away from the walls, the caps and bases of piers have been cleaned and renovated, and the stonework inside the church repaired and pointed. The glazing and stonework of the windows have been renewed. The floor has been relaid to an altered level with wood-blocks on concrete; the nave, aisle, tower, and porch have been repaved with Hopton stone; the sacrum repaved with marble, and the chancel with wood-blocks throughout. There is a new altar-table and cover, Communion rail, and kneeler; pulpit, lectern, and choir seating; and chancel fittings, all of oak, have been provided. Nearly half of the church is now seated with pitch-pine benches, and the remainder with chairs until pitch-pine seating can be done entirely. The architects were Messrs. Draper and Walter, of Leicester.



## LEGAL INTELLIGENCE.

**A LEEDS BUILDING BY-LAW APPEAL.**—The Lord Chief Justice and Mr. Justice Wills, sitting as a Divisional Court of Queen's Bench, gave judgment last week in the case of Cook v. Hainsworth, it being a case stated by the stipendiary for Leeds on certain questions of law which arose in a matter adjudicated by him. The facts were shortly these:—On December 20th last an information was preferred by Hainsworth, the inspector for new buildings for Leeds (the respondent), against George Cook (the appellant), under by-law No. 61 of the by-laws with respect to new streets and buildings in Leeds, on the ground that the appellant did, on September 21st, 1895, unlawfully erect a house and shops in the Otley-road and Wood-lane, Headingley, without having the plans approved by the corporation of Leeds, as required by by-law No. 61. The learned stipendiary convicted the appellant, and fined him £3, including costs. The Lord Chief Justice, in giving judgment, said that the case raised a point, no doubt, of considerable public importance; but the real question in the case was whether the by-law in question was valid or not. His lordship then, in the course of an elaborate judgment, referred to the facts and the statutes from which the power to make the by-law was derived, and said that he came to the conclusion that the by-law was valid, and not unreasonable. He thought that the magistrate had come to a proper decision, and that the appeal ought to be dismissed. Mr. Justice Wills concurred.

**BUILDER'S APPLICATION FOR ANNULLMENT OF BANKRUPTCY.**—Before his Honour, Judge Bagshawe, Q.C., at the Brentford Bankruptcy Court, on Friday, William Randall Lacey, formerly in business as a builder and contractor, applied for an annulment of bankruptcy on the ground that he had paid his creditors in full. Mr. Watt, barrister, in support of the application, said the debts under the bankruptcy amounted to £800, and he had receipts from the creditors showing that in one case the debt had been satisfied by work done and in other cases by cash. There were only five creditors. Mr. Mercer, the Official Receiver, said the debtor had previously been bankrupt in the Greenwich County Court in 1892, and there was no evidence that he had obtained his discharge or an annulment of his bankruptcy in that case. There was also a bankruptcy in the Chelmsford County Court as to which he had not obtained his discharge. It was the rule of the Court that a debtor could not apply for his discharge if he was undischarged in a prior bankruptcy. Mr. Watt said a similar application was about to be made in the Greenwich Court. His Honour suggested that the difficulty might be met by all three cases being transferred to the High Court. Mr. Mercer thought that course could not be pursued. His Honour thought that the debts should be paid in each of the three bankruptcies, and then an application could be made to the High Court to annul them all. Mr. Mercer said the condition of annulment must be payment in full of 20s. in the £. He had heard just now that one of the debts had been satisfied by work done. He ought to have fuller particulars of the work done. His Honour said the Greenwich bankruptcy appeared at present to be a bar to the application. Mr. Watt suggested that his Honour might issue an order of annulment subject to proof of the other two bankruptcies being annulled. The debtor went into the witness-box and produced a letter, dated March, 1894, and signed W. R. Barnett, saying he was informed that the matter "*In re the Old Hat, Ealing Dean*," had been settled and the contract was therefore at an end, and he had no claim against the debtor's estate, and wished to withdraw the proof. The letter was addressed to the Official Receiver; but, although purporting to have been written two years ago, the Official Receiver said that was the first time he had seen it. Barnett was now a bankrupt in that Court, a receiving order having been granted in October, 1893. None of the other letters withdrawing proofs, Mr. Mercer submitted, complied with the requirements of the Act that debts should be paid in full. His Honour adjourned the application till next Court day, and ordered the debtor to file, within 14 days, an affidavit showing the consideration for each of the debts.

**IN RE A. AND J. W. REED.**—A meeting was held, on May 15, for the public examination of these debtors, builders and contractors, of Stratford. The bankrupts applied to pass upon accounts showing gross debts £7,900 12s. 3d., of which £6,009 9s. 9d. is unsecured, and assets £4,065 11s. 9d. Examined by Mr. Hough, Official Receiver, the bankrupt Alfred Reed stated that during the past three years the firm had been engaged on contracts for building three schools—viz., one in Drew-road, Silvertown, for the London School Board, and one in Deal-street, and one in the New City-road, West Ham, for the West Ham School Board. The total amount of the contract price was £55,600. The two first contracts had been completed, and had resulted in a loss of £2,900. Owing to the action of the clerk of the works, he made a loss of £1,700 over the Deal-street contract. The £1,200 loss over the Drew-road contract was mainly caused owing to the

heavy cost of pumping whilst laying the foundations. They had had to go down 21ft., and the Albert Docks being on one side and the River Thames on the other, the water was continually breaking in. The estimated profit on the New City-road contract, if completed, was £750. The creditors had accepted a scheme of arrangement providing for the payment of a composition of 7s. 6d. in the £ secured. The other debtor having agreed to his partner's answers, the public examination was ordered to be concluded.

**CEMENT MANUFACTURERS v. BUILDER.**—His Honour Judge Edge was occupied for a considerable time at Plymouth County-court, on Thursday last week, in hearing an action remitted from the High Court. Francis and Co., cement manufacturers, sued Albert N. Coles, builder, for £47, value of cement. The original claim was for £84, but judgment for £37 was entered in the High Court, the balance (£47) being counter-claimed as damages in respect of "hot" cement. Mr. Eric Ward for plaintiffs, Mr. J. W. Bickle for defendant. Witnesses were called to prove that, owing to plastering on various houses "blowing," the work had to be done over again. Mr. Corderoy, C.E. (Corderoy and Selby), estimated the damage at £47. The defence was that the failure was due to the use of an insufficient quantity of cement. Judgment for plaintiffs for £47, and £20 was awarded defendant on the counterclaim.

## CHIPS.

To obtain deeper water and provide more quays accommodation, the Harbour Commissioners of Anstruther have decided to employ Messrs. Stevenson, C.E., Edinburgh, to draw out specifications for the deepening and levelling of the inner and outer harbours, and to utilise the sand and mud taken out of the basin in the broadening of the west quay, at a cost of £2,000.

Lord Sackville Cecil, who is the largest ground landlord of St. Margaret's Bay, to the north of Dover, is about to bring the quiet and picturesque old hamlet more into line with the requirements of the modern seaside resort. An estate of over 100 acres has already been surveyed and mapped out, with a view to building seaside residences and bungalows.

Christ Church, North Brixton, an ugly and dilapidated pseudo-Classic structure, is about to be rebuilt from plans by Mr. A. Beresford Pite, F.A.A., A.R.I.B.A. The outlay, including the purchase of an adjoining house, 96, Brixton-road, is estimated at £16,000, which has yet to be raised.

The Mayor of Wolverhampton has issued an appeal for a fund to obtain a memorial to the late Rev. Prebendary Jeffcock, formerly rector. It is proposed to erect a new clock in the tower of St. Peter's Collegiate Church, in place of the present one, which was erected in 1826. The order for the new clock has already been given to Messrs. Smith and Sons, Derby, and will cost £180. It will include Cambridge quarter chimes; the hours will be struck on a large bell with an 80lb. hammer.

The urban district council for Romford have under consideration a scheme for the provision of public offices on a site in South-street, having a frontage of 175ft., and a depth varying from 175ft. to 230ft. It is proposed to expend about £10,000 on public buildings and surveyors' offices, and to reserve an area for the erection at some future time of public baths and a free library.

The parish church of Duffield is about to be restored from plans by Mr. J. Oldrid Scott, F.S.A., at an estimated cost of £4,000, of which one-half is promised by the Heywood family, who will also fill the east window with stained glass from a design by Mr. C. E. Kempe.

New county police offices have just been opened in Northumberland-street, Blyth. They are three stories in height, and are built of brick with stone and terracotta dressings. The style is 14th century civic Gothic. The principal apartment is the courthouse, 48ft. by 28ft. The contract price for the work was £12,000, and it has been carried out by Mr. S. D. Burton, of Newcastle, from the plans and specifications of the county architect, Mr. John Cresswell, M.I.C.E. Mr. Thomas Davison, of Cramlington, supervised the details as clerk of works.

The Shrewsbury Town Council have accepted a tender of Mr. G. Law, of Kidderminster, for £22,978, for the laying of mains for the new sewerage works, which are to be carried out from plans of Messrs. J. Taylor and Santo Crimp, at a cost of about £70,000.

The City Court of Common Council decided at their last meeting to expend a further sum of £2,000 on repairs and alterations to the Freeman's Orphan School and the London and Rogers' Almshouses in Ferndale-road, Brixton, a suggestion that the land on which the buildings are erected, some 8½ acres in extent, should be sold, and the institutions removed into the country, meeting with no support.

## STATUES, MEMORIALS, &amp;c.

**EDINBURGH.**—The statue to John Knox, which has been placed within the quadrangle of the Free Church College, was unveiled on Thursday last week. The figure, colossal in size, is of bronze, and the work of Mr. John Hutchinson, R.S.A., who modelled it *con amore* four or five years ago as a relief from more pressing commissions, and embodied in it his ideal of the character of the great Reformer. The head has been copied from the Beza likeness, and from an engraving of it by Hondius. He wears a scholar's cap, and the long flowing beard falls upon the breast. The chief drapery is the Geneva gown. The left hand holds to the body a large Bible, and the right hand is uplifted, head high. The pedestal, designed by Mr. Hutchinson, and executed by Messrs. Thomson and Son, Dalrymple, Edinburgh, is of red stone. It has a simple base and moulded surbase, die and cornice, all of a Gothic character to correspond with the architecture of the College. On the die is cut the inscription:—"John Knox, 1505-1572. Erected by Scotsmen who are mindful of the benefits conferred by John Knox on their native land, 1896."

The town council of Wrexham decided on Tuesday to purchase an additional piece of land adjoining the site already acquired for public baths, and that competitive designs be invited for the baths, the cost not to exceed £3,000, premiums of £40 and £20 to be given for the designs considered by the council to be first and second in order of merit.

At Searcroft new schools, York, a large four-dialled illuminated turret clock, with automatic gas apparatus, compensation pendulum, and all the latest improvements inserted, and striking the hours upon a large bell, has been erected, the work having been carried out by Messrs. W. Potts and sons, clock manufacturers, of Leeds and Newcastle-on-Tyne.

A new pulpit has lately been erected in Hemingby Church, Lincolnshire, in memory of the late rector, and presented by his children. The base has been worked from Ancaster stone, the upper part being of oak, richly carved, and containing delicate label-moulded tracery panels, surmounted by running carved frieze and cornice after the Flamboyant period. Mr. W. Scorer, A.R.I.B.A., prepared the plans, intrusting the work to Messrs. M. Tuttle and Sons, architectural carvers, Lincoln.

The result of the appeal of the rector of Dedham, on the Essex bank of the River Stour, for aid in restoring the tower of the fine Perpendicular parish church, has been that he has as yet received £442. The work is now in progress. The whole of the old roof has been removed; the main timbers, those used when the tower was built, were in a far more dangerous condition than was imagined, and in truth were only kept in their places by additional templates and bracings, which had also decayed; the lead covering was completely worn out. The new roof is of oak and of stronger construction than that of the old roof, which was of the simple tie-beam type of the period. Other repairs to the masonry and flint work are now being carried out, and all the work is being executed by village workmen. From £100 to £150 more than is in hand is asked for to complete the work.

Colonel C. H. Luard, R.E., held an inquiry on Tuesday, at the Castle of Exeter, into the matter of the applications made by the Devon County Council to the Local Government Board for consent to the borrowing of sums amounting to £70,235 for purposes connected with the enlargement of the county lunatic asylum, and sums amounting to £13,200 for the provision of police stations at Bideford, Paignton, St. Thomas, and Parracombe. Mr. E. H. Harbottle, county surveyor, gave evidence and produced the plans.

The Archaeological and Architectural Society of Durham and Northumberland held their first general meeting of the session on Friday, when the members paid a visit to Hartlepool and district. The members first visited Greatham, where the parish church contains good Late 12th Century work. Elswick was next visited, the church there possessing many features of great interest. At Hart were to be seen the remains of the pre-Conquest church in the original chancel arch and part of the north wall of the nave. The church of St. Hilda, Hartlepool, was also visited.

The West Suffolk villages of Stowupland and Combs have a sewerage problem to contend with, and the East Stow rural district council propose to carry out a scheme which shall relieve those parishes of a difficulty. The sanction of the Local Government Board for the borrowing of £5,000 was asked, and as a preliminary to that being granted, one of its inspectors, Colonel J. O. Hasted, R.E., held an inquiry in the Court House, Stowmarket, last week, when evidence was given as to the proposals by Mr. Midgeley Taylor, of the firm of Messrs. Taylor and Santo Crimp, civil engineers, London.



### WATER SUPPLY AND SANITARY MATTERS.

**COWLYD.**—The undertaking for the supply of water to Conway and Colwyn Bay is practically completed, as on Tuesday the water was turned on from the lake, which is embosomed in the mountains above Llanrwst. The engineer is Mr. T. B. Farrington, C.E., Conway, and the works, which have been executed at an approximate cost of £40,000, have been carried out by Mr. T. Bugbird, contractor, Carnarvon. The pipe-line is seventeen miles. The Conway supply is carried over the river by a suspension bridge, said to be the first of its kind constructed in England.

**LEEDS.**—The Local Government Board have issued a provisional order for confirming an improvement scheme under Part I. of the Housing of the Working Classes Act, 1890, which will enable the Leeds Corporation to deal with the York-street insanitary area. The area included in the scheme comprises 78,415 square yards, and is bounded by Dyer-street, St. Peter's-street, and High-street, thence to the south-westerly corner of the Good Shepherd Mission Chapel, and thence by Stainburn-street, York-street, along Marsh-lane, Kirkgate, Harper-street, the south-easterly side of Millgarth Mills and Lady Beck to the point of commencement. Mr. Thomas Hewson, the city engineer, estimated the cost of acquiring the lands and buildings at the sum of £129,185. He added £36,259 for the alterations to and formation of streets in and abutting thereon, making a total of £165,444. From this a deduction is made of £58,473, the estimated value of surplus land, leaving £106,971 as the net cost of the whole scheme.

### CHIPS.

From Paris the deaths are announced of the historical painter, Pierre Lehoux, and of M. Henri Barbet de Jouy, one of the French authorities on Italian Renaissance art, and the author of catalogues of the Louvre.

Honorary degrees of D.C.L. will, at the ensuing Encenia of Oxford University, on June 24, be conferred on Sir Archibald Geikie and Mr. W. B. Richmond, R.A., formerly Glaid Professor of Fine Arts in the University.

The foundation-stone of the new grammar school being erected at Crossflat, Paisley, at a cost, including site, of £30,000, was laid on Monday by Sir William Dunn, Bart., M.P., chairman of the trustees of the late Mr. W. B. Barbour, M.P., from whose legacy they granted £15,000 to the building fund.

At the first meeting of the members of the Cabinet Picture Society, the following officers were elected for 1896—viz., president, Mr. J. L. Pickering; vice-president, Mr. Carlton A. Smith, R.I.; council, Messrs. Almond, Wilfrid Ball, R.P.E., Bundy, R.I., Clifford, Val Davis, Farquharson, Kinsley, Sheridan Knowles, R.I., Coutts Michie, A.R.S.A., Scott, R.I., Weedon, R.I., and Terrick Williams.

The Lord Mayor will, on Saturday, June 20, being the fifty-ninth anniversary of Her Majesty's accession, unveil, in the interior court of the Royal Exchange, a marble statue of the Queen by Mr. Hamo Thornycroft, R.A., which will replace a statue of inferior merit on the same spot. Her Majesty opened the Royal Exchange in 1844.

A new infirmary is in course of erection at Whiston, near St. Helen's, Lancs. The contractor is Mr. Frederick Brown, of St. Helen's.

Mr. G. B. Smallpeice sold at Woking last week 17 plots of freehold building land on the Hill View Estate for a total of £4,130, which shows an average price of £1,000 an acre. Twelve or fourteen years ago land in this neighbourhood realised about £200 an acre.

The new church schools in Henry-street, Old Trafford, were opened on Friday evening by the Bishop of Manchester. They have been built from the plans of Mr. John Bowden, of Manchester, upon land which was provided by Sir Humphrey de Trafford at a nominal rental, and will accommodate about 500 children. The cost has been £2,500.

The saw mills of Messrs. Graham and Bennett, situated on the River Derwent, Derby, were totally destroyed by fire on Sunday morning. The firemen were working six hours before the surrounding property was out of danger. The ruins continued smouldering throughout the day. The damage is estimated at £10,000, and is fully insured. The cause of the outbreak is unknown.

Mr. John Johnson, one of the principal building contractors in Leicester, met with a shocking death on Thursday in last week. He was superintending the erection of a large boot factory, and in crossing the scaffolding fell into the basement. He sustained terrible injuries, and died immediately. Two workmen who were employed in the basement had a narrow escape, deceased falling within a few inches of them.

### Our Office Table.

THE Royal Cambrian Academy of Art inaugurated its 14th annual exhibition at Plas Mawr, Conway, on Monday. The new gallery, which was opened in February last, and has been added to the old mansion from the designs of Messrs. Baker and Hughes, London and Bangor, the honorary architects to the academy, has relieved the council of the complaints made at previous exhibitions—that the pictures were crowded, and too often hung in a bad light. The place of honour is given this year to Professor Herkomer's well-known painting "Our Village," which has been exhibited at Burlington House, in Manchester, and elsewhere. Other exhibits of note among the 300 hung are three mountain studies in Snowdonia and Merionethshire by Mr. H. Clarence Whaite, R.W.S., the president of the academy; three landscapes by the vice-president, Mr. Cuthbert C. Grundy; Sir E. Burne Jones's "Wheel of Fortune"; Siamese sketches by Mr. E. A. Norbury; and works by Joseph Knight, Prescot Davies, Parker Hagarty, Ben Fowler, Sheridan Knowles, S. Sidley, F. W. Hayes, and Anderson Hague. The only exhibitors of architectural drawings are Mr. Harold Hughes, A.R.I.B.A., Bangor, and Mr. G. A. Humphreys, M.S.A., Llandudno. The group of statuary designed by the late Mr. John Bell for the American corner of the Albert Memorial, Hyde Park, and presented to the Cambrian Academy by his daughter, Mrs. Hoare, has been placed in one of the courts.

It is satisfactory to learn that the quaint quadrangle in the Mile End-road, known as the Trinity Almshouses, is not to be demolished, as doubtless it would have been if the proposals made by the Corporation of Trinity House in August last had been sanctioned by the Charity Commissioners. The latter have just addressed a letter to the corporation, stating that, after carefully considering the case, they do not think the abolition of the almshouses would be justified. They have been guided to a considerable extent by Mr. Justice Chitty's judgment in the case of the Emanuel Hospital, Westminster, which concurred with other judgments in laying down as a general rule that almshouses should only be abolished when they were insufficiently endowed, or when they failed to accomplish their objects. Neither of these conditions seems to the Commissioners to be satisfied in the present case, though they are willing that the fourteen houses at the extreme north of the site appropriated to Griggs's almshouses should be removed. A rebuilding and repair fund is to be created, and the various trusts now controlling the group of buildings are to be consolidated into one governing body.

THE REV. SIR BORRADAILE SAVORY, Bart., the rector of the Church of St. Bartholomew-the-Great, E.C., pleads for £700 to complete the restoration of this, the oldest church in London. The work of repair was, he remarks, begun in 1866, and after a period of 20 years was again taken up, and is still in progress, Mr. Aston Webb, F.S.A., being the present architect. During the last ten years, by the large gifts of few and the small gifts of many, £32,000 has been raised and expended. Houses round the church have been bought, land has been redeemed, extensive works have been carried out, and thus all the desecrations of former years are now no more. The fringe factory over the altar, the school in the triforium, the vestry in one transept, and the blacksmith's forge in the other, are all things of the past. But £1,300 is now needed to finish the work. One member of the committee offers £300, and the rector will give the same, trusting that the remaining £700 will be forthcoming before the end of this year. The rector has promised to conduct the members of St. Paul's Ecclesiological Society over the church to-morrow (Saturday) afternoon.

ALTHOUGH the parishioners of St. Michael's, in the city of St. Alban's, have unanimously resolved to allow Lord Grimthorpe to restore and rebuild the tower of the parish church from his own plans and at his own cost, some protests are being raised in the local papers against the free hand accorded to the "restorer" of the Abbey. Mr. F. G. Kitton, a well-known artist, has written strongly on the matter, and Mr. A. Whitford Anderson, A.R.I.B.A., of Watford, says:—"The tower of St. Michael's, with its grey walls and quaint

weather-beaten brick buttress, is—though not architecturally the finest—perhaps the most picturesque bit of old colour in the county. Surely St. Alban's has more spirit than to submit to a single domineering personality, and allow the treasures, of which she is the custodian—the nation's heritage—to be destroyed, one by one, at the caprice of an individual. If the tower be ruinous, for Heaven's sake look to it yourselves, and intrust the work to men who would deal lovingly and tenderly with it."

DEAN FARRAR's fund for the restoration of Canterbury Cathedral now amounts to £8,600, and the similar fund organised by Dean Stephen for the repair of the nave roof of Winchester Cathedral to £7,200. This being ample for the works to the roof, other improvements are in contemplation at Winchester, at a further cost of £6,500. These include the completion of the great reredos by the addition of the central figure, for which a design is being prepared by Messrs. Bodley and Garner, the restoration of the Lady-chapel, and the improvement of the organ. The restoration of the Lady-chapel will include the repair of the Purbeck marble pavement, which is in a most dilapidated condition, and the filling of the three great windows with stained glass, for which designs are being prepared by Mr. C. E. Kempe. The southern window of the three will be a memorial to the late Bishop Thorold, being immediately over his grave. For this window £360 have already been subscribed, but the total cost of each window will be £550. The improvement of the organ will consist mainly in the introduction of new mechanism, including an arrangement for enabling the player to accompany singing in the nave as easily as in the choir.

UNDER the auspices of the City and Guilds of London Institute for the Advancement of Technical Education, an exhibition of specimens of practical work was opened on Wednesday by Sir Frederick Abel at the Imperial Institute. The institute has now about 300 centres of instruction all over the country, and this year something like 15,000 students competed in the various classes, with the result that several hundred specimens of their handiwork were selected for the purpose of exhibition at South Kensington. The departments into which the exhibition is divided include plumbing, carpentry and joinery, artistic plastering, such as sgraffito and imitation mosaic, cabinet work, mechanical engineering, copper-plate etching, and other trades. Prizes are offered, ranging from £10 in the honours class of each department down to smaller sums. The mechanical engineering class is divided into four sections—machine designing, turners' work, fitters' work, and pattern making. The exhibition will remain open each day between the hours of 2 p.m. and 7 p.m. until Thursday evening next.

THERE seems every probability of the brick-making industry in the immediate neighbourhood of Peterborough undergoing a considerable extension. The Fletton Brick Company are making considerable alterations to their means of output, and other land in the locality is being brought into the market for brickmaking purposes. On Saturday, at the Great Northern Hotel, Peterborough, Messrs. Fox and Vergette offered for sale an estate of 88 acres, situate in the midst of the Fletton and Yaxley brickfield. The particulars of sale gave some particulars respecting the growth of the brickmaking industry at Peterborough. From a small concern, giving employment to perhaps twenty hands, the brickyards have developed into a great centre of activity, in which there are sixteen large Hoffman kilns, and fully as many Dutch, Suffolk, and other kilns at work, turning out every year bricks enough to build a very decent-sized town, and employing hundreds of men; one railway alone carrying about a quarter-of-a-million tons a year. The bed of workable clay extends along the line of the Great Northern Railway for about two miles, and the brickmakers of the district have bought up the greater part of the land having a railway frontage. The pressed bricks were said by the vendors to be general favourites in the trade, because of their cheapness, soundness, evenness of size and quality, their sharp and well defined arris, and their suitability for heavy work. They have, when tested, withstood a pressure of nearly 200 tons per square foot. It has been claimed for them that "they are cheaper and better than stocks, taking less labour, less mortar, and at the same time making stronger work, with



greater resistance to fire and water." The great factor in their success is the cheapness of the method of manufacture. The clay is of a dry nature, the "knots" being dug from the bank, carried straight to the pans, ground, pressed into bricks, and stacked in the kiln, all in the course of a few minutes. The raw material is very clean, and easily worked, and, not being gritty, the wear and tear of machinery is a small item. The remarks of Mr. Ellis Marsland, hon. sec., at a recent meeting of the Society of Architects, on bricks and brickmaking at Peterborough, were quoted. In the course of the sinking of trial holes on the land offered for sale, another substance differing from the clay—and of its ultimate commercial value there is considerable speculation—was found in large quantity. It resembles in some points a very fine clay, and one expert has given it as his opinion that it would stand immense heat, whilst another expert has hinted that it might possibly be used in the process of finishing cloth. The competition for the lots was spirited, the top figure being at the rate of £204 per acre. It is said to be the highest price publicly given for brick clay land in the locality.

The workmen who have for the last seven years been making excavations on the site of the Roman city of Calleva, on the estate of the Duke of Wellington at Silchester, have during this month opened up several additional buildings, one of them with a hypocaust showing some unusual features, whilst others seemed to have been used as dyers' workshops. One or two specimens of Samian ware are amongst the latest "finds" in the ruins. They have been removed to Silchester Museum at Reading, established specially for the reception of antiquities discovered in the course of the excavations. The most important of these was an earthenware pot containing 253 silver denarii, ranging in date from B.C. 40 to A.D. 211, though there have been also many objects in gold, bronze, metal, bone, and glass, much pottery, and a fine slab of Purbeck marble.

With a view to obtaining information that may be useful to them in the contemplated change by the Leeds Gas Committee in the working of their pipe-laying department, a deputation from that committee, accompanied by Mr. Townsley, the superintendent of the gas department, visited, on Friday, Birmingham, in which city the pipe-laying is let out to contractors. The deputation were met by the secretary of the Birmingham Gas Department (Mr. E. Smith), who explained that until January, 1886, the Birmingham Corporation did their pipe-laying themselves; but since that time they had let the work to contractors. The cost per yard of pipe-laying was now a trifle more than when in the hands of the corporation, yet, taking the year all round, the total cost was less, as under the old system, it was stated, work had to be found for the men in the summer months, when there was little in hand. The deputation were further informed that the letting of the pipe-laying to contractors was much preferred by the Birmingham Corporation to doing the work themselves. The leakage in 1876 was 10 per cent., whilst in 1885, when done by contract, it was only 6½ per cent. Only one accident had occurred since the contractors took the matter in hand. The Birmingham Corporation provided all material to the contractors such as pipes, tubes, leading, packing, &c. The Leeds deputation appeared favourably impressed with the system in vogue in Birmingham.

The 18th annual Ecclesiastical and Educational Art Exhibition, in connection with this year's Church Congress, will be held in a large iron building to be specially erected for the purpose in the Quarry, Shrewsbury. It will be open from October 5 to 9. The exhibits will include articles of every description used in the services of the Church, and in the fitting, decoration, and embellishment of churches, including stained-glass windows. Offers of loans of old plate, embroidery, wood and ivory carvings, paintings, old manuscripts and books, and articles of archaeological interest, should be addressed to the manager, Mr. John Hart, Maltravers House, Arundel-street, Strand, London.

The *Engineering Record* comments on a new building ordinance for Newark, N.J. Newark is a large city, and called for a very perfect system of building law; but our contemporary says: "If it had been the design of the framers of the law to enact regulations to facilitate the violation of about every principle of good struc-

tural practice, such a purpose could scarcely be better served than by the proposed ordinance." It is said there are no definitions of terms, and that corresponding indefiniteness results. No specification of the various kinds of material to be used is given. Working loads and stresses are prescribed for cement and mortar, concrete, masonry, iron, and steel, but nothing is said of the physical and other qualities necessary. It is prescribed that structural members should be designed by the rules laid down in "Haswell's" or "Trautwine's" or "other well-known engineers' pocket-books"! Surely our contemporary has exaggerated. We can hardly imagine a common council of so important a city can have officially recognised any pocket-book rules or formulae, and have prescribed certain values and constants for calculation for the use of builders. These cut-and-dried rules cannot but lead to failure and to all kinds of guesses.

#### MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—St. Paul's Ecclesiastical Society. Visit to the Church of St. Bartholomew the Great, Smithfield, and the Church of the Holy Redeemer, Clerkenwell. 3 p.m.

MONDAY.—Surveyors' Institution. Annual Meeting. 3 p.m.

Society of Engineers. "Railway Bridges for Branch Lines," by M. A. Pollard Urquhart, M.Inst.C.E., Royal United Service Institution. 7.30 p.m.

TUESDAY.—Institution of Civil Engineers. Annual Meeting of Members. 8 p.m.

WEDNESDAY.—British Archaeological Association. "The Fitzwilliam Virginal Book," by J. A. Fuller Maitland. 4 p.m.

Art for Schools Association. Annual Meeting at 29, Queen's-square, Bloomsbury. 5 p.m.

Glasgow Architectural Association. "The Designing of Wall Papers," by Alexander Orr.

SATURDAY.—Edinburgh Architectural Association. Visit to Falkland Palace.

The post office in the Market-place, Willenhall, is about to be enlarged from plans prepared by Mr. J. P. Baker, of that town.

On Saturday morning, an old building in Castle-street, Warwick, which was being converted into a friendly societies' hall, collapsed while men in the employ of Mr. Tallis, a local contractor, were at work on the structure. The roof and chimney-stack fell in, and the outer walls of the upper story gave way under the strain. A young fellow named Charles Oldham was thrown from the scaffolding, sustaining a shock and severe contusions. At the same time another man named Joseph Robbins, who was engaged on the roof, fell, and had a scalp-wound inflicted. The accident, which will practically involve the rebuilding of the premises, was caused by an old chimney stack giving way.

By permission of the proprietor, Colonel Home Drummond, excavations have begun on an extensive scale at the famous Roman camp at Ardoch, Perthshire, said to be the most perfect specimen of Roman remains in Britain. The excavations are being undertaken by the Scottish Archaeological Society. The Ardoch camp is really virgin soil, as all access to it has hitherto been refused. Work was begun last week, and already a number of fragments of Roman pottery have been found. The work will be continued throughout the summer.

The Roman Catholics of Blackburn have resolved to rebuild their Church of St. Anne's, at a cost of £10,000.

The Duchess of Teck will open, on a date in July, the new infirmary which has been erected for the Brentford Union at a cost of £30,000.

The city council of Birmingham have under consideration a report by Mr. Addie, the surveyor of the Improvement Scheme Department, recommending that the whole of the wooden floors in the Town Hall be reconstructed, as they are so worn as to be in places really dangerous.

Mr. Francis Rudall, who for many years was the telegraphic engineer to the London, Chatham, and Dover Railway, died on Tuesday week, at the age of 69, at his residence, St. Lawrence, Thicket-road, Anerley.

The opening of the Dublin electrical tramway appears to have been a great success. The trolley system has been adopted. The whole track is 17 miles in length, and the 4d. through fare is at the rate of less than a halfpenny a mile.

A destructive fire occurred on Friday at the works of Messrs. J. Boys and Sons, timber merchants, and railway contractors, the Pleck, Walsall. A large building containing valuable machinery and a huge stack of wood prepared for the machines were destroyed, the loss being estimated at from £7,000 to £10,000. About 120 people were thrown out of employment.

## Trade News.

### WAGES MOVEMENTS.

THE STRIKE IN THE LONDON BUILDING TRADES.—The dispute between the carpenters and joiners and the London Association of Master Builders has shown increasing signs throughout this week of an amicable settlement in favour of the men, reports coming to hand each day of fresh masters who have conceded the point in controversy. Up to yesterday (Thursday) afternoon 143 masters had yielded, including two members of the Central Association. The official statement issued on Wednesday night by the strike committee of the Amalgamated Society of Carpenters and Joiners, reports that "two-thirds of the carpenters and joiners of the Metropolis are now at work under the new arrangement, making a total of 10,000 of the 15,000 affected by the strike who are now in employment at an increase of ½d. per hour, and under the revised code of working rules. Between 2,000 and 3,000 members of the kindred Societies of Carpenters and Joiners and 2,500 non-unionists are still out on strike. The latest returns to hand of the men remaining idle through the dispute are as follows: Carpenters and joiners (unionists and non-unionists), 5,000; general builders' labourers, 4,800; plasterers, 2,500; bricklayers (locked out), 1,500; engine drivers and crane drivers, 350." The final ballot was to be taken last Thursday night, at 120 meetings of the carpenters and joiners, to be held in various parts of the Metropolis, with reference to the rule submitted at the Conference between representatives of the Standing Committee on Trade Questions of the Central Master Builders' Association and the officials of the Amalgamated Society of Carpenters and Joiners as an alternative proposal. All the men were also to ballot with regard to the proposal "that any agreement arrived at shall terminate at six months' notice from either side." The results of the voting on these questions were not, however, known when we went to press. The Federated Labourers' Council have issued a manifesto to the 6,000 builders' labourers on strike, urging them not to accept the ½d. advance offered, but to stand out for the full ½d. conceded to the more highly-paid workmen. The executive of the Amalgamated Society of Carpenters and Joiners, at a meeting held on Wednesday, Mr. J. Coulthead, chairman, presiding, decided to recommend to the men the acceptance of the "disability" clause in the modified form last agreed on in conference with the masters' representatives. At a meeting of the Camberwell branch of the society, however, a resolution against the acceptance of the new proposal was unanimously carried.

PLUMBERS, AND THE AGREEMENT WITH THE MASTER BUILDERS.—At a specially summoned meeting of the West Central Lodge of the United Operative Plumbers' Association, held on Thursday, the 21st inst., to take into consideration the agreement arrived at between the Central Master Builders' Association and the delegates of the Plumbers' Society, Mr. E. Weymouth, president, in the chair, it was unanimously resolved to repudiate the agreement, and to strongly censure the committee and the delegates for arrogating to themselves the right and powers of the lodges. The resolution also called upon the executive council to take a ballot vote of the London men for and against the agreement becoming recognised as a settlement of the dispute.

ABERDEEN.—Professor Dove Wilson, to whom the dispute was referred, has awarded the operative masons and stonecutters an advance of ½d. on their wages. The increase asked was from 7½d. to 8½d., and the new rate is thus 8d. per hour, the arbitrator considering that the rate of wages current, and the state of trade in Aberdeen, warranted the increase.

BELFAST.—A strike has occurred among the Belfast workmen in the upholstering trade, which is expected to continue for some time, as the men are determined not to return to work until their demands are granted. About four years ago the upholsterers got an increase of 2s. per week, and they are now wanting another rise of 2s. per week. The masters have offered 1s. per week, but this has been refused. The cabinet-makers, who, if the dispute continues, will probably be affected, have within the past two years got increases.

LEEDS.—The strike in the Leeds building trade is not expected to continue much longer, a dozen more employers having intimated that they are willing to accede to the men's requests. These firms accordingly recommended on Tuesday. It is believed other firms will also give way soon, as some important contracts are at a standstill.

Reopening services have been held at St. Andrew's Church, Montpellier, Bristol, after re-seating and other works of internal restoration. The alterations have been carried out by Messrs. Hatherley and Carr, under the superintendence of the architect, Mr. Bevan, all of Bristol.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### SOME RESULTS OF THE NEW LOCOMOTION.

MORE than 100 years ago, one of his friends told Dr. Johnson that some ingenious person had just invented a machine which he worked by his feet, and which took him along the roads faster than he could walk. "Then, Sir," replied the grand old Philistine, "the man has the choice of whether he will only move himself, or whether he will move himself and the machine, too." This, in the view of shallow common sense, settled the matter. Such machines were proved to be absurdities, and for another century nobody took them seriously. The "dandy-horse"—in which the rider kicked against the ground to propel himself, and then lifted his feet till the impulse was exhausted—was only a plaything for children. The velocipede, as it existed 30 or 40 years ago, was but a more respectable substitute for the treadmill. Even the modern tricycle has been accused of similar affinities. An Essex magistrate, who patronises this safe, but comparatively slow, contrivance was laboriously working his way up a hill in the neighbourhood of Woodford. A man whom he had sentenced to two months' hard labour had that day been discharged from prison, and meeting his former judge near the middle of the ascent, remarked, "Now I'm off, and you're on." The bicycle, with the latest improvements, has no such unpleasant associations. The defenceless foot-passenger, when he goes in peril of his life from the record-making cyclist, may think that "six weeks' hard" would be the most fitting reward for that person's exertions; but he does not doubt that the cyclist's feelings at the time are altogether agreeable ones.

There is no sign that cycling will stop. People have learned to roll along at a pace of ten or twelve miles an hour, and they will never more be content to trudge at the rate of three or four. Whatever saves time makes life longer, provided always—if the Hibernicism may be allowed—that it does not make it shorter. Accidents, however, do not count for much in face of obvious improvements. The smashing up of an express does not lead to a revival of the old stage-waggon, nor even of the "flying coaches" which left London on a Monday and reached Exeter on the Wednesday afternoon. The latest wheel-machine, in fact, is such a marvellous multiplier of human powers, that men may well ask why Nature never hit on it. In other inventions she has been beforehand with them. They have not even yet devised a boat as scientific as a fish, or a heat-engine as economical as an animal, or a light as free from useless heat-waves as that of the glow-worm or the fire-fly. Yet in the cycle they have shown how the same amount of energy which the body expends in walking might have taken it along on wheels twice or thrice as fast, and the lesson never seems to have been anticipated. Why were not wheels evolved instead of feet, and this not for men only, but for other inhabitants of *terra firma*? They are incomparably simpler in their action than wings, which have arisen over and over again from quite different sources, in the different tribes of insects, birds, and bats. Probably the reason is that wheels require roads, or, at least, smooth land surfaces, and these were few until men made them. Level plains here and there were abundant; but as a rule they were covered with vegetation, and the climates in which they were not so were

climates in which animal life had hard work to maintain itself.

The cycle, then, to all appearance, has come to stay. Legs, or, at least, feet, are partially superseded. And this is not the case with humanity only. As the cycle beats the pedestrian, the auto-car will beat the horse. It will go faster, if the law lets it, and it will increase faster. Thousands of people may keep an auto-car who cannot afford to keep a horse. The machine will only need feeding when it is actually at work. It will not "eat its head off" when it lies idle. Its food, too, is cheap. A shilling's worth of petroleum has more work in it than a shilling's worth of grass, or a shilling's worth of oats. True, it may be said that, as long as the sun shines, and the rain falls, we can go on growing hay, while it is uncertain how long we can go on pumping up petroleum. Well, if petroleum fails, there is electricity to fall back upon, producible, if coal fails too, by winds and tides and waterfalls. But will petroleum fail? If it is only the drainage of old coal fields, or of other organic remains belonging to former geological periods, it must come to an end, like the coal itself. But some chemists conjecture for it a different origin. They think the earth is still manufacturing it, and that we are having it sent up to us as fast as it is made.

There is no doubt that the interior of the globe is intensely heated. Far down, there is good reason to suppose that it largely consists, not of metallic oxides, like the outside crust which we know, but of metals themselves, probably united, as we find them to be in meteorites, with quantities of carbon. Now when water gets access to these metallic carbides, especially while they are at a high temperature, it will decompose them, and be decomposed itself. Its oxygen will unite with the metal, and its hydrogen with the carbon, and the latter combination will supply us with all the mineral oil we are likely to want for unimaginable periods yet to be. If that is the true theory, our auto-car, once started, will not stop running for want of fuel.

But what has all this to do with building matters? More than at first appears; more indeed than it is possible to foresee, even dimly. The wisest man who looked at Stephenson's "Puffing Billy" on its first invention, when the Northumbrian miners thought it half a miracle and half a joke, could not have dreamed of the new cities that would spring up, or the old villages that would die down, from the action of "Puffing Billy's" successors. And no one now can predict with certainty how much old building will become useless, and how much new will be needed, where rolling takes the place of walking and running. The new wave of progress will reach the road surveyor before it touches the architect. The great street-pavement question will have to be reconsidered under new conditions. On this point everything depends on the number of horses that will finally remain in use, and the purposes to which they are put. If the new revolution ends, as it begins, by leaving them in possession of the heavy traffic, the change in paving will perhaps be small. It is heavily-laden horses for whose sake chiefly smooth pavements have been abandoned and spongy or dusty ones borne with. But for them we might abolish macadam and water-carts, as well as wood-paving and insanitary effluvia. Asphalte, or some improvement in asphalte might cover the streets, and noise, and dust, and dirt become mere trifles.

A noiseless pavement, however, has its dangers, especially if it is going to be traversed by indiarubber wheels in unprecedented numbers, and at an unaccustomed speed. The cyclist, according to present orders, ought to ring his bell whenever he approaches a foot-passenger on the roadway.

This is all very well in the country; but in towns it means that the bell must never cease, and that bells would be going in so many places at once as to be a perplexity instead of a protection. One safeguard that commends itself to the out-of-date pedestrian is to keep cyclists out of crowded streets altogether. But is this, or will it long be, practicable? We must remember that there is not only the cyclist for amusement to be dealt with, but the cyclist for economy. Workmen living in the suburbs go to work, and clerks and others go to business on their bicycles—partly, perhaps, for the pleasure of the ride, but partly also because they think it cheaper than the railway. Naturally they go fast to save time, and inevitably they have to go where the streets are busy. The police might find it possible to insist that where the traffic is most congested the machines should be led and not ridden; but such a rule could only be carried out in a few exceptional thoroughfares. Little could be done, too, to lessen the risk from the auto-car, which, we may be pretty sure, will not long be satisfied to lag behind the bicycle. People are getting used to going fast, and they will more and more insist on it. Just as the electric light has set up a standard of brightness which other modes of illumination are learning very closely to rival, so the bicycle has set up a standard of velocity which other street traffic will more and more nearly approach. The prospect is that the roads will be much fuller of vehicles going much faster than now. It is a poor prospect for the despised foot-passenger, and no doubt he and his like will be killed in numbers before anything effectual is done for them. It is our way in England, and until the bishop, whom Sydney Smith desiderated, has been slaughtered to draw attention to the danger, the risk will be thought imaginary. Till then, the chief security of the public lies in this, that to smash a man is to spoil a wheel. Sooner or later, therefore, even if the pedestrian is not listened to, the cyclist will be, for when the novelty of the thing has worn off, he will grudge the cost of refitting his engine of destruction after every collision.

There is no knowing what all this may finally lead to. But at the first glance there seem two alternatives at a crowded crossing—foot-bridges for the pedestrian, or subways for the cyclist. If the latter were tried, the gradients, of course, must be easy. Subways have often been proposed for foot-passengers at dangerous places, like the front of the Mansion House; but there have been serious objections to them. They might become mere loitering-places for idlers, roughs, and bad characters in general. This, however, would not happen if they were passage-ways for the cyclist. Nobody else would then venture there, unless by chance some countryman as daring or as ignorant as that one who, being in Gower-street Station, asked a porter the position of Portland-road, and then coolly set out to walk there through the tunnel. The subways would, in the sanitarian's language, be self-cleansing, as far as roughs and loiterers were concerned. But the approaches would take up much valuable road space, and, after all, subways would not save the pedestrian from destruction by auto-car. In England, we do not yet realise what this is. In America it is beginning to rank with consumption, diphtheria, and other well-established headings in the bills of mortality.

On the whole, therefore, street bridges seem to be what the new locomotion is sure to lead to. It will depend on their designers whether they are to be a great beauty or a great eyesore. If they are designed by the average engineer—or by the ironfounder with friends on the Council—they will be abominations which will long postpone every chance of making our cities beautiful. We know the engineering and ironfounding idea of art. It is to leave general forms to chance and mechanical formulas, and then to plaste



over the abortions which have resulted with attempts at ornament even more repulsive than the things they are meant to decorate. Street bridges are not subjects to be left to the road surveyor. They have it in them either to make or mar our towns; but as their authors will generally be appointed by Bumbledom in one or other of its forms, the danger is that they will do more marring than making. The Council or the Corporation which would consider the question in time, and initiate these structures by showing how admirable they might be made, would do a service to the whole kingdom. But if this is too much to expect, surely the Institute might take up the matter in offering its annual prizes. In bygone years the Institute competitors have often been set to work on schemes such as no one ever had seriously proposed, or was likely to propose. A little bit of "actuality," as the French say, would be a welcome change. The conditions could not be too real, or the locality too familiar. A single bridge across the southern part of Gracechurch-street, a double one across Cannon-street and King William-street, or a multiple one over some of the dangerous crossings about Ludgate-circus, Trafalgar-square, or Piccadilly-circus, would each be a thing devoutly to be wished for; and a clever drawing, showing how it could be built in a picturesque way, might before long lead to its actual erection. Our main streets are becoming railways without rails, and level crossings in them will be found more and more intolerable every year.

The new locomotion will surely affect buildings as well as roads. Already there are demands for bicycle-rooms at railway stations and in public buildings, and a Congregational chapel in the South of London seeks to attract the excursionist on wheels by promising to take charge of his machine during sermon-time. Accommodation of this sort will be more and more wanted, and the architect of the future will build fewer stables, and more wheel-rooms. Perhaps some reader's prophetic gaze may look still further, and see the flying machine superseding both the cycle and the auto-car. It is still in the "Puffing Billy" stage—a thing not to be mentioned without a laugh. The time will probably come when it is neither a joke nor a wonder, but an accomplished fact. Yet even then it will depend so much on the variable conditions of the air, that it can hardly be relied on for regular and punctual travelling. It may only provide amusement; but it may also become a military resource of the last importance, and, if so, it may revolutionise, not England only, but the whole world, from the Equator to the Poles.

#### RIVAL CLAIMS AND APPLICATIONS.

IF the Greek architect, Ictinus, or any of our Mediæval builders, like Alan de Walsingham and William of Wykeham, were to visit our 19th-century buildings, they would discover that architecture had changed very materially in its meaning and practice. They would find one class of men engaged professionally in designing shells of stone and brick after ancient models, and another set of craftsmen engaged in furnishing and decorating them upon principles or motives very distinct from those which arose out of structural considerations, or expressed some victory, some festive celebration, religious faith, or historic event. Then it was a spontaneous impulse which gave the theme to the sculptor, painter, and decorative artist over which the architect possessed control. It was a legend, or history, or sculptured relief on wall or frieze, a mosaic representation on wall or vault, a part of the actual architecture; now it is often distinct, self-assertive, and aggressive. Since the separation and isolation of the arts allied to architecture, the thinker and the

worker have, as Ruskin says, pursued their separate ways. All our work bears the impress of the architect's desk or the workman's shop, and it is very hard to say when we enter one of our large commercial or public buildings, where the mind of the architect ceases, when there is so much manufactured "art" stuck on. There are two arts instead of one: the first of the man who designs and thinks, the second of the man who makes a profit. This is one cause of the breach between the old and the new. The Ictinuses and Walsinghams of antiquity had not rival claims to meet. We do not know their commercial buildings—only their national monuments and their temples.

The practical architecture of the day—not that ideal presentation of it which is to be seen in competition exhibitions, the walls of the Royal Academy, or in the architect's office—seems to be passing through an experimental stage. The rival claims set up by various trades, manufactures, commercial and official wants, have to be met and adapted as far as possible. To reject them would be to hinder the progress of art, to deny architecture the power of adapting itself to modern requirements, which it had always possessed. We may trace back some of the changes which have been made in our architecture to two primary causes amongst others—commercial enterprise and security against fire. The factory, the warehouse, and the shop have all been developments within living memory. Our great forefathers knew very little of manufacture or trade as we know it. Their staple industries were few, and were satisfied with simple structures.

Colossal premises for retail trade—such as those to be seen at Bayswater, Tottenham Court-road, Oxford-street, and other parts of London—represent a growth of trade and of commercial activity scarcely conceivable by our forefathers, who were contented with premises on which the shops were confined to the ground story. Again, the demand for the large unimpeded showroom led the way to structural changes of a very radical kind, the support of large areas of flooring on few supports and fully perforated walls. The architect has to boldly face these difficulties, by substituting iron for timber, and by reducing his walls to a series of piers. These two things totally changed the character of buildings of this kind. Now, the large street building of Messrs. Smith and Jones is nothing but a series of superimposed floors resting on iron columns, with an open screen in front. We cannot expect to get much architecture out of such a building—it is merely a nest of floors and posts, and we hand it over to the builder or ironfounder. Commercial enterprise has also introduced other changes and modifications which cannot be made to harmonise with artistic building—plate-glass, metal, and many ingenious contrivances for saving time and labour to customers, such as lifts, cash railways, electrical appliances, &c. These things are all being experimentally or provisionally accepted, but they are not architecturally accepted. The second cause we have mentioned—security against fire—has been a potent one in buildings of the commercial class especially. It has presented to the architect new problems for solution in the use of iron, on which it is needless to touch, and it has replaced some of those materials venerable by age and association, such as timber and stone, by others which are not so adaptable or so suited to artistic impressions, to name no others than the many materials for covering columns, for ceilings, and those inventions in which metal lathing is combined with plaster for constructing partitions, and the combination of steel and concrete for vaults and cupolas.

Other great social movements of the age have also wrought changes and introduced new modes of construction and new applications. We may just mention three of these:

the housing of our population in great cities; the care of the sick; and the great educational impetus. The first has brought with it the erection of dwellings for the working classes; the second, the development of hospital and infirmary construction; and the third, the building of schools, elementary and technical, and free libraries. The travelling facilities of the age have also created colossal hotels, which surpass all previous hostelries of ancient and modern times. These movements have added greatly to the architect's labours, and in addition to the many new problems of plan and construction he is called upon to consider, he has the further and equally important task of settling the rival claims of materials and manufactures, and the application of them. To some of these, the newer substitutes, we may draw attention. Comparing the old with the modern building, the use of wood has undergone a change. In the old building it occupied an important part. Not only floors and roofs, but walls were constructed of it; but since the development of fire-resisting construction and sanitary requirements, it has given place to materials that are incombustible—hard and imperishable substances, like cement, plaster, vitreous materials like tile. We have lost, therefore, the domestic character and comfortable appearance of the wainscoted wall and the oak-framed ceiling. The newer substitutes—plaster and cement, terracotta and tile, marble slabs and painted imitations—have yet a cold and bare look in many of our buildings—there is no attempt to enrich the plaster surfaces by relief or colour. As to the use of plaster in its many new forms, a marked tendency is to extend its application to parts and details that would be better made of some more durable material. Plaster is not only used for coffered ceilings and vaults, but for capitals and entablatures that ought to be of stone or terracotta, and is employed for constructive as well as decorative features. Indeed, we may question whether it is legitimate architecturally to carry down in a cove, as we often see, the beams or ribs of a flat coffered ceiling. Flat relief and ornament of a not very pronounced constructive kind is the proper treatment of plaster and stucco work. The wholesale use of imitative fabrics, embossed leather, linoleum, and other kinds of modern decoration, is equally objectionable. There is a desire to press them into service for internal decoration, to the exclusion of more permanent materials. If the New Englander of a future age should inquire as to what was the decoration of our houses and public buildings of the 19th century, of which he could see few traces, he would find that it consisted largely of veneers of wood, sometimes embossed by pressure; of embossed leather papers and other fabrics, decayed remains of which he could see still adhering in patches on walls and ceilings. Our ceilings and domical roofs he would find had disappeared, but he might be able to detect traces of "cradling" and other means used for plaster-work. As for real honest "decorated construction," he would find very little, but plenty of "constructed decoration" of the sort we have named.

Of late years there has been a general revolt from the older forms of internal construction. Architects are not satisfied with materials and methods adopted in many of our commercial buildings, and this revolution is being carried on in New York and the Western cities. Thus we are told, by a writer in one of the New York magazines, there has been a growing dissatisfaction with the results of fireproof construction in bank buildings. Mr. R. W. Gibson, writing on "Modern Bank Buildings," in the *Engineering Magazine*, says: "The quantity of woodwork usually tolerated in a so-called fireproof bank is absurd and unnecessary . . . . After wooden-framed walls had been rejected,



came the dismissal of wooden-framed floors; now the attack is upon cabinet-work and furniture. The partitions of oak panelling must go; bronze and marble are equally handsome, and do not burn." Wainscotings, window-jambs, screens, clerks' desks, cupboard and drawers are all condemned; an inclosed desk is said to be as good as "an election-day barrel." Even the counter is being reformed. Although the top is still of wood, the supporting framing is proposed to be supplanted by open legs, or when storage is required, by "pedestals of metallic case-work, with all the drawers and cases of steel." Marble, brass, and glass are used for the screens. No doubt these changes will give a more monumental character to bank interiors. There will be little that can burn in them. We have not yet come to metallic storage cases, counters, and screens in our City commercial buildings; steel and bronze do not form any important part in them, though we cannot say that they will not one of these days. But we deal in a variety of other materials, more or less decorative. When will the architect be again the recognised authority in our iron and tile and glass work? At the present time he seems to have very little hand in the design of our grates and mantelpieces, our wall decorations, or our furniture. These things are generally applied according to "taste" or specification. They are practically outside the ordinary architect's work. The committee or the client have a voice in their selection, or the contractor submits a catalogue from which these articles are selected. A very free hand is left to the so-called decorator. Adulterated fabrics on cotton warps, even of the sort Mr. Aldam Heaton describes, are now applied in various ways, not only to our articles of dress, but in our decoration, simply because few people are able to tell the difference between cotton and wool or silk when made up in the fabric. It is the result of being satisfied with the present plan of handing over all these materials to the competitive manufacturer. Were it otherwise, we might again see these woven stuffs, chintzes and damasks and velvets, worthy of their old reputation, and worsted grounds used for printed and stencilled designs. Upon the architect rests the responsibility of directing the taste of the public in all these decorative fabrics and their application.

#### ROYAL ARCHITECTURAL MUSEUM.

THE Duke of Westminster, K.G., presided on Friday last at the annual meeting of the Royal Architectural Museum and Westminster School of Art, when there was a good attendance, among those present being Sir Walter de Souza, L.C.C., Sir Arthur Blomfield, A.R.A., Professor W. Garnett (Education Board of the London County Council), and Messrs. James Brooks, J. Hungerford Pollen, J. P. Seddon, C. Forster Hayward, F.S.A., Walter Carew Cocks, Edwin L. Somers Cocks, Wm. Pain; S. W. Lee, Mount London, and Maurice B. Adams, Hon. Sec. The following report of the council was passed unanimously on the motion of Sir Arthur Blomfield, who spoke warmly of the success and prosperity of the schools:—The council of the Royal Architectural Museum and Westminster School of Art, in presenting their annual report for the year 1895, announce the continued and even increased prosperity of the institution, the balance of income over expenditure having been increased from £406 8s. 7d. at the close of 1894 to £710 13s. 2d. at the close of 1895. This satisfactory condition of the finances is, as before, due to the unexampled success of the School of Art, the fees from which amounted to £1,187 7s. in 1895, as compared with £898 17s. 3d. in 1894, and to the increased grants received from the Technical Education Board of the London County Council and the Science and Art Department. The grants from the Technical Education Board were, in 1894, £380; in 1895, £427; from the Science and Art Department, in 1894, £176; in 1895, £193 16s. In addition to the grant received from the Westminster Free Studentship Trust on

account of free students, a special grant of £100 (mentioned in last year's report) was made by the trustees as the nucleus of a fund for rebuilding or enlarging the Westminster School of Art, and the council have recently voted a like amount as an addition to this fund, and a further sum of £200 to be placed to the credit of a sinking fund, to provide for the renewal of the lease of the museum and other obligations. An opportunity has occurred for the acquirement of premises adjacent to the museum on the south side, and the council are of opinion that if they can obtain adequate assistance from the Technical Education Board of the London County Council and others, it would be desirable to avail themselves of the opportunity for providing additional classrooms for modelling, wood and stone carving, and other art industries, such as metal-work, glazing, &c.; whilst they would at the same time be enabled to free the central hall of the museum from the study of the Antique figure, and to make various alterations which will be of service both to the School of Art and to the museum. The subscriptions to the museum show a slight increase as compared with last year, the amounts being, for 1894, £85 5s.; for 1895, £95 2s.; but this arises from variation in the time at which certain subscriptions were paid rather than from any actual increase in the number of subscribers.

Mr. Brooks, in seconding the adoption of the report, said that when it was considered how limited the subscription list really was—being less than £96—it was really an astounding fact that no less an income than £1,938 12s. 6d. had been earned.

Sir W. de Souza moved the re-election of the Duke of Westminster as president.

Mr. Pollen, in seconding the resolution, said a great deal of the enthusiasm for the architecture of the Middle Ages that was so strong forty or fifty years ago had cooled down, and it was, therefore, all the more to their advantage that they had in their president a nobleman who had taken great interest in the architecture of that period.

The motion was passed unanimously.

The chairman, in reply, said, besides being a devotee of Gothic architecture, he happened to inherit a house built in the most Strawberry-hill Gothic that the world had ever seen, and his labours were for 13 years devoted to endeavouring to turn its very bad Gothic into better and, he hoped, really good modern Gothic. Under the able hands of Mr. Alfred Waterhouse this very difficult task had to a great degree been accomplished. He was glad to find that their institution was in a flourishing state, and that their funds were increasing year by year, mainly through the increase of students' fees. They had worked under very great difficulties of space and accommodation, and it was a matter for wonder as well as satisfaction that so many could be accommodated. If their space could be increased, as the council proposed and hoped, the students would increase in number, additional usefulness and prosperity would be brought to a very valuable institution, and the benefit to be derived from the study of their wonderfully fine collection of casts would be extended over a wider field.

The auditors having been re-elected on the motion of Dr. Garnett, seconded by Mr. Sydney Lee, Mr. Seddon proposed a vote of thanks to the chair. This was seconded by Mr. Maurice B. Adams, who alluded to the grant of £500, which had been promised by the Education Board of the London County Council, towards erecting the new studios on the site adjoining the museum. The speaker recalled the many years during which the work of the museum was carried on under financial difficulties, and now that these troubles had been successfully overcome, the clear line of dutiful ambition would be to extend the usefulness of the institution, rendering its work more architectural, and utilising the magnificent collection of old examples and casts by starting technical art classes in the new studios, towards which he appealed for funds.

The Duke of Westminster acknowledged the vote of thanks, and promised £100 for the extension building fund.

#### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XVIII.

By ERNEST A. E. WOODROW, A.R.I.B.A.

THE King's Building at Stuttgart, which is situated opposite the castle in Königsstrasse, was originally intended by King William to be

erected as a theatre. This project, however, was subsequently abandoned, and in the place of the theatre a concert-hall was erected, of which Figs. 1 and 2 give the ground and first-floor plans.

In order that the building might bring in a larger revenue than could be obtained by simply erecting and sub-letting a concert-hall, the hall has been placed on the first floor, and the entire space of the ground floor is laid out for shops with large café and bourse. There is a colonnade extending the whole length of the building facing Königsstrasse, and some of the shops are situated in this colonnade; the café, restaurant, &c., have also entrances therefrom. In the centre of the building is a short passage with an octagonal hall; this leads at right angles to

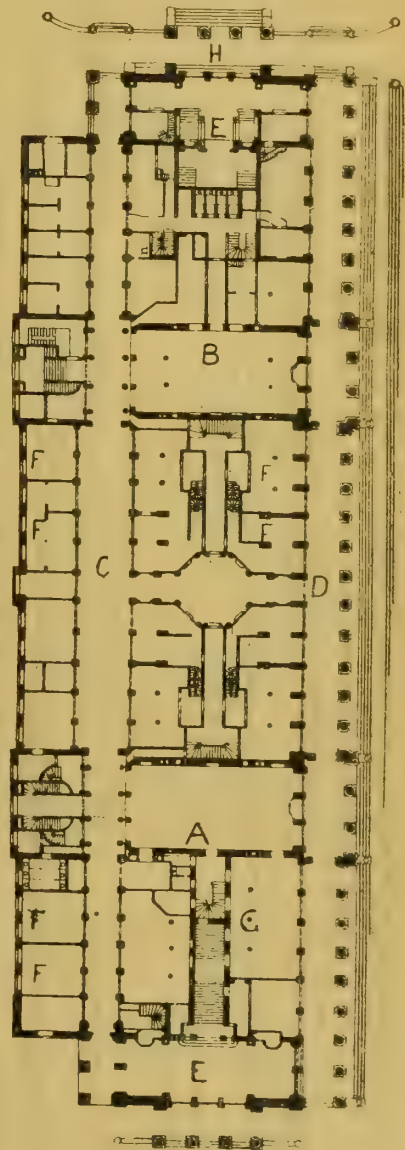


FIG. 1.—A, café restaurant; B, bourse; C, arcade; D, colonnade; E, royal entrance and public entrance; F, shops; G, restaurant; H, carriage-way.

another passage, parallel with the colonnade, extending the whole length of the building, and here, in the form of an arcade, are shops on either side; this passage, or arcade, is roofed in with glass the entire length.

The entrances to the concert-hall are at both ends of the building, where vestibules lead to the main staircases; there are other side entrances and staircases at the back of the café and bourse. The main front entrance and grand staircase lead to the large entrance-hall at the top of two flights of stairs, and from the hall the foyer and crush-room is entered. Beyond this is the concert-hall. The entrance in the rear is the one used by Royalty; the staircase there leads directly into a suite of three rooms, the larger of which is called the king's saloon. These are in the rear of the orchestra and platform, to the right of which is situated the king's private box, from which box there is direct communica-



tion with the king's saloon. The large hall is provided with a gallery on three sides. As the entrances for the public are on the south side, the court entrance on the north, and the shops are on the east and west, or long sides of the building, the people who frequent the concert-hall in no way interfere with those who use the café, shops, &c. In addition to the shops, there are also flats situated over the narrow back buildings, so that every inch of this vast building is employed to bring in as much as possible to the exchequer. The concert-hall is lighted from side windows, which overlook on one side a balcony formed by the roof

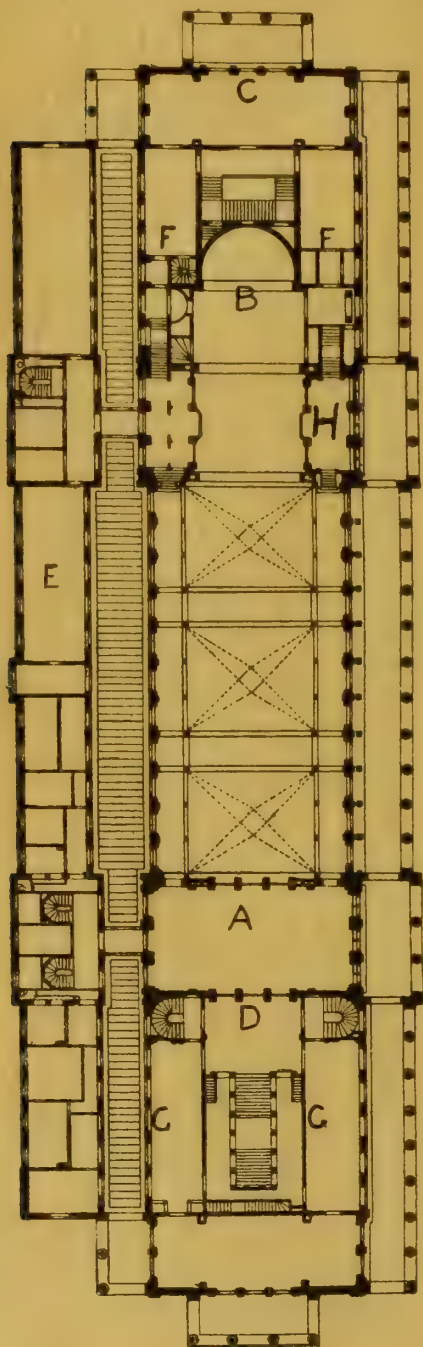


FIG. 2.—A, foyer; B, orchestra; C, king's saloon; D, hall; E, choir retiring-rooms; F, royal saloons; G, retiring-rooms; H, royal box.

of the colonnade, and on the other the glass roof of the arcade. The circular orchestra and staircases are provided with light from above.

I use this hall to illustrate how a place of entertainment may be placed on the first floor over a space used entirely for commercial and other purposes, whereby a large income is obtained, without interfering in any way with the approaches and exits to the concert hall. It is well known that under the existing rules such a building could not be erected in London, for although the site is isolated, and exits can be obtained on all sides, and the concert-hall can be separated from the shops by fireproof flooring,

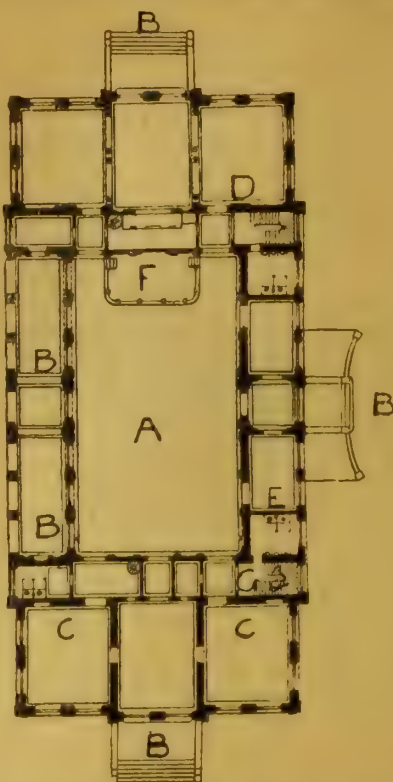


FIG. 3.—A, concert-hall; B, entrances; C, retiring-rooms; D, refreshment-rooms; E, museum; F, stage; G, service staircase.

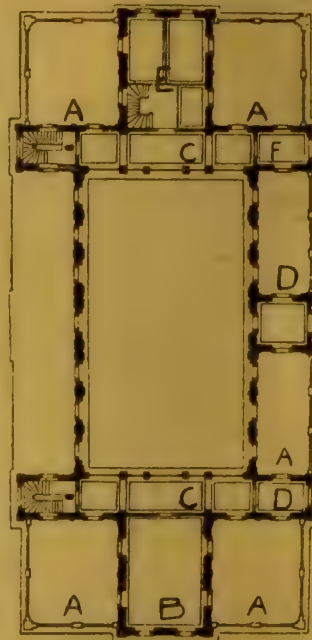


FIG. 4.—A, terraces; B, withdrawing room; C, rooms; D, refreshment-rooms; E, museum; F, corridor or gallery; D, covered terrace; E, retiring-rooms; F, staircase.

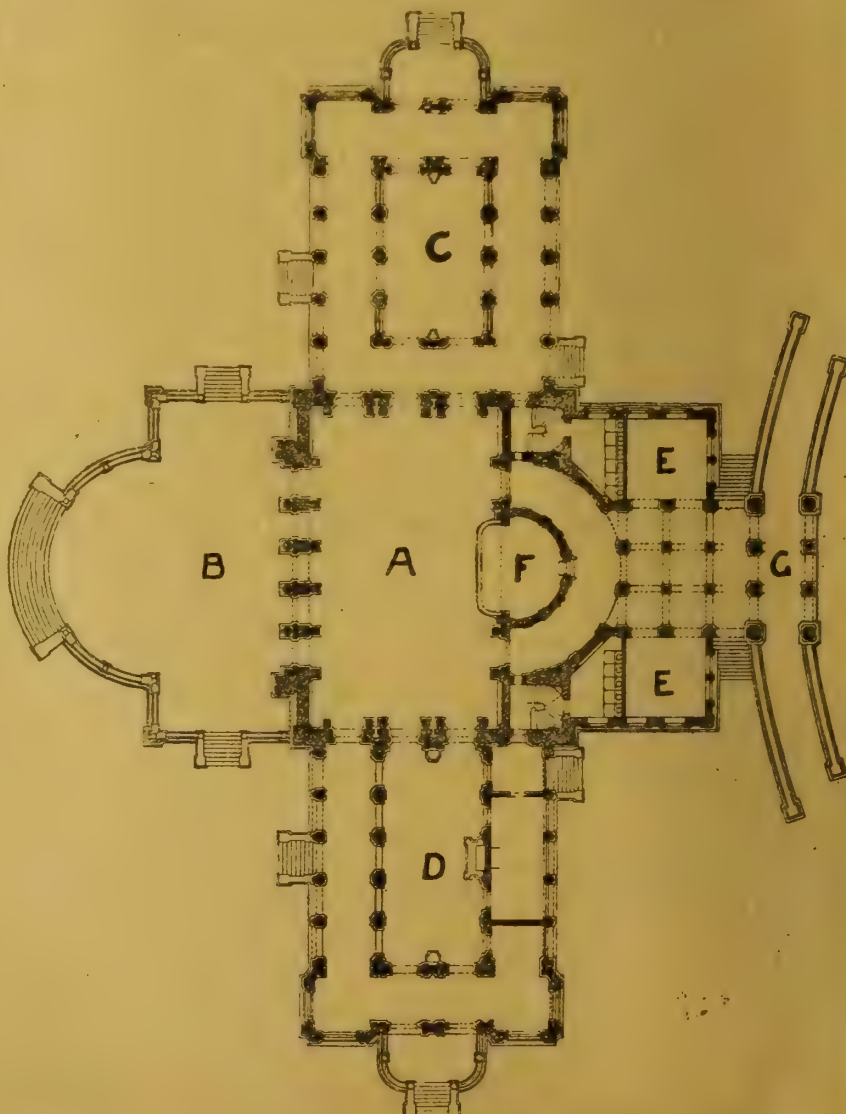


FIG. 5.—A, large hall; B, terrace; C, drinking saloon; D, café saloon; E, cloak-room; F, orchestra; G, carriage-drive.



yet the requirements of the London County Council do not permit the erection of a concert-hall over or under premises used for other purposes. It is not even permitted to place a music-room over a pianoforte showroom. The illustrations given in Figs. 1 and 2 show that these matters

concert-hall and buildings were erected. Fig. 5 shows the ground-plan of this building. The area of the room is 360 square metres. In the centre of one of the longer sides of the concert-hall or fête-room is a semicircular orchestra. On the right-hand is a large café, with a kitchen in the rear, while on the left is a beer-drinking hall. In front of the large hall is an extensive terrace, which can be used for open-air music and promenades in fine weather. In the rear of the orchestra is the entrance and vestibule, with the ladies' and gentlemen's retiring-rooms, and large cloakroom accommodation on either side. It is a peculiar feature of the design that the main entrance is at the back of the orchestra, with the

to which they belong, but are let out for dances, fêtes, concerts, or theatrical entertainments.

In Frankfort there is a concert-hall in the Zoological Gardens, shown in Fig. 6. This

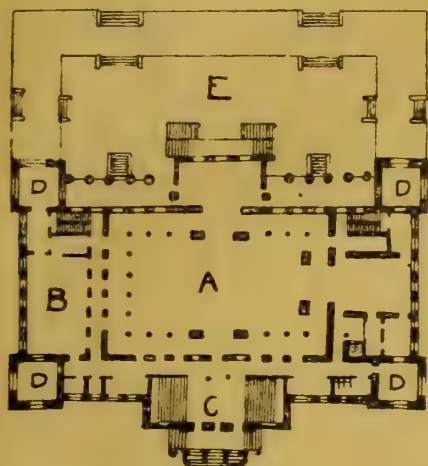


FIG. 6.—A, large hall; B, small hall; C, entrance; D, retiring-rooms; E, terrace.

are looked upon in a very different light in other countries.

In Figs. 3 and 4 is illustrated a concert-hall in Baden, which was built in 1872-75 by Mr. Robert Moser, the architect. The building stands on a plateau surrounded by a large park, with splendid views of the surrounding country. The concert-hall is nearly 27 mètres long, 15 wide, and 13.5 mètres high. The principal entrance is on one side, but there are entrances from all four sides. Retiring-rooms, cloak-rooms, and refreshment-rooms complete the ground floor. On the first floor are terraces over the entrances and some of the ground-floor rooms, those on the right being roofed over as pavilions. These terraces were formed in order that a position commanding the view of the park might be obtained where people could hear the music from within and yet be seated in the open air.

Fig. 5 is a concert-hall in the Stadtpark of Vienna, the ground for which was given to the public by the Emperor in 1860, on condition that a garden should be provided for the residents of Vienna. The cost of the park was 192,000 marks. It is laid out in the form of ornamental gardens,

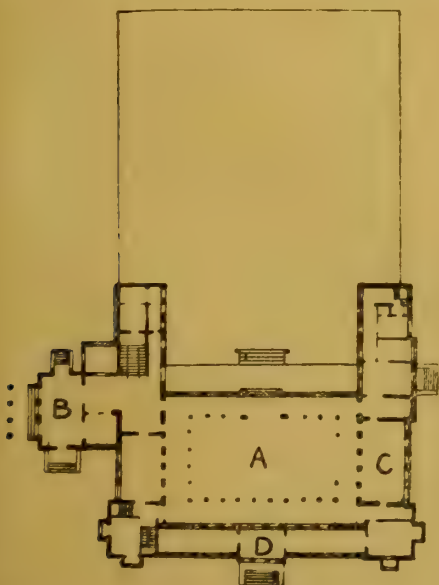


FIG. 7.—A, large hall; B, entrance; C, annex to hall; D, entrance.

containing a large pond or lake, and a drinking well embellished by a beautiful female marble figure by the sculptor, Hans Gosser. The park also contains a memorial of Schubert, and a colossal figure of Dr. Schlinka; but its greatest ornament was not added till 1865-67, when the

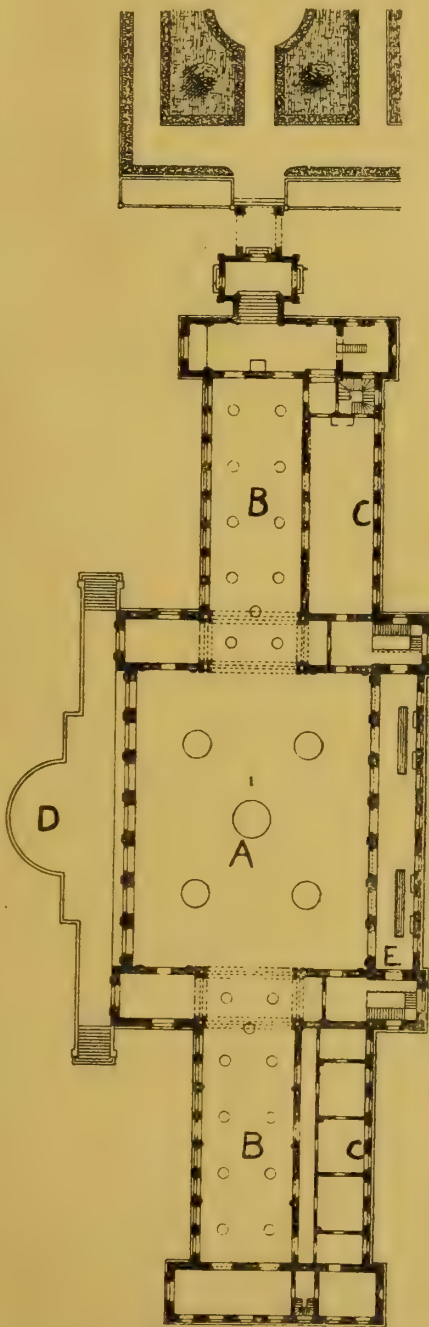


FIG. 8.—A, king's hall; B, winter garden; C, private dining-rooms; D, terrace; E, buffet.

approaches to the hall by a circular corridor behind it. From this corridor are two staircases, one of which leads to the gallery above, where a view is obtained all over the large hall, and the other is used for the service, and from it are approached the manager's rooms and the offices on the first floor, and the servants' rooms in the basement. Exclusive of the terrace, the ground covered by the building measures 1,798 square metres.

Frequently on the Continent one finds these concert-halls and places of entertainment in a public park, the zoological or the botanical gardens. These buildings are not only used by the society

building, like the one previously described, has its carriage approach on one side, and a big terrace overlooking the gardens on the other. Another feature is the loggia, which is approached from the concert-hall. The loggia forms a desirable

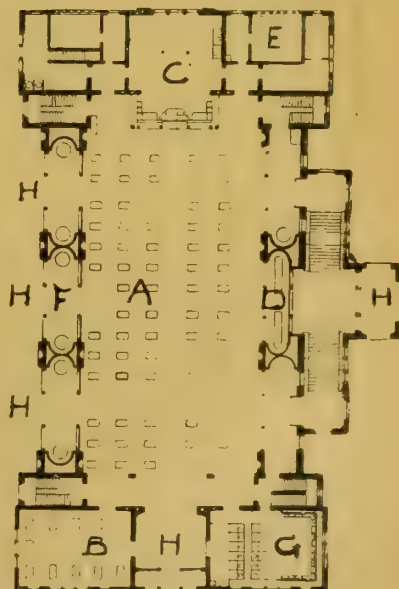


FIG. 10.—A, large hall; B, small hall; C, stage; D, bar, &c.; E, service; F, terrace; G, lavatory; H, entrances.

covered space for those who wish to listen, under cover, to the music out-of-doors, thus avoiding any risk from being seated in the open air. In connection with this hall is a smaller one used for chamber music. Fig. 7 gives a plan of hall in



the Palm Garden of the same city, the arrangements of which are clearly shown on the drawing.

Kroll's establishment in Berlin, of which Figs. 8 and 9 are plans of the ground and first



Fig. 11.—A, kitchens; B, beer cellar; C, cloak-room; D, wine cellar; E, orchestra; F, gallery.

floor, is situated in the Zoological Gardens at Berlin. It was originally intended for fetes and concerts, but being far from the town, is said not to have proved a success. It was rebuilt after a fire in 1851.

Fig. 8 shows the building as originally erected,

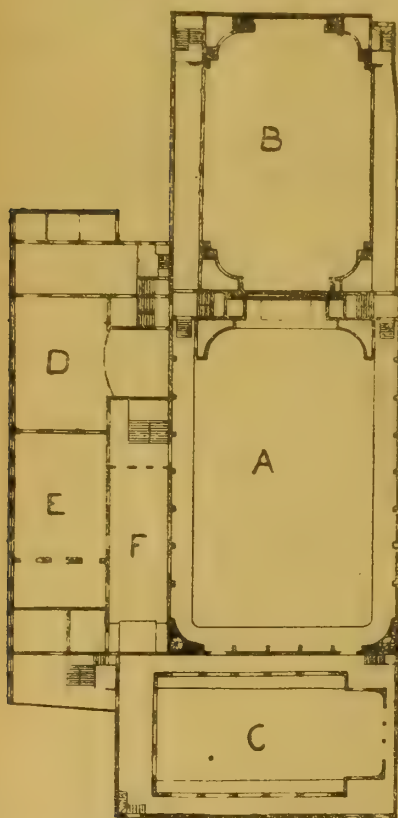


Fig. 12.—A, large concert-hall; B, eastern hall; C, white hall; D, theatre hall; E, west hall; F, corridor.

with the centre hall as a drinking saloon, with winter gardens on either side. There are also private dining-rooms, with buffet in the rear. Fig. 9 shows the building as it now stands, with a theatre fully equipped with stage, orchestra, dressing-rooms, and all the accessories for theatrical

performances on somewhat the same scale as at the Aquarium at Westminster. To the right and the left are exhibition halls, known the one as the Roman Hall, the other as the Knights' Hall. There are several private dining-rooms, and rooms for refreshment and retirement disposed in various parts of the building.

Figs. 10 and 11 illustrate a concert-hall erected for the Industrial Exhibition held in Strasburg last year. The design is the result of a limited competition held among Strasburg architects. There was a novel condition attached to the competition—namely, that the competitors should name who was to be the builder if their design was accepted. The architects who were successful were Messrs. Berninger and Kraft, but they were not employed as architects for the whole of the exhibition buildings, Messrs. Kuder and Müller doing the rest of the work. The large hall shown in Fig. 10 has a superficial area of 800 square metres in extent, while the two small halls occupy a surface of 100 square metres each.

The total cost of the building was 150,000 marks, the principal hall and machinery working out at 20 marks per square metre. The roof of the building is of wood, made of this material for the sake of its acoustic qualities. As will be seen from the plans, the hall is designed for many purposes; the ground-plan is shown set out with a number of small tables to be used for the audience to be seated, as at a smoking concert, or as at one of the old type of English music-halls which are no longer to be found in London, where tables and chairs filled the entire area of the floor space. When used as a restaurant the hall is arranged as shown in Fig. 10. At one end is a stage where orchestra and singer may perform, or theatrical plays be enacted. On the first floor is a gallery running all round the hall, with an orchestra at one end, the side gallery being arranged with tables, like the floor-space below. Under the entire building are extensive cellars for storage of wines, beers, &c., as well as provision for cloak-rooms and retiring-rooms.

Sagebiel's establishment in Hamburg consists (Fig. 12) of a series of halls of different sizes, no two of which are alike. In 1862 the first part of this building was erected in place of one called the Colosseum, the architect of which building was Mr. Buckelbaum. In 1870-71 an additional hall, known as the White Hall, was erected; in 1878 the west concert-hall was made as a further addition; in 1883 the marble staircase and theatre-hall were built; and in 1886 the eastern hall and orchestra completed the pile. All these additions were built under the superintendence of Mr. Martin Haller. The cost of the whole of the buildings was 476,600 marks, and the area covered 4,750 square metres.

## NOTES ON DOMESTIC DRAINAGE.—XVII.

### TROUGH-CLOSETS AND LATRINES.

WHEN a large number of closet conveniences are required, it is sometimes found impracticable, under certain circumstances, to provide ranges of ordinary water-closets with an independent water-waste preventer to each. This is more particularly the case where the closet fittings are under no proper supervision, and subject to much rough and unfair usage, and also where economy in first cost and subsequent maintenance is imperative. Where such conditions exist, it is usual to adopt the type of fitting known as "trough-closets" or "latrines." They should be invariably placed in a detached out-building, well away from any inhabited dwelling, and abundantly ventilated, so that the oxidising influence of large and constantly changing volumes of air may always be present.

A *trough-closet* consists of a long channel or trough of glazed earthenware or enamelled iron, which is partially filled with water for the reception of fecal deposits, the water being retained within the trough by means of a weir or standing overflow at the outlet. The contents of the trough are discharged from time to time, and the water renewed by hand or an automatic flushing tank. The trough-closet may be provided with a continuous front rail for seating purposes, or hinged seats may be used. Fig. 91 is a sketch of a glazed stoneware open trough-closet with hinged seats, weir at outlet, and automatic flushing tank. Every portion of the trough is accessible, and may be readily cleansed by hand with water and a broom.

Latrines consist of a series of basins or pans connected to one common outlet by means of a

pipe, and are essentially a modification of the trough-closet, having portions of the trough covered at intervals. The contents of the whole latrine range are periodically discharged at the same time, and the water afterwards renewed to all the pans. The latrine pans and pipe connections may be of glazed earthenware or enamelled iron.

Fig. 92 shows a range of three latrine pans with standing overflow and waste, a transverse

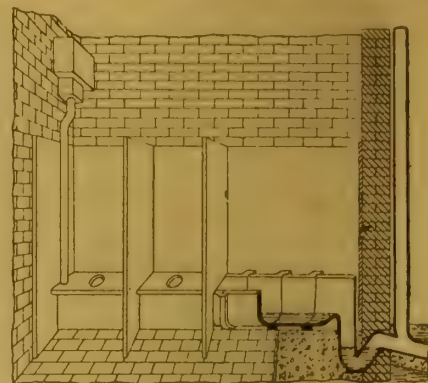


Fig. 91.

section through one of the pans being shown in Fig. 93. The range of latrines are emptied, cleaned, and refilled by hand at stated intervals. Latrine pans, provided with flushing rims, as shown in Fig. 94, may also be obtained, and, if desired, can be arranged so that the whole of the contents are drawn out by siphonic action, the flush, and also the necessary after-flush for refilling the pans to the required water level, being provided by means of an automatic flushing tank.

Trough-closets and latrines should be invariably furnished with an ample supply of water. For trough closets it is usual to provide 10 gallons per seat for flushing, cleansing, and refilling purposes, whilst for latrines with flushing rim-pans, the water supply considered necessary varies from six to eight gallons per pan. It should be borne in mind that all trough closets and latrines should be trapped at the outlet. (See Figs. 91 and 92.) It is also desirable that they should, as far as possible, be uninclosed, so that every part may be conveniently reached for cleaning when necessary. Where inclosed, the riser should be of slate or other impermeable material, the intervening space between the latrine and the riser being filled with

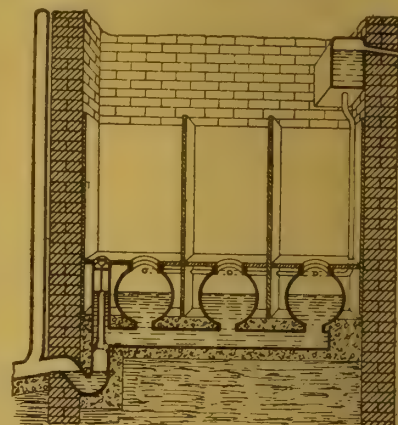


Fig. 92.

cement concrete, and floated level with the top of the pan. If wooden seats are used they should be hinged and well painted on the under side. The back wall of the latrine compartments should be lined with slate, or rendered smooth in cement, the divisions being of slate or enamelled cast iron.

Under the most favourable circumstances, trough-closets and latrines, from a hygienic point of view, cannot be considered as thoroughly satisfactory and efficient, inasmuch that the great aim of sanitary science, so far as it relates to the disposal of domestic sewage, is not carried out—viz., that all sewage matters should be immediately removed to some place where they may be subjected to proper treatment without injury to health. Instead, therefore, of the faeces being



removed at once, they are allowed to remain within the trough or pan until such time as the whole is flushed throughout. Considering that the natural process of putrefaction or decomposition commences immediately on the evacuation of such effete organic matters as faeces, urine, &c.—especially if moisture and warmth be present—the retention of decomposing faeces within any fitment for a more or less lengthened period is not conducive to the maintenance of general health, and in the case of certain intestinal diseases may be fraught with positive danger. In addition to the sanitary objections, the use of a fitment in which the excrement previously deposited still remains, produces a feeling of disgust in all persons possessing a normal sense of personal cleanliness. Trough-closets and latrines are also difficult to keep clean, as the sides and bottom gradually become furred with faeces, except when thoroughly and frequently cleaned by hand. Unless rendered absolutely necessary for the reasons already mentioned, it is better not to use conveniences of this description, but to provide a range of independent wash-down closets of simple and inexpensive manufacture, having a separate flushing apparatus to each. The flushing apparatus to the closets may be self-acting, the discharge being effected automatically by means of a seat or door-action in situations where the users cannot be relied upon to pull the handle of the ordinary water-waste preventer.

#### TESTING DRAINS.

The whole of the drains should be tested by hydrostatic pressure before being covered in, to make sure that every pipe and joint is perfectly sound and watertight. Where Portland cement has been used as a jointing material, sufficient time must be allowed for it to become set before the water-test is applied. Ordinary stoneware drains, if well laid with pipes of good quality,

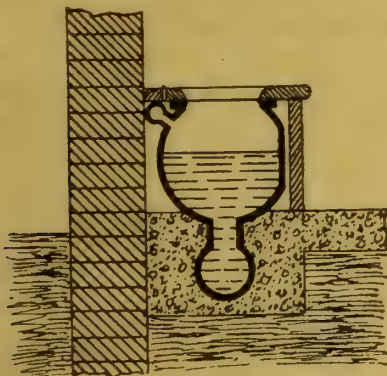


Fig. 93.

should be able to withstand a pressure of 8ft. or 10ft. head of water without leakage; but it is not desirable to subject them to a greater head than that mentioned. Good cast-iron drains laid with caulked lead joints should be capable of withstanding a pressure of 200ft. head of water, but it will generally suffice if they are tested up to a working head of 10ft. or 20ft.

For testing purposes, the drain is securely stopped with a "drain-plug" or stopper at the lower end, and filled with water to the level of the highest gully. If additional head of water is required to that already given by the fall of the drain, a length or two of drain-pipes can be temporarily fixed in a vertical position at the head of the drain, the joints being made with well-tempered clay.

The drains being filled with water to the required level (which should be carefully marked), it must be noted whether the water remains at that level for any length of time. If the same level is maintained for about two hours, the drain may be considered as satisfactorily fulfilling the test. On the other hand, if the water-level is observed to be continuously falling, a systematic search for the cause of leakage must be made, every pipe and joint undergoing a rigorous examination. After the defective pipes and joints have been made good, the drain should be again filled with water, and the test re-applied until the whole is found to be perfectly watertight.

With stoneware drains it will sometimes be seen that the water level continues very slowly to subside without any defective joints being

discoverable. This will probably be found on examination to be due to the "sweating" of the pipes, especially if they are subject to an undue pressure of water. Notwithstanding every care being taken to use only pipes which are highly vitrified and apparently perfectly coated with an impermeable glaze, yet it is found (and may be proved by experiment) that minute quantities of water will be absorbed by and pass through the

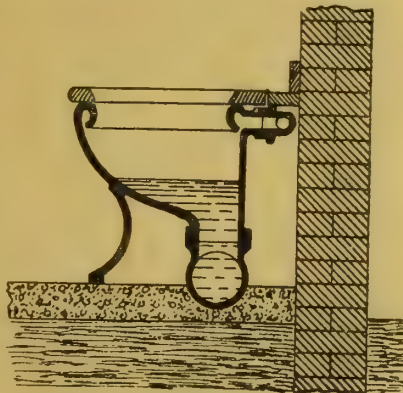


Fig. 94.

pores of the pipe. Where water has penetrated the stoneware material in this manner, the outer surface of the pipe will present an appearance similar to that of perspiration exuding from the pores of the skin. This may be reduced to a minimum by using only drain-pipes which have been examined and tested before leaving the manufactory, and each pipe should bear upon it an impress of the maker's stamp to that effect.

Where the drains are too long to be tested in one operation on account of the excessive pressure that would be brought upon the pipes at the lower end, or the system is of an extensive nature, it is

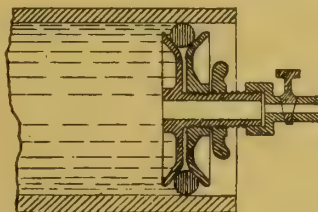


Fig. 95.

desirable to test the drains in sections. In cases where a section to be tested occurs between two manholes, as in a long main drain, the end discharging into the lower manhole is stopped, whilst a bend with one or more lengths of drain-pipe is fixed in the manhole at the head of the section. By this means, any slight leakage can easily be detected, owing to the perceptible lowering of the water level within the upright pipe, whereas, if the manhole were partially filled

where required, and the trenches filled in and rammed whilst the drains remain filled with water, so that any damage to the pipes or joints may be immediately detected.

The form of drain-testing plug or stopper usually employed consists of a stout indiarubber ring, having a diameter slightly less than the drain to be stopped, loosely placed between two metal discs. On screwing the discs together by means of a small thumb-screw, the rubber ring is expanded or forced outwards until it is tightly compressed against the interior surfaces of the drain-pipe, so as to form a perfectly air and water-tight joint. It is desirable that the axis of the plug be in the form of a hollow pipe fitted with a screw cap or test-cock, so that on completion of the test the water may be allowed to escape gradually.

Fig. 95 is a section through a drain-plug of this description, and provided with a test-cock. This form of plug may consequently be used in connection with a smoke-machine at any time if desired.

Another type of drain-stopper consists of an indiarubber bag capable of being inflated by means of an air-pump (see Fig. 96). This form of plug is very compact and portable, and may be found useful in situations where the ordinary form of expanding plug could not be used, as, for instance, when the opening to be stopped is of an oval or irregular shape.

When the gradients of the drain are so steep that the water test would bring an excessive pressure to bear upon the lower portions, the "smoke

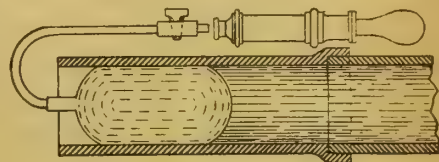


Fig. 96.

test" may be substituted. In such cases every joint should be minutely examined whilst this test is being applied. After the smoke test has been satisfactorily carried out, it is advisable to form a collar of fine concrete round each joint as an additional safeguard.

The smoke test is applied by attaching a smoke generating machine, or asphyxiator, to the lower end of the drain, the smoke being driven into it by means of a fan or bellows attached to the machine, whilst the other ends of the drain must be stopped with drain plugs. Where the drains terminate in trapped gullies, it will be sufficient seal to fill the traps with water.

The smoke test should also be applied to all soil and ventilating pipes. The asphyxiator must be connected to the foot of the soil-pipe, the top of the ventilating pipe plugged, and the traps of the closets filled with water. Where it is not convenient to attach the asphyxiator to the foot of the soil-pipe, the smoke may be driven into the soil-pipe from the manhole into which the soil-drain discharges, the machine being connected to

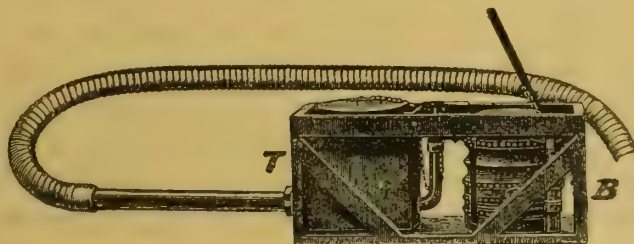


Fig. 97.

with water, it would require an excessive leakage to cause any noticeable difference of level over such a large area, as is comprised within a manhole of normal dimensions.

The bottom of all manholes should be afterwards tested, to ascertain that the joints between the channels, drains, and benchings are perfectly water-tight.

Where drains require to be imbedded in concrete, or the sides of the pipes haunched up with concrete, they should first be tested and made thoroughly water-tight in themselves. Afterwards the pipes should be covered with concrete

the drain within the manhole. Whilst the soil-pipes are undergoing the smoke-test, particular attention should be given to all the joints that may be within the building, such as the connection of closets, housemaids' sinks, &c., to the soil-pipe.

Fig. 97 shows a well-known smoke-generating machine for drain-testing purposes. It consists of a double-action bellows B, connected with a copper cylinder contained within a square tank of sheet copper, T. This cylinder forms the fire-box or combustion-chamber, in which smoke is generated for the purposes of the test. The square



copper tank surrounding it is filled with water, so that the combustion-chamber may be kept as cool as possible. A deep copper cover or float is placed over the cylinder, so that the water in the tank forms a thoroughly air-tight seal or joint between them. The combustion-chamber is connected to the drain to be tested with strong india-rubber tubing, and the smoke forced in by the continued working of the bellows. Large volumes of dense smoke having a powerful odour may be produced by igniting a quantity of oily cotton waste, sulphur, or prepared smoke-paper within the fire-box, and allowing it to smoulder; but precautions should be taken that the fan or bellows be carefully worked, so that the smoke material may not burst into open flame: otherwise scarcely any smoke will be obtained.

It will be found that the float of the smoke-machine will rise in the water as the smoke-pressure within the drain increases. Should the drain be thoroughly air-tight, the float will remain stationary at the level to which it has been raised by the smoke-pressure; but if the drain is defective, the float will fall at a rate proportionate to the extent of the leakage. The action of the float in this way demonstrates the fact as to whether the drains are air-tight or not; but the leakage or leakages can only be localised by careful searching throughout the whole of the drain under test, the defects being made apparent by the issuing smoke.

## "BUILDING NEWS" DESIGNING CLUB.

A SMALL BRANCH BANK.

THE two designs published herewith are those which we have chosen for the first and second places in this competition, and it is to be understood, of course, that we do not, in making this award, suppose these plans are either of them to be reckoned as exactly ideal arrangements for the purpose in hand. This remark is made because some competitors appear to presume, when we make a choice in these little mutual improvement contests, that we publish the drawings as models, whereas the most which can be said for them is this—they are the best among those submitted for the particular subject under notice. As to how far the plans comply with the conditions and realise our proposals can be well determined by the readers themselves, who always have a copy of the instructions printed for reference with our award. For the Bank the following are the particulars:—A small branch Bank in a country town, on a site in the main street, having a frontage of 30ft. with a depth of 80ft., a right of way existing at the rear. The accommodation to include a residence for the manager. On the ground floor a public office, 25ft. wide by about 21ft. deep, or of equal area, to be provided, inclusive of the public space in front of the counter, which latter is reckoned as 4ft. in width. A small manager's office, with waiting lobby attached, and a little strong-room, inclosed by 2ft. walls. On the first floor the living-rooms of the manager's house to be located; the kitchen and offices may either be on the upper floor or be contrived level with the dining-room. There are in either case to be four bedrooms, with bathroom and w.c. A coal-cellar to be provided at the rear, and a clerks' w.c. and lavatory to be contrived on the ground floor. The elevation to be in stone on the ground floor, and brick with stone dressings above. Adjoining premises 25ft. high to top of parapet. The building frontage is level with the inner pavement line, and faces south; the site is a level one. Scale, 8ft. to the inch for the buildings; a block plan to a smaller scale will suffice to show the yard at back if desired. A good view of the façade is necessary, and sufficient drawings to illustrate the design.

"Tadpole" sends a very quiet and unpretentious façade, which accompanies a fairly convenient plan. The one vestibule is a much more economical arrangement where space is so restricted, and no mistake can be made as to which is the private and which is the public entrance. The two doorways for the bank in "Owl's" design are not wanted, and are not particularly convenient either. The central area enables "Tadpole" to light his private hall and staircase, and, besides, he isolates the clerks' lavatory and w.c. from the offices. The waiting-room and lobby to the manager's room are lighted from the same yard. The scullery, as well as the bathroom and w.c. belonging to the house, being located over the ground floor, sanitary arrangements keep the drainage-work nicely together.

A servants' w.c. seems desirable in a bank manager's residence. The kitchen could be shut off by a door being placed under the archway on the landing, and the window overlooking the yard makes the passage to kitchen a ventilated lobby, which is always an advantage. The large window to the scullery is hardly necessary, and does not help the effect of the rear elevation. The all-over appearance of the front shows a lack of crispness on the part of the author in treating his façade. Formality, when attended by a more monumental scale and more ambitious detail, is for the most part a dominating condition, and the recurrence of the features which are rich in their individual character becomes the leading consideration, whereas in so unpretentious a front as "Tadpole's" the interest of the composition would have been materially enhanced by grouping the fenestration, instead of spacing it so rigidly over the ground-floor openings. Simplicity is of the utmost value, and over-ornateness is always to be avoided when good taste determines in art matters; but the object of a bank is business and increased custom, so that the architect must conform to the requirements of his clients in this respect, at any rate, giving them as dignified a façade as means will allow, with ample room for the name of the establishment to be displayed conspicuously without vulgarity. These observations suggest themselves because the ground-floor story of "Tadpole's" design seems to be lacking in these qualities. The frieze and cornice are not bold enough, and the pilasters would look thin in stone, and are too small for a granite treatment. "Owl," on the other hand, gives increased height to his banking-room, making, however, too overbearing a feature of the arched window in the centre, with its crude massive voussoirs, which crush the pilastered and thin rusticated quoins of the reveals in a very uncomfortable-looking way, certainly not in any sense a pleasing contrivance. The heavily-handled pediments, too, oversailing the adjoining property are faults, and not improvements, to the design. The plan is sacrificed too much to the domed central light, and the area above it in the middle of the house cuts the arrangement up, and also crowds the rooms. "Owl," notwithstanding, has an idea in his work always which we recognise, though he fails over practical considerations. Thus the w.c. should not be reached through the bathroom—the complications of such a contrivance must be manifest even to a bird of wisdom, and so must the need of reaching the garden without going down the coal-way staircase or through the bank clerk's lavatory. "Invicta" sends a very pretty little front, and we place him third in consequence; but his plan is a poor affair, wasteful in passages and lobbies, and loss of room in the roof. The two doorways are a mistake, too; but there is otherwise a suitability in the elevation which would be popular and suitable, though devoid of any really original idea. "Mac" seems to merit the next position, and his elevation aims at breadth and originality within rigid confining lines. His plan, too, shows care and thought for detail; but it is crowded and peculiar, exactly as the front is. This is a matter for regret, because "Mac" has clearly done his best, and if we cannot admire his design, we fully accord him praise for pains and serious endeavour which in the end will tell. In the meantime, "Mac" will do well to observe good work and study good detail. "Pantile" draws poorly, and makes an elevational perspective answer for a so-called "sketch." We cannot praise his plan nor admire his elevation; but the two projecting square bays emphasise the entrances, and give an individuality to the front, though the dual arrangement of identical doors would lead to permanent confusion. "Pantile" is a bad planner. "Oberon" has a façade of distinct merit, but open to the faults of the last-named competitor, more particularly in the matter of entrances. The plan is more compact, with a larger devoid of both light and air. His perspective is wanting in breadth of style, and is lacking in light and shade. "Gilbert" gives his public very little space, and he wastes room on a big landing to the first floor. The view does not agree with the plan or elevation, and denies justice to the geometrical drawing, which has merits. The drawing-room big window ought to have been in the centre. "Gilbert" must give more thought to his work if he would improve. "Pickwick" is a rough draughtsman, and he is unmindful of the loss of space in blank gables and tall roofs. In these days such matters demand some attention. A successful architect never overlooks details of this kind. The arched

windows in the top floor are not effective, and look out of place. The wasteful hall and dark landing to the first floor would condemn any plan. "Fear" seems improving. The window to the banking-room is very ugly, and the general effect of the elevation recalls the "old rows" houses at Chester. There is, at any rate, a notion in "Fear's" work, if only he could learn to be more practical, and attend to details. This design looks so like playing at building. "Perseverance" comes next, and hardly passes muster above the ordinary, while "Mandalay," though more spirited in draughtsmanship, is too commonplace in detail to be good. "Brian" cuts up his façade needlessly, and "Kaffir" muddles his front with a bay window set between two porches, exactly like each other, and both very bad. The other designs are as follows: "Jackdaw," "Moor," "Oriol Bill," "Mannikin," "Cariol," "Vormak the Viking," "La Cigale," and "Boer."

## CHIPS.

Mr. R. H. Bicknell, C.E., Local Government Board inspector, held an inquiry at the Town-hall on Thursday last week, in respect to an application which had been made by the Leek Urban District Council to the Local Government Board for sanction to borrow £5,000 for the erection of a butter market, fire-station, and lock-up shops, and for improvements to the Red Lion Hotel.

The Evangelical Union Church, Perth, has just been sold for £3,750. The congregation has procured a site at the corner of Kinnoul-street and Murray-street, where it is proposed to build a new church.

After much discussion, the county council for Glamorganshire have decided to erect a block of county buildings, to include a council-chamber, offices, and committee-room. There is still much difference of opinion as to the site to be selected, and as a compromise it was resolved at the same meeting that the clerks of the urban district councils of Pontypridd, Port Talbot, Llandaff, Neath, and Bridgend, be written to and asked what sites in their own localities they could recommend.

The sixth annual conference in connection with the Amalgamated Builders' Labourers' Union of Great Britain and Ireland was held throughout last week at Nottingham, under the chairmanship of Mr. J. Judge (Leeds), Mr. J. Jackson (Nottingham) being in the vice-chair. In all, about 50 delegates were present, hailing from Bradford, Birmingham, Barnsley, Castleford, Chesterfield, Derby, Dewsbury, Grimsby, Gloucester, Harrogate, Halifax, Hull, Ilkeston, Leeds, Leicester, Loughborough, Melton Mowbray, Malvern, Middlesbrough, Manchester, Nottingham, Nelson, Rotherham, Sheffield, Stockton-on-Tees, Shipley, Wakefield, and York.

Of the 14 second-class medals awarded for oil-paintings by the jury of the Champs Elysées Salon, two went to British artists—one to Mr. Lorimer for his "Marriage de Convenience," and the other to Mr. Gotch for his "Infant Jesus." Thirty third-class medals were also awarded by the jury. Of these, three fell to British artists—namely, to Mr. P. Melton Fisher for his "Summer Night in Venice," to Mr. G. Harcourt for his "Thought Reader," and to Mr. A. S. Cope for his portrait of Mrs. Mundella.

The new Roman Catholic Church of St. Thomas of Canterbury, at Woodford Green, Essex, was opened on Whit-Sunday. The new church, built from the designs of the Very Rev. Canon Scholes, is in the Early English style, and will accommodate 700 persons. At present the church has three altars; the high altar, with a tabernacle of alabaster richly carved, is under the patronage of St. Thomas of Canterbury; the altar in the south aisle is dedicated to Our Lady; and the one in the north aisle to St. Francis of Assisi. The church is not yet completed, but will be finished and ready for consecration by his Eminence Cardinal Vaughan on July 7.

A new Congregational church has been erected and opened at Tonge Moor, Bolton, as the outcome of a mission started by the Mawdsley-street Church. The new church, which was opened last week, has cost £2,700.

The foundation-stone of a new Conservative Club at Hetton-le-Hole was laid on Saturday. The building has a frontage on the main road of 58ft., extending back for the distance of 100ft. On the right hand of the hall will be the smoke-room, 20ft. by 18ft., and on the left will be the reading-room and committee-room, each about equal in size to the smoke-room. Communicating with the bar there is a caretaker's house, including kitchen and two bedrooms. The billiard-room will be on the upper floor, and will be 55ft. long by 20ft. in width, affording accommodation for two tables. On the same floor is a games room. The architect is Mr. Frank Caws, A.R.I.B.A., of Sunderland, and the contractor for the entire work is Mr. S. Branton, Sunderland.



## CONTENTS.

Some Results of the New Locomotion .....	809
Rival Claims and Applications .....	810
Royal Architectural Museum .....	811
Concert-Halls and Assembly-Rooms.—XVIII. ....	811
Notes on Domestic Drainage.—XVII. ....	814
BUILDING NEWS-DESIGNING CLUB .....	816
THE BUILDING NEWS DIRECTORY .....	XIII
Our Illustrations .....	817
Building Intelligence .....	836
Engineering Notes .....	836
Architectural and Archaeological Societies .....	836
The A.A. Dinner .....	837
Medals at the Salon of the Champs Elysees .....	837
Modern Opera-Houses and Theatres .....	837
Cast-Iron in Builder's and Contractor's Work.—XXV. ....	838
Obituary .....	839
Competitions .....	839
Correspondence .....	840
Intercommunication .....	841
Legal .....	841
Legal Intelligence .....	841
Water Supply and Sanitary Matters .....	841
Our Office Table .....	842
Meetings for the Ensuing Week .....	842
Trade News .....	843
Tenders .....	843

## ILLUSTRATIONS.

"THE COLLATION," BY GABRIEL METSU (MDCXXX.—MDCXLVII.)—HOUSES AT SWANAGE, HAMPSTEAD, AND FRENESHAM.—ROYAL ACADEMY TRAVELLING STUDENTSHIP DRAWINGS, BY JAS. S. STEWART.—PARK LODGE, SCARBOROUGH.—NEW CO-OPERATIVE PREMISES, BRIGHOUSE.—"BUILDING NEWS" CLUB DESIGNS FOR A SMALL BRANCH BANK.

## Our Illustrations.

OLD MASTERS ON THE CONTINENT.—NO. XXXIV.: "THE COLLATION," BY GABRIEL METSU.

This fine specimen of the famous Dutch master, Gabriel Metsu, of Amsterdam, is located in the Royal Gallery at Brussels, where there are other examples from his hand. We have three of his works in the National Gallery—viz., "The Duet," "The Music Lesson," and "The Drowsy Lady." In the Louvre Gallery at Paris there are some exceedingly fine paintings by him—notably, "The Herb Market of Amsterdam," which was sold on one occasion for 28,000 francs. His best *genre* picture there is "An Officer Entertaining a Lady," a work of similar type to that which we have chosen for illustration to-day. "A Dutch Woman" and "A Dutch Cook," also at Paris, recall Metsu's master, Gerard Dou, who naturally much influenced his clever pupil, though, no doubt, Metsu in his early years took Terburg and Frans van Mieris, his contemporary and fellow pupil, as models. He adopted, however, a more finished style, and his work has a distinct character of its own. His dark backgrounds, common to the Dutch school, sacrificed to some extent, no doubt, the true effect of chiaroscuro; but, on the other hand, the figures forming the subject of his paintings are thereby brought into the prominence of relief. "The Music Lesson," "The Chemist," and "The Adulteress" are the titles of Metsu's other pictures, not before mentioned, in the Louvre. In "The Collation," as the Brussels painting is called, the design is thoroughly characteristic of this great "Little Master" of Holland. The table, chair, and chimney-piece, all of which are faultless in arrangement and balance, are true studies from contemporary examples, and every detail of the composition shows marked refinement and beauty of colouring. Metsu was, in fact, unsurpassed in his delineation of character and gesture, and in hardly any work of his does this delicacy of manipulation and careful finish, for which he was always distinguished, play a more important part than in the subject of our illustration to-day. Note the exquisite and expressive rendering of the ladies' graceful hands in this simple and yet comparatively sumptuous scene of town life in the house of some representative of the wealthier classes, probably in Amsterdam. Metsu ranks as a master of unqualified standing, for his works are pervaded by a distinction rare in the works of any school. In many of them the influence of Rembrandt is no doubt clearly observable. Beside the examples already mentioned, the galleries of Amsterdam and the Hague, as well as Dresden, contain several specimens, and in England the Royal

collection, and those of some leading private collectors, like that of the late Sir Richard Wallace, have representative works from his hands. He died at the very early age of 37, in October, 1667, and was buried at Amsterdam. Metsu was a native of Leyden, where he was born in 1630, and at the age of 14 he had become a member of the Leyden Guild of Painters. Our illustration is taken from a photograph of the original painting by Mr. Franz Hanfstaengl.

## HOUSE AT SWANAGE.

This double-page plate represents three drawings grouped together in one frame at the Royal Academy Exhibition, from the pencil and brush of Mr. Howard Gaye, from designs by Mr. Chas. F. A. Voysey. The builders of the house at Swanage are Messrs. Parsons and Hayter. The site is on the crest of a hill at Studland Bay. The material is brick, cement, and rough-cast, with local stone dressings. The casements are of iron and local stone. Slates are used for the roofs, with lead down-pipes and ridges. The study is to have an overmantel with panels by Mr. G. Frampton, A.R.A. The contract price is £1,194.

## PROPOSED HOUSE, HAMPSTEAD.

This house was "proposed" for a somewhat uncommon site in Platts-lane, Hampstead. Owing chiefly to the apparently needless pressure of officialism the site is, however, abandoned, although every working drawing was made and traced, and even quantities prepared and agreed upon. The dispute turned on the question as to whether the south-east side was the back of the building as well as what might be styled the real back towards the north-east, which latter is the width also (see block plan). As the other dimension is longer, it is right to call it the length or depth. The Building Act says the area is to be throughout the width of the building, and that Mr. Voysey has got. Besides which, the plan shows no rooms dependent for light and air on the south-east side, and so the spirit of the Act, which is a proper one, is not violated. Rather, however, than have an expensive argument about the affair, the owner abandoned the scheme, for the site was too narrow to allow of the additional space, which would have been waste ground. The house was to have been built in stock brick, with Monk's Park stone dressings and iron casements, and rough-cast on all external brickwork, finished over with lime white. The roof would have been covered with Broseley tiles, and all the external wood and iron was to be painted pale Brunswick green.

## HOUSE AT FRENESHAM.

THE house at Frensham has been built for Mr. E. J. Horniman, of brick, rough-cast in cement, with Westmoreland green slate roof with lead hips and ridges. In the roof there is an attic 28ft. by 13ft., and one servants' bedroom. The contractors were Messrs. Thompsett and Kingham, of Farnham.

## SKETCHES IN SPAIN AND ITALY: ROYAL ACADEMY TRAVELLING STUDENTSHIP DRAWINGS.

This sheet of sketches by Mr. James S. Stewart needs but a few words of description. Burgos Cathedral merits the title of a romance in stone if any church does, and, unlike some other Spanish cathedrals having noble interiors inclosed in an indifferent husk, Burgos is magnificent and interesting outside as well as in. Originally it was designed to be 90ft. wide by nearly 310ft. long, and it is, no doubt, diminished in scale as compared with Toledo. Externally the church is as picturesque and effective a design as can be found anywhere in Europe. The west front (1442) is essentially a German design, with three portals and two spires of open work, recalling Cologne. A cimborio or dome marks the crossing, built in place of the old dome, which fell in 1539. This work was completed about 1567. The four large masses of masonry introduced as piers to carry this new dome mark the effect of the church considerably inside, "with the 'coro' thrust," as Fergusson says, "into the nave." The rich details of the Capilla Chapel and the Comestable Chapel make up largely for these defects, and combine in rendering Burgos a church of the first degree of interest and consequence. A plan of the building is given in Street's "Gothic Architecture in Spain." The Pavement from Siena is a suggestive example of much beauty of detail. Salamanca, whose pride was laid in the dust by the French, still remains one of the most interesting cities in Spain to the architect and artistic

antiquary. The florid Gothic of the cathedral is scarcely so full of suggestiveness as the Renaissance domestic buildings of the town, and among these the Casa de Monterey is one of the most characteristic and beautiful examples of the Plateresque style to be seen anywhere.

## PARK LODGE, SCARBOROUGH.

THIS house is situated at the east entrance to the public park. The centre part of the building is an old residence built in local stone. Additions are proposed to be made by adding two side wings and an extra story—the wings to the height of the first floor to be built in local stone, and the story of red pressed brick with Whitby stone dressings, terminating with a richly-carved Georgian cornice and roof covering in Broseley red tiles. The site is pleasantly situated, having a commanding view of the sea, the background to which is densely covered with forest trees that form part of the grounds attached to the residence of the Earl of Londesborough.

## NEW CO-OPERATIVE PREMISES, BRIGHOUSE.

THESE buildings comprise, in King-street, two shops on the ground floor, with good wide corridor between. On the first floor the general office, tailors' cutting-out room, manager's office, and lavatories, &c., and on the second floor board-room, committee-room, waiting-room, and lavatories; on the third floor the workrooms for boot and tailoring departments are placed; hydraulic lifts communicate with the various floors. In Hangram-street are the warehouses, four stories in height. The whole of the buildings are cellared, and will be used as store-rooms, and are laid with Portland cement concrete. The buildings throughout are heated with hot water, on the low-pressure system. The fittings are of pitchpine. The works have been carried out from the designs, and under the superintendence, of Messrs. Sharp and Waller, architects, Brighouse.

## "BUILDING NEWS" DESIGNING CLUB: A SMALL BRANCH BANK.

(See description on page 816.)

## CHIPS.

The Bishop of Carlisle reopened, on Tuesday week, Ginsdale Church, which has been restored according to plans by Mr. Curwen, architect, of Kendal.

Tenders have been accepted for the erection of a new Congregational Church at Carnforth, which is to seat 450 persons, and cost £2,000.

Bellahouston Park, recently acquired by the corporation of Glasgow as a public park, was opened on Wednesday. At the mansion-house an exhibition gallery in the centre of the grounds has been arranged, with a photographic collection as the first display.

Mr. T. W. Hawes, builder, of Brentwood, Essex, died very suddenly on Thursday in last week from spasms of the heart; he fell and expired in the presence of his wife just as he had returned from one of the workshops. He was 64 years of age, and was widely known in the district, being a guardian of the poor, a parish councillor, and secretary to the horticultural society.

The name of Mr. John Borland, tile manufacturer, of Stonehouse, N.B., has been added to the commission of justices of the peace for Lanarkshire.

The School Board for Carnarvon have adopted plans by Mr. Rowland Lloyd Jones for new board schools.

In reference to the proposed site for the statue of the Queen, presented to the City Corporation by Sir A. Seale Haslam, the City Commission of Sewers yesterday directed its engineer to erect a rough model of the statue, with a temporary refuge, at the northern end of Blackfriars Bridge, at the junction of the Embankment and Queen Victoria-street, with a view to seeing what alterations in the existing refuges would be necessary.

The Royal assent to the Exchequer-row Area Improvement Scheme was intimated to Aberdeen Town Council on Monday. A special committee was appointed to consider the steps to be taken for purchasing the lands required for the scheme, and otherwise for carrying the scheme into operation as soon as practicable.

A new station on the Great Western Railway, called Johnstown and Hafod, between Wrexham and Ruabon, was opened on Monday for passenger and general traffic.

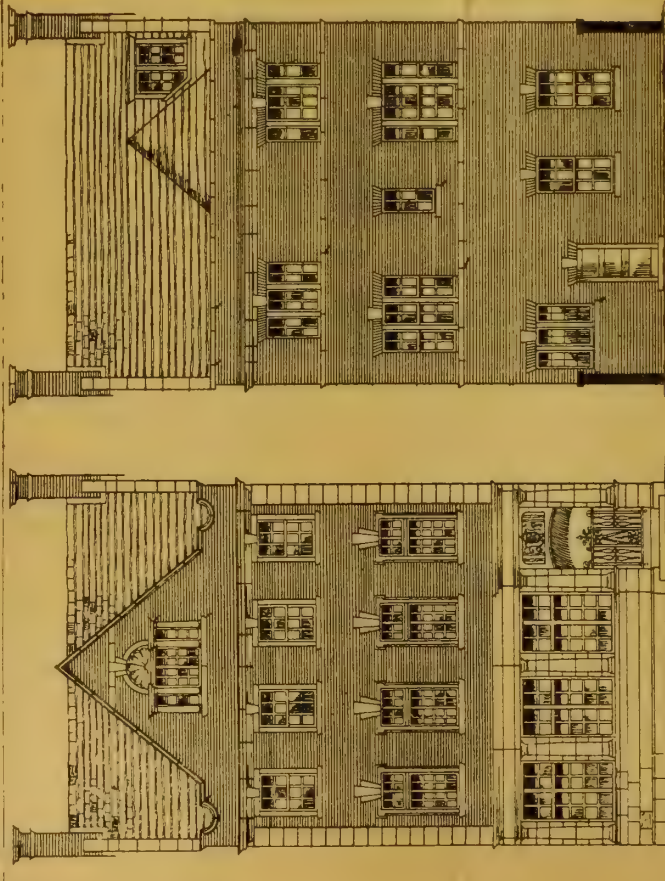
The Downham Schools, Norfolk are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.



THE BUILDING NEWS DESIGNING CLUB  
A SMALL BRANCH BANK BY TADPOLE

MAY 1896

SCALE 1/4" = 1' 0" 30' 40' FEET



FRONT ELEVATION

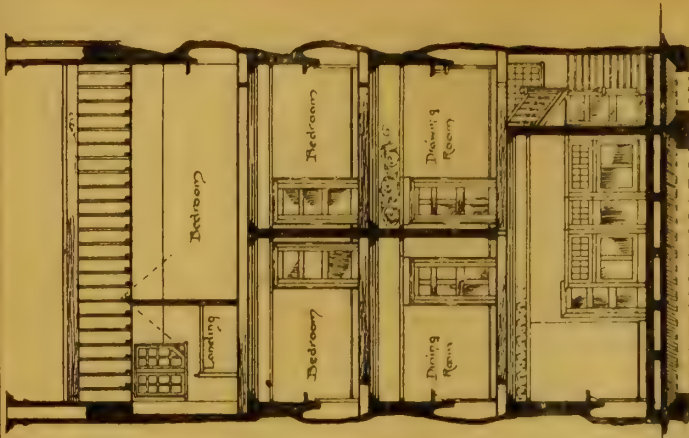
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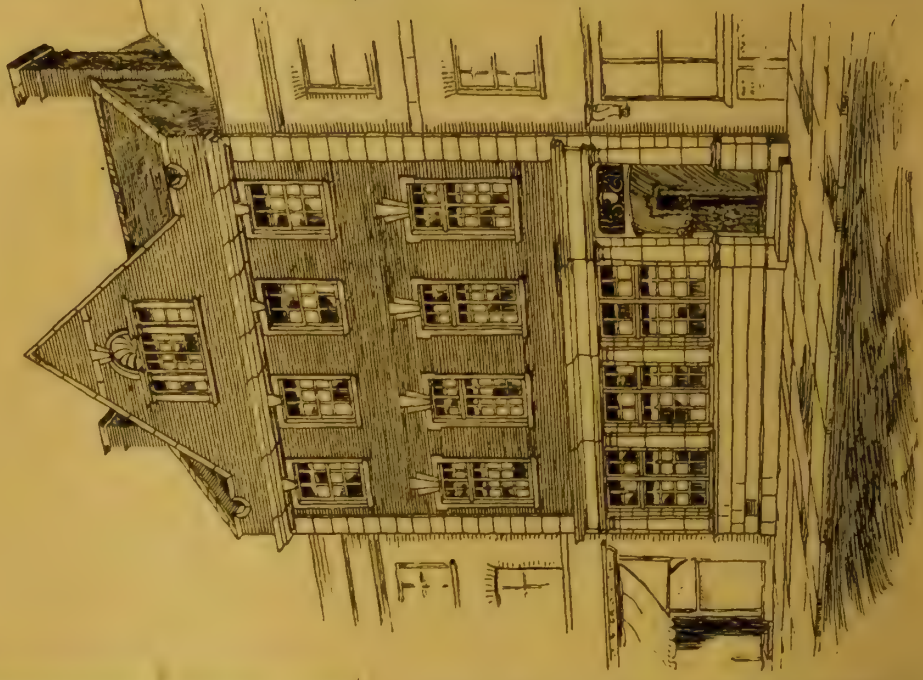
FIRST FLOOR



TRANSVERSE SECTION



SECOND FLOOR



PLACED FIRST









"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

NEW CO-OPERATIVE PREMISES BRIGHOUSE MESSRS SHARP & WALLER ARCHTS







THE BUILDING DEWS, JUNE 5, 1896.









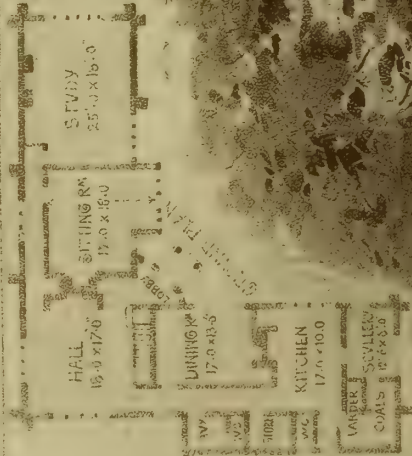
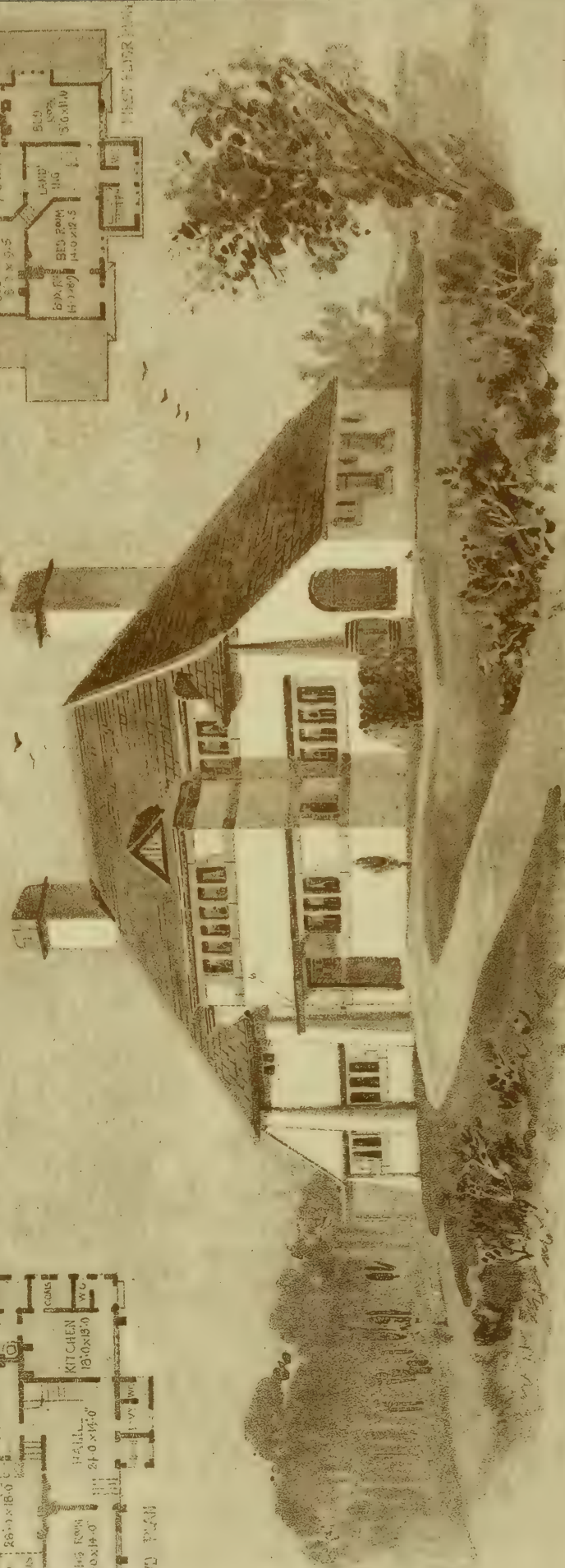
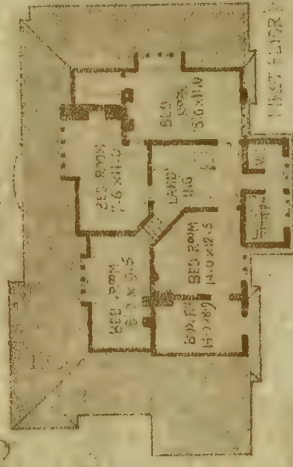
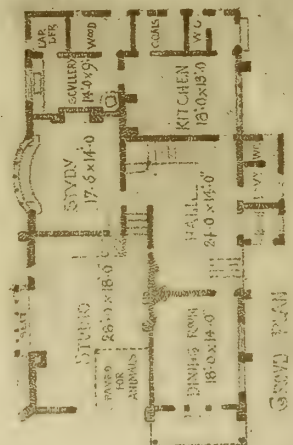








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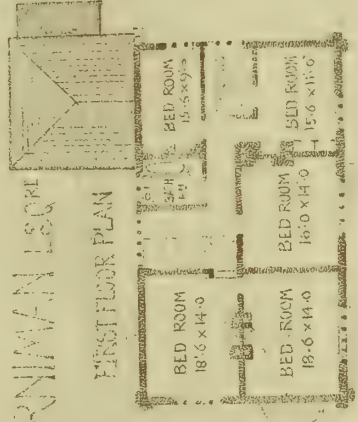
HOUSE FOR THE REV. C. VOYSEY ESQ PLATTS LANE HAMPSHIRE



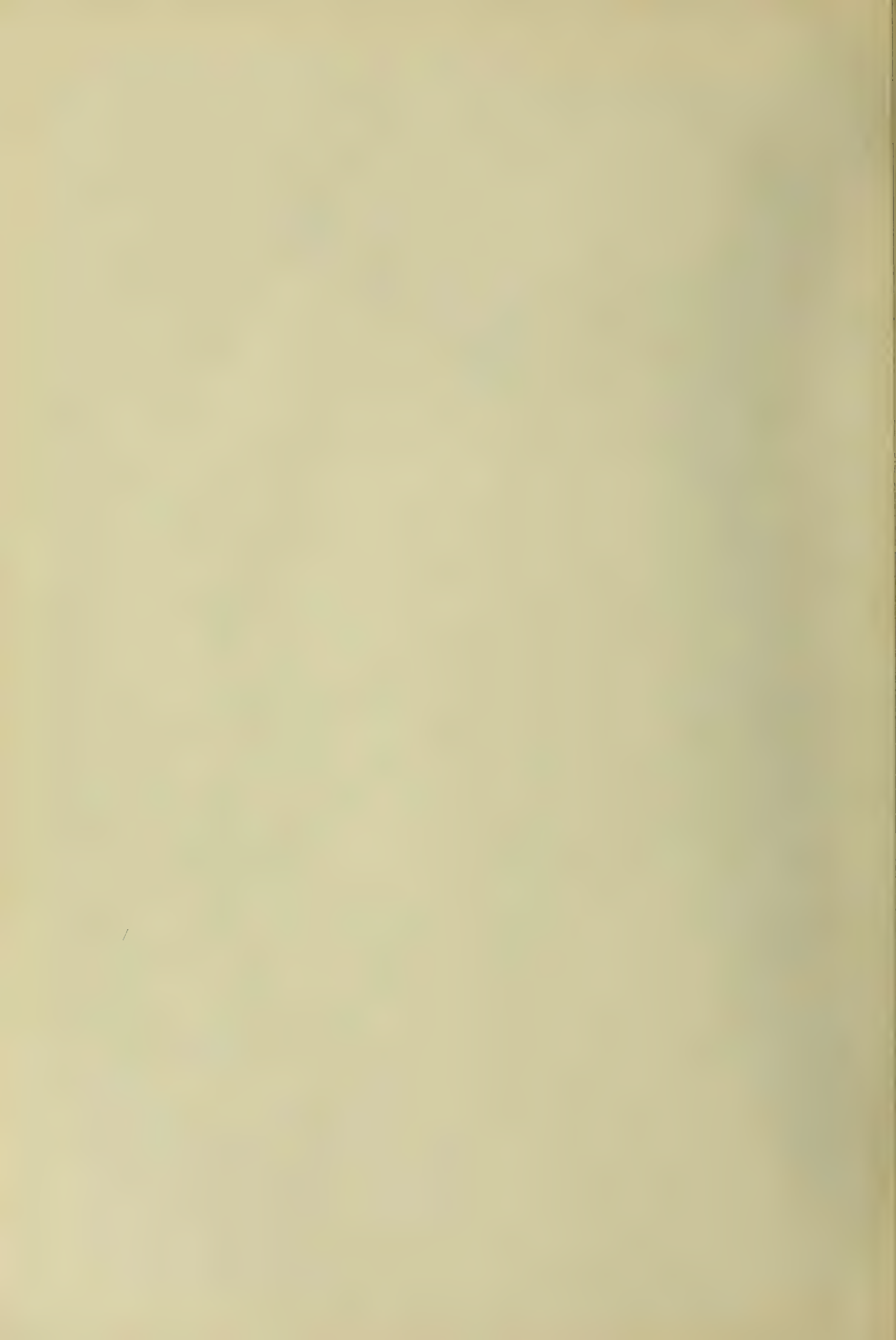




# HOUSE AT FRENCHAM - SURVEY FOR E.J. HORNIMAN ESQ.





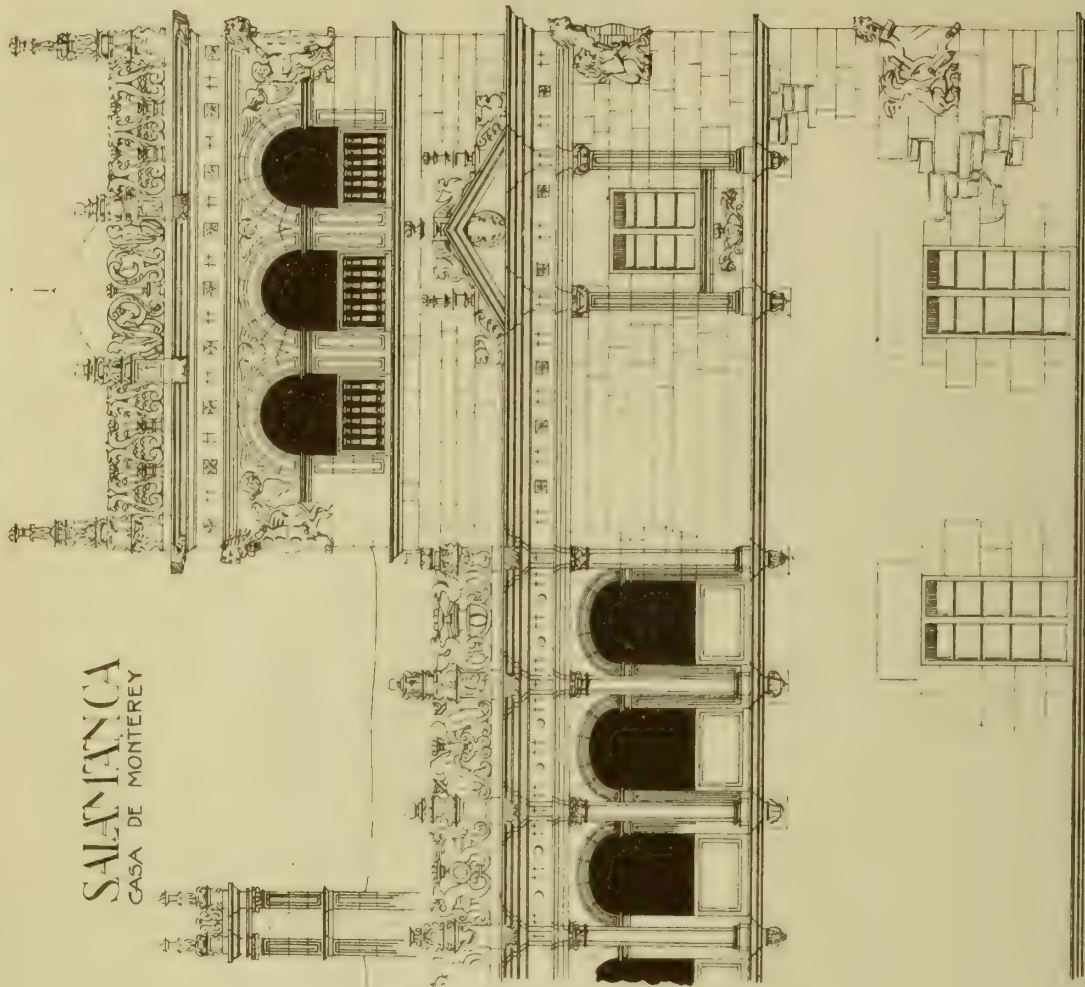




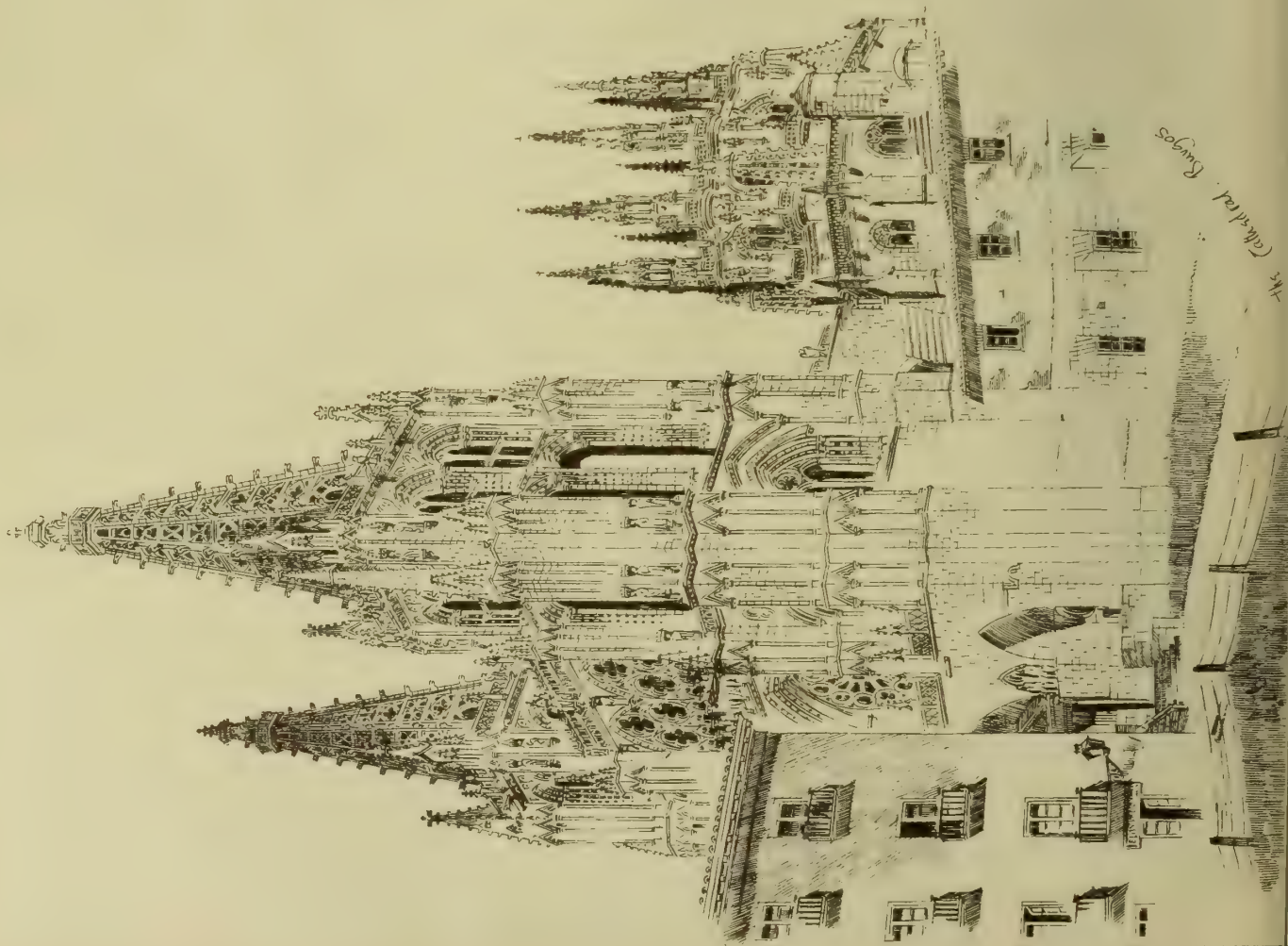




SALAMANCA  
CASA DE MONTEY



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# SIENA PAVEMENT



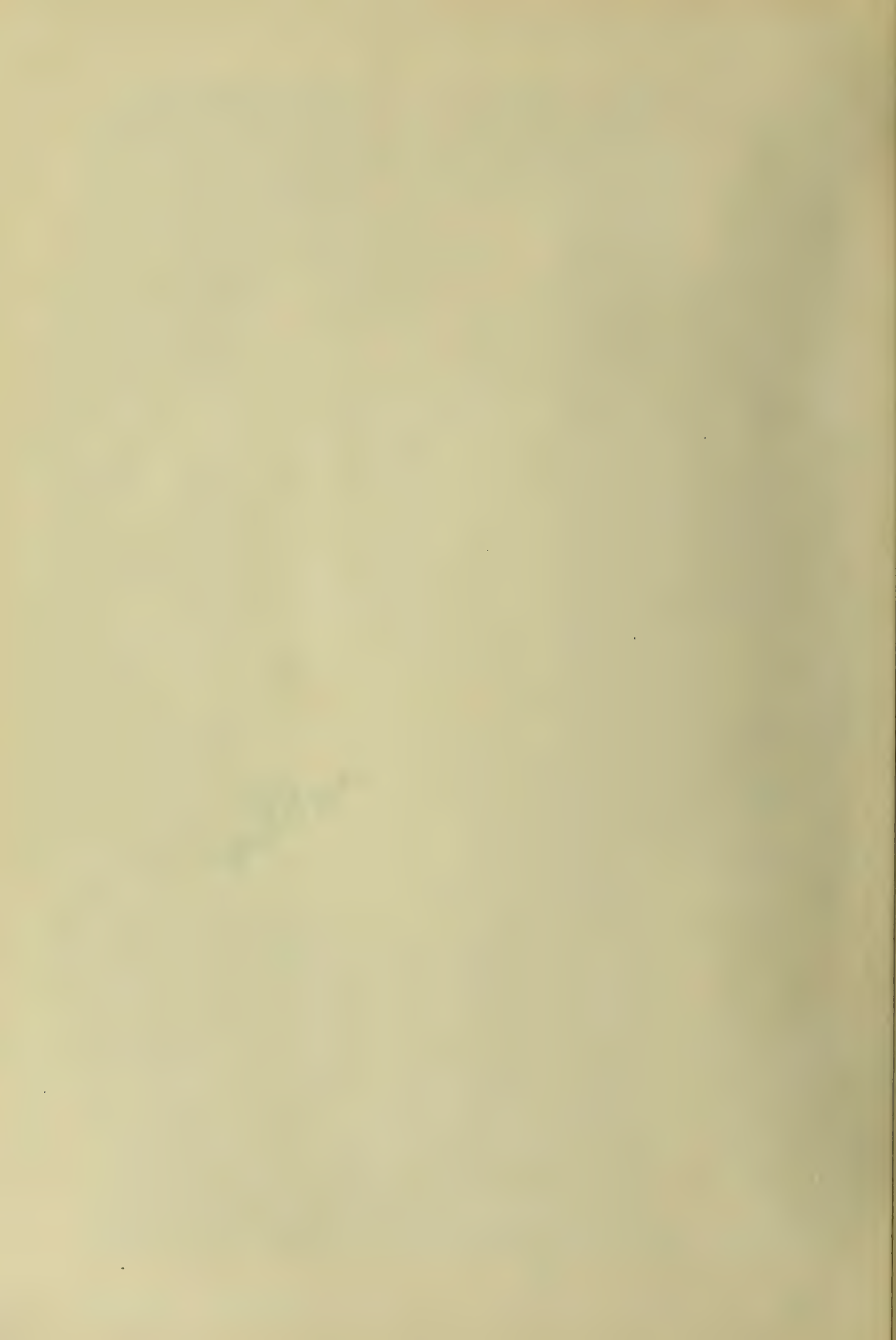
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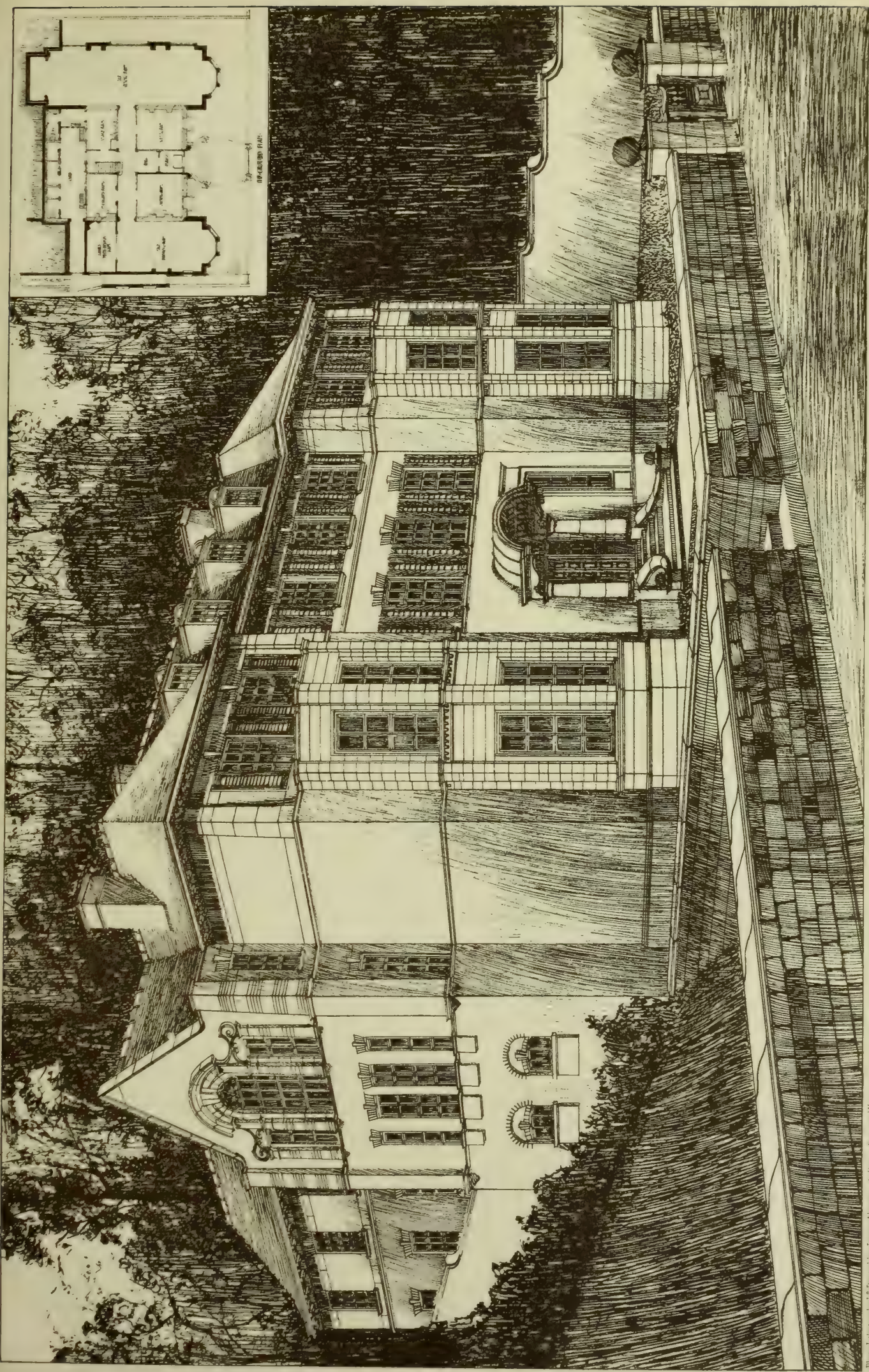
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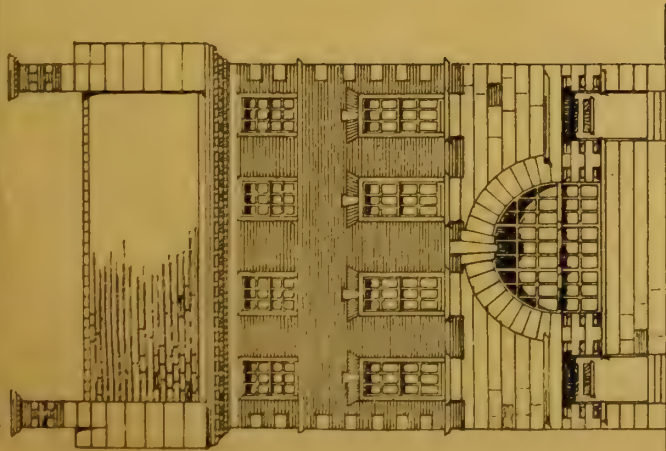


PARK LODGE, SCARBOROUGH. MESSRS HALL COOPER & DAVIS ARCHTS

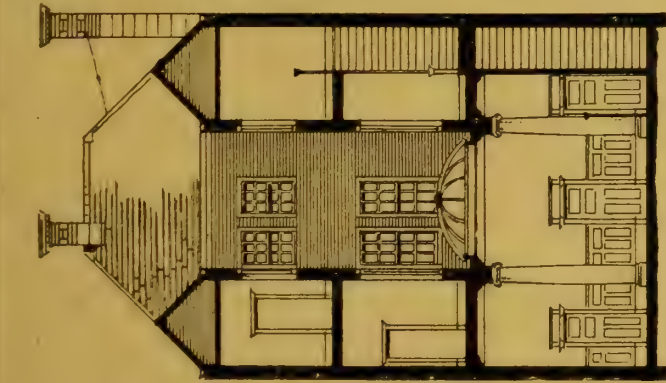




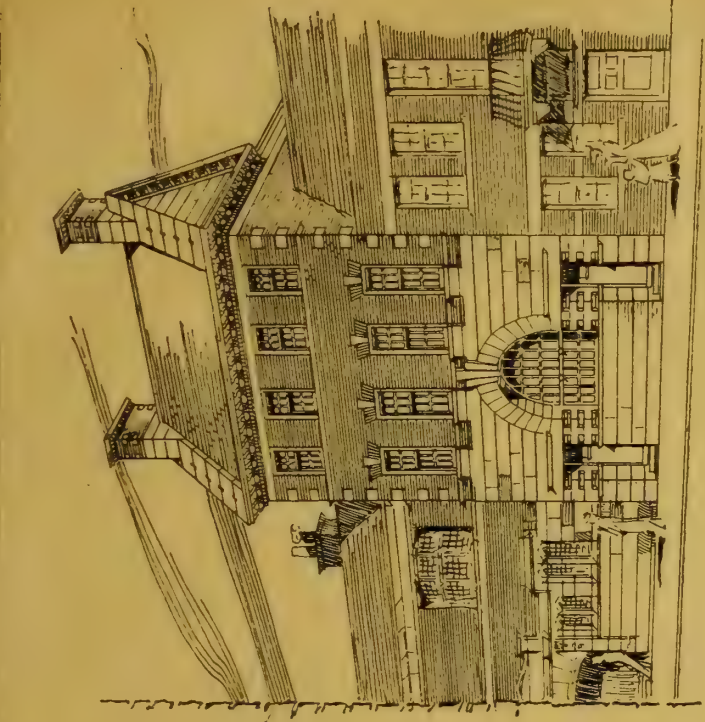




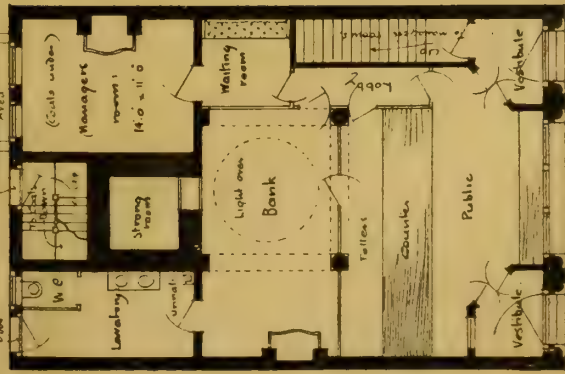
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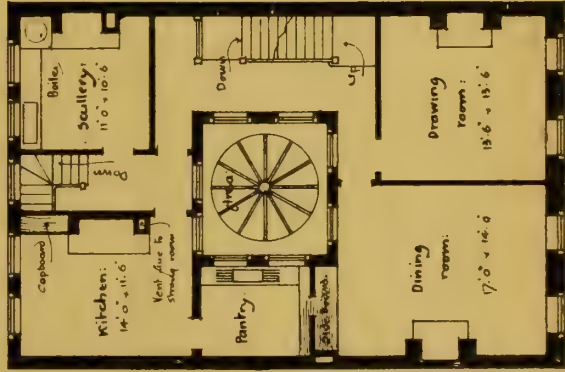
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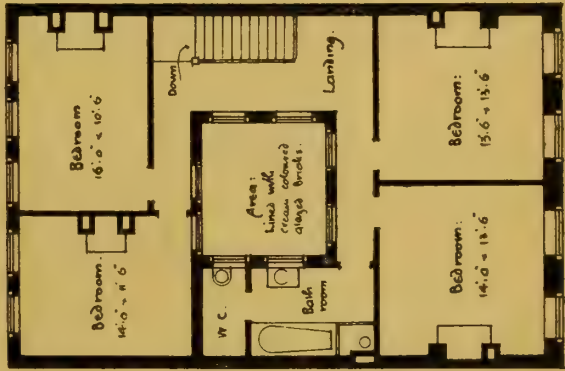
B.N.D.C.  
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BANK:  
BY THE  
OWL:



GROUND PLAN:



FIRST FLOOR PLAN:



SECOND FLOOR PLAN:

PLACED SECOND  
VIEW :





## Building Intelligence.

CANTERBURY.—Dean Farrar makes an appeal for the sum of £20,000 for restoration works at Canterbury Cathedral to mark the thirteen-hundredth anniversary of the baptism of King Ethelbert, the first Christian English king, by St. Augustine of Canterbury. In accordance with careful reports by the late and present architects—the late Mr. Ewan Christian and Sir Arthur Blomfield, A.R.A.—the most immediately necessary work is:—1, the clearance and restoration of the long-neglected crypt, which would then be once more available for religious services; 2, the repair of the cloisters; 3, the repair, sustentation, and restoration of the Chapter-house; and 4, the restoration of the ancient chapel of St. Andrew, which is now unsightly from neglect and disfigurement. The Dean thinks that, besides other works, one or more stained-glass windows should be erected to commemorate so remarkable a centenary. The total raised now amounts to over £9,000.

COVENTRY.—The old banking premises belonging to the London and Midland Bank (and formerly the Coventry Union Banking Company), situated at the corner of High-street and Little Park-street, Coventry, have been pulled down, and new premises have been erected by Mr. Charles Heywood, jun., Coventry, at a cost of £10,000, from the designs of Mr. Frank Barlow Osborn, architect, Birmingham. The frontage to High-street is 30ft., and to Little Park-street 90ft. The new buildings, which were opened for business on Tuesday last, have been designed in the Elizabethan style of architecture, are executed in Hollington stone and red bricks, and comprise, in addition to the banking premises, several suites of offices situated on the ground, first, and second floors.

HEATON, NEWCASTLE-ON-TYNE.—A new Presbyterian church at the corner of Heaton Park-road and Falmouth-road was opened on Wednesday. It adjoins halls and classrooms built in 1891 at a cost of £3,400, and has been erected from designs by Mr. W. Lister Newcombe, F.R.I.B.A., Newcastle, the contractor being Mr. G. Mauchlen, of the same city. The total cost of the site, church, halls, classrooms, and organ, has been £8,300. The church is Early English in character. It has turrets with staircases at each side of the road elevation, and an octagonal spire developed between the chief gable and the southern turret, which rises to a height of 88ft. The main entrance is placed between the two turrets, and is surmounted by a five-light traceried window. The electric light is fitted throughout. In a special chamber, designed for its reception, is a double manual organ with decorated case. The church will accommodate 900 persons. A board-room is situated behind the church holding 100 persons, besides a smaller classroom, and minister's vestry, lavatory, &c.

SELBY.—The abbey church of Selby has been further enriched by the restoration of the elegant sedilia (an almost exact *fac-simile* of which is to be found at Durham Cathedral). The new part of the work contains over 2,000 crockets, some being of the smallest description, but studied from those which were remaining on the old part. Mr. J. Oldrid Scott, F.S.A., the architect for the abbey, prepared the plans, and Mr. Ullathorne, builder, of Selby, was intrusted with the mason's part, whilst Messrs. M. Tuttell and Son, sculptors, of Lincoln, were appointed by the architect to execute the carving.

WALSALL.—The new public baths at Walsall were opened on Saturday. They are situated in Lichfield-street, and include first and second-class swimming-baths, slipper-baths, and Turkish baths, with a residence for the superintendent, ticket-office, boiler-house, wash-house, and all other necessary appurtenances. The slipper-baths number seven for women and 18 for men, and there is a Turkish-bath department. The building was erected by Mr. R. Merton Hughes, of Birmingham, from designs by Messrs. Bailey and McConnal, of Walsall.

A monument to Baron Friedrich Schmidt, the architect of the town hall at Vienna, was unveiled by the Archduke Rainer, on behalf of the Emperor, on Friday. It takes the form of a bronze statue over life-size, and is placed in front of the architect's masterpiece, the Rathaus. Herr Hoffman was the sculptor.

## Engineering Notes.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The Midland Counties district meeting will be held at Hanley, on Saturday, June 13, 1896. 11.30 a.m., meet at Town Hall; reception by the Mayor (Mr. Councillor Tunncliffe); paper by Mr. Joseph Lobley, M.Inst.C.E., borough engineer and surveyor of Hanley, entitled "Some of the Public Works carried out in Hanley during the last Ten Years"; discussion. 12.15 p.m., inspect Quarter Sessions Court and Victoria Hall, where light refreshments will be provided by the Mayor. 12.30 p.m., short organ recital by Mr. G. Barlow, borough accountant; after which the members will proceed to view:—12.45 p.m., Free Library and Boys' Reading-room, Technical Museum; 1.10 p.m., Markets and sub-stations; 1.30 p.m., Higher Grade School; 2.0 p.m., The Electricity Works; 3.0 p.m., Hanley Park (in course of formation), bridges, lodges, pavilion, terraces, lake, conservatory, &c.; 3.30 p.m., Sewage Works—inspect sludge presses and Bacillite Sewage Purification Syndicate's experimental works; 4.0 p.m., Stoke-road electric light cable laying, sub-stations and street improvement; 5.0 p.m., tea at North Stafford Hotel, near Stoke Station, 2s. each.

RAILWAY BRIDGES FOR BRANCH LINES.—At a meeting of the Society of Engineers, held at the Royal United Service Institution on Monday evening, Mr. G. Maxwell Lawford, vice-president, in the chair, a paper was read by Mr. M. A. Pollard-Urquhart, M.Inst.C.E., on "Examples of Railway Bridges for Branch Lines." The author referred to the number and variety of ordinary railway bridges everywhere erected, and proceeded to consider which type was most suitable, as combining economy with efficiency. He pointed out that small branch lines were what chiefly remained to be constructed in this country, and that the bridges under notice were mainly applicable to that class of line. He drew a comparison between bridges with box wings and those with splayed wings, showing the saving effected by using the latter form. The lecturer then proceeded to show the economy gained by using brick arches instead of girders for bridges carrying roads over the railway, but pointed out that this advantage was chiefly noticeable in single-line bridges, and to a great extent disappeared in double-line structures. The most suitable form of bridge under the railway was then described, and various forms of flooring were referred to. Some examples of bridges for occupation roads were then considered, the author pointing out that when only a small acreage was cut off from a farm, a timber bridge would be sufficient for the moderate traffic that would pass over it. He also alluded to the advantage of using trough girders to carry the railway over small spans, owing to the headway gained. Attention was then drawn to three types of bridges carrying a railway over water-courses, the cost of each of these structures, and the time taken in erecting them being given. It was then pointed out that to effect economy, cornices and pilasters should be avoided, and the bridge made as simple and easy to build as possible.

The terrace lately added to the south and west front of the Alexandra Hospital at Woodhall Spa was opened on Wednesday by the Hon. Mrs. Stanhope. The terrace has been designed by Mr. Temple Moore, architect, of London, and the work carried out by Mr. Cornelius Taylor, builder, of Lincoln.

Thomas Pratt Wills, late secretary of the Portsea Island Building Society, which closed its doors in December, 1891, with liabilities amounting to three-quarters of a million, died in Parkhurst Convict Prison on Friday night. Wills was prosecuted at the Old Bailey for fraud in connection with the society, and was sentenced to five years' penal servitude. He was to have been released from gaol next month.

At the last meeting of the Camelford Rural District Councillors, Mr. James Nicholls, auctioneer and surveyor, Padstow, acting as agent of the owner, the Rev. Edmund J. Walker, produced a plan of an hotel and building sites to be erected at Tynes, St. Teath, and on almost the highest point in Cornwall. Steps are about to be taken for the development of the land, which is situate about twenty minutes' walk from either Port Isaac-road or Delabole Railway Stations, and within a mile of the sea. The freehold land is to be sold in half-acre plots.

## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—A meeting was held at the rooms, 187, Pitt-street, on Tuesday, the 2nd inst., at 8 o'clock, when Mr. Alex. Orr delivered a paper on the "Designing of Wall-Papers." The process of printing by means of blocks was gone into and thoroughly explained by the essayist. Samples of these blocks were on exhibition, as also were the rollers used in printing machine papers. Designs by Messrs. Voysey, Morris, Crane, Sumner, Day, Gwatkin, and others were exhibited.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual excursion takes place on June 13th. Members will assemble at the Central Station, Newcastle, at 9.20 a.m., and travel by the 9.30 express to Beal. On arrival they will drive to Haggerston Castle, and after inspecting the works there will proceed, at 12.40 p.m., in conveyances to Holy Island. The vicar has kindly consented to conduct the party (upon arrival) over the priory and parish churches, after which they will dine together at the Northumberland Arms, Holy Island, at 5.30 p.m., and will leave the island in conveyances at 7.0 p.m., in time to catch the 8.16 express, arriving at Newcastle at 10.5 p.m.

### CHIPS.

At the Roman Catholic church of St. Thomas and the English Martyrs, in St. Leonard's-on-Sea, a new Lady-altar, designed by Mr. P. P. Pugin, and executed by Messrs. Boulton and Sons, has been solemnly inaugurated.

The gold medals of the Salon this season have been awarded to M. Benjamin Constant, for painting; M. Gustave Michel, for sculpture; M. Henri Lefort, for engraving; and M. Scellier de Gisors, for architecture.

At the next meeting of the Asylums Board, a committee will submit for approval a project for the purchase from the City Lands Committee of a large site on the Thames Embankment. For a sum well under £100,000 it is believed it will be possible, if the scheme is approved, to purchase the site and erect upon it a building suited for the business of the board.

Special services were held at St. Peter's Church, Ipswich, last week, in celebration of the completion of various improvements that have been carried out in the sacred edifice during the last few weeks. The church has been renovated by Mr. F. Bennett, and plain oak pews have been substituted for the chairs with which it was latterly seated, the work having been done by Mr. E. Catchpole, also of Ipswich. The cost will be about £340. Incandescent gas-burners have also been introduced.

At a general meeting of the Royal Institute of Painters in Water-Colours, Piccadilly, held on Monday evening, Messrs. J. Bernard Partridge, Arthur Burrington, E. Davies, Gordon Browne, Albert Kinsley, and Miss G. Demain Hammond were elected members.

The parish of Church Eaton is being sewered for the rural district council of Gnosall. Mr. Wilcox is the engineer, and Mr. Nevitt the contractor.

Mr. Charles Wakefield Jackson, the senior partner in the late firm of Jackson and Shaw, by whom the London University, the Grand Hotel, St. Pancras, the Memorial Hall, and the Records Office were built, died a few days ago at his Tulse Hill residence.

The foundation-stone of the new public hall which is being erected by Lord Derby in Knowsley Village was laid on Friday by the Countess of Derby. Occupying a situation opposite the Knowsley Church, the hall will cost about £5,000.

The amount expended by the Public Works Department, New South Wales, in bridges, schools, public buildings, jetties, hospitals, &c., including additions and repairs, was £160,000 for the last financial year. The expenditure for the year in the Government architect's office in the same colony amounted to £181,714, as compared with £250,964 in the preceding year. The buildings erected and in course of construction for the Hospital for Insane at Goulburn will cost £63,000, and the Government have resolved to vote £30,000 per annum until the asylum, which is to cost £150,000, is completed.

Mr. Henry Lovatt, builder, Wolverhampton, has obtained the contract for the erection of the new theatre for Mr. Beerbohm Tree in London.

The Earl of Lonsborough laid, on Tuesday week, the foundation-stone of the extension of the National Schools at Selby, now being carried out as a memorial to the late Canon Harper. The contractor is Councillor Ullathorne, of Selby.

The parish church of Great Harwooden is in course of restoration. The contractor is Mr. George Henson, of Wellingborough.



## THE A.A. DINNER.

THE forty-eighth session of the Architectural Association was brought to a close on Friday evening by the annual dinner, held at the Holborn Restaurant. Mr. W. D. Caröe, M.A., F.S.A., the President retiring from office, occupied the chair, and was supported by Professor George Aitchison, A.R.A., Messrs. Talfourd Ely, M.A., J. M. Brydon, A. W. Weedon, W. H. Jamieson, H. B. Ransom, F. W. Pomeroy, Harvey Flint, Mr. A. Beresford Pite (the president-elect), Messrs. F. T. W. Goldsmith and G. H. Fellowes Prynne (vice-presidents), and by many members. A popular feature of the evening was the singing of some of the more taught numbers in the "Celestial Institute" musical soirées, given a fortnight previously. These ballads, duets, and choruses were rendered by Messrs. S. Constanduros, A. Stalman, G. D. Carvill, and others, the accompaniments being played by the composer, Mr. Leonard Butler. The loyal toast having been honoured, the chairman gave that of "The Royal Academy and the Royal Institute of British Architects."

Professor AITCHISON, in replying, claimed that the Academy had done a great deal for the arts of painting, sculpture, engraving, and even for architecture by the free school for students it had established and maintained; indeed, it was the first public body in this country to organise art training, and to provide travelling studentships, so that he claimed for it the gratitude of architects. Turning to the Institute of Architects, it was curious to note that their late friend, Professor Donaldson, in founding that body, although an ardent admirer of Classic architecture, promoted a return on the part of architects to the Mediæval mode of practice. Most of the architects practising at the time when the Institute was formed were like the great builders of the Renaissance period, also contractors. Donaldson, in establishing that Institute, caused a reversion to the practice of the Middle Ages by restricting architects to their own sphere of labour, and at the same time provided a local habitation and a name for the profession, and a central body to regulate procedure and to which bequests could be made. He claimed that the great improvement in the architecture of the Metropolis dated from the period of the establishment by the R.I.B.A. of the compulsory examinations in architecture, and expressed a hope that this progress would be still more markedly manifest in the future.

Mr. J. M. BRYDON proposed the toast of the evening, "The Architectural Association," remarking that the future of English architecture lay in the hands of the earnest band of students who worked in the A.A. classes at what he might call the Co-operative Stores in Great Marlborough-street. He was glad to hear that the slight falling-off of the previous session had been more than made good, and that the Studio was now succeeding admirably. From the very beginning the Association had been an educational body, and he hoped that whatever changes took place in providing technical instruction, the training of architectural students would not pass into any other hands but those of the A.A. He congratulated the members on the distinguished roll of men who had occupied the presidential chair, men who were leading the movements of the day. Mr. Caröe had well sustained its reputation, and the coming president was a very worthy follower in that position. He trusted that the president would ever first be an artist, and one who would hold the great star of architectural excellence as its chief aim and endeavour. The prosperity of the Association was at the bottom of everything, and the sole aim of their gathering. In coupling with that toast the name of Mr. Caröe, he would add that their president had had a very trying year; but he had the satisfaction of leaving the Association in a better position than when he came to the chair. In the words of the rousing final chorus in "The Celestial Institute" he would say, "Let every loyal student join our gladsome lay, And sing in triumph to our great, our glorious A.A."

THE PRESIDENT responded in brief terms, and expressed his regret at the absence of Mr. E. W. Mountford, his predecessor in the chair, owing to illness. The success of the future would depend, as in the past, on the united and harmonious working together of instructors, students, and members for the good of the Association, for there was now increasingly keen competition to face with other educational bodies.

Mr. THOMAS DREW, R.H.A., of Dublin, president of the Royal Institute of Architects of Ireland,

in a humorous speech, proposed the healths of the Instructors, associating with the toast the name of Mr. F. W. Pomeroy, for the last four years the head of the modelling class, who replied, referring to the difficulties occasioned by the rivalry of polytechnics and educational facilities supported by other bodies. He urged students not to make the winning of prizes their chief aim.

Mr. THOMAS BLASHILL, as a past president of thirty-two years' standing, proposed the health of "The Visitors," which was acknowledged by Mr. Talfourd Ely. The next toast, that of "The President Elect," was proposed in eulogistic terms by Mr. FELLOWES PRYNNE, who also referred to the excellent work, both educational and social, which is being carried on by the Association. In responding, Mr. BERESFORD PITE, who was received with musical honours, observed that their main work was the dry task of education, and although they were all apt to think that the point to be aimed at was the passing of examinations, that was not the case. Did they cease to provide education, the very soul and lifeblood of the Association would be dried up. There was room enough for all ideas and all schools on this subject. The work of the Association was the sowing, planting, nourishing, and bringing to fruition of the divine afflatus of enthusiasm. Art without enthusiasm died, and where would they find that enthusiasm more freely manifested than in the fellowship and classes of the Association. The vast majority of young men were in mere commercial offices, where they saw only bad architecture. He confessed that for years he was groping in the dark till the reading of the life of Augustus Welby Pugin fired his zeal. This enthusiasm made routine work a pleasure for its own sake, and converted daily drudgery into a delight. With this as its goal, the Association had a future before it which no other body could achieve. It was the only body that could found a school of design, and persuade men to put their best powers into their architecture. They had the power in their own hands, and all the means and facilities at command, and in the coming generation this was sure to tell.

Mr. E. HOWLEY SM proposed the toast of "The Retiring Officers," associating with the toast the names of Mr. Goldsmith, vice-president, Mr. A. H. Hart, hon. secretary, and the President. All responded, the President closing with some lines written by a gentleman who, though unfortunately not a member, was known as "the poet of the Association" (Mr. H. Devey Browne), of which the first verse ran:

"Dear friends, and brothers—shall I say in Art?  
Though that's a word of which we're rather shy.  
In Craft!—some day the best of friends must part—  
Good-bye."

## MEDALS AT THE SALON OF THE CHAMPS ELYSEES.

ON Friday and Saturday last, the medals of honour at the Salon of the Champs Elysées were awarded as follows:—In the section of painting the votes were very closely divided between MM. Benjamin Constant, Harpignies, and Henner; at the third round of voting, however, the majority awarded the medal of honour to M. Benjamin Constant. This artist exhibits at the Salon of this year a very fine portrait of his son André, a work which has just been bought by the State for the Luxembourg Museum. M. Constant was born in 1845, and became a pupil of the Ecole des Beaux Arts in 1867. He won medals at the Salons of 1875 and 1876, was appointed Chevalier de la Legion d'Honneur in 1878, Officier in 1884, and later on Membre de l'Institut. His *chef-d'œuvre* are numerous and well known, notably the "Derniers Rebelles" at the Luxembourg Gallery.

The medal of honour in the section of sculpture was carried off by M. Gustave Michel, after a keen competition with M. Gardet. M. Michel exhibits a fine group, entitled "The Blind Man and the Paralytic," and a statue, entitled "Pensée."

M. Scellier de Gisors takes the medal of honour in the section of architecture. He exhibits his designs for a central depot for the Posts and Telegraphs, and a monument to Admiral Coligny. M. Scellier de Gisors, born in 1844, was student of the Gisors atelier at the Ecole des Beaux Arts, where he carried off the Prix Rougevin, the Prix Leclerc, and also the second Grand Prix de Rome, and conducted the excavations of the Mount Palatine in 1869. He carried off a medal at the Salon of 1876, and was

later on inspector to the Palaces of the Louvre and Tuileries. He is the architect of the new Luxembourg Gallery.

No first medal was awarded in the section of painting; amongst those who receive second medals are the names of MM. Lorimer, Gotch, Henri Cain, and Paul Chabas.

First medals were awarded in the section of sculpture to MM. Gasq and Mengue.

In the section of architecture, first medals were awarded to MM. Sortais, Delaunay, Ypermann, Dusart, Boussac, and Dupont, and second medals to MM. Emile Bertone, Chiffot, Adrien Rey, and Bourdon.

Paris, June 1. ARTHUR VYE, PARMINTER.

## MODERN OPERA-HOUSES AND THEATRES.\*

THE large and handsome volume which has been brought out under the joint authorship of Mr. Edwin O. Sachs, architect, and Mr. Ernest A. E. Woodrow, A.R.I.B.A., is the first of three volumes on this important class of buildings. Each volume is 23in. by 16in., and is printed on fine paper, bound in buckram gilt. The series of illustrated articles which we have given lately from the pen of Mr. Woodrow have anticipated in some measure the handsome volume which is now on our desk, and which is intended as a "continuation of the valuable atlas on theatres published by M. Contant in 1842, and in April last year we published a selection of plans and sections from this work. It is impossible in a brief notice to adequately deal with the subject and the exhaustive treatment which the authors have given. Of course, the selection made is typical, and limited to those playhouses that are of special merit on the Continent and in Great Britain, and these have all been visited. The architect engaged in this branch of his profession has hitherto been at a loss to obtain plans and illustrations of the leading Continental theatres, and has often had to make journeys to inspect them at much cost of time and labour; but this work will enable him, within the confines of his office, to examine and compare the plans and sections and elevations of all the leading opera-houses and theatres in Europe, drawn to such a scale as to give him every detail. The examples which are reproduced by photo-lithography from original line drawings specially drawn, comprise theatres and opera-houses in Austria and Hungary, including the Court Theatre, Vienna, six in Germany, comprising the Municipal Theatre at Halle, the "New" Theatre, the "Linden" Variety Theatre, Berlin, and the Peoples' Theatre at Worms; five leading theatres in London, D'Oyley Carte's Opera-House, Daly's Theatre, "Travellers" Theatre, "Grand" Theatre, and the "Alhambra" Variety Theatre, besides examples of recent opera-houses and theatres in Holland and Belgium, Norway and Sweden, and Russia. There are 100 plates and 93 illustrations in the text. The plans and sections are given to a scale of 1/4in. to the foot, and the details to a larger scale, and the authors have made a comparison of the relative sizes of those buildings easy by the block plans in the text, which are given to a uniform scale. The St. Petersburg proposed Court Opera-House covers the largest area, the second next in size being the Court Opera-House, Vienna. The descriptive text furnishes every particular of each of the examples illustrated, the approximate dimensions of the proscenium, the auditorium, and stage, and each is illustrated by perspective sketches and photographs and details of the internal portions. So large and laborious an undertaking demands special recognition. For three years, Mr. Edwin O. Sachs tells us in his preface, a staff of draughtsmen has been busily engaged in preparing illustrations and plans, whilst Mr. Ernest A. Woodrow's association in the work has been invaluable. The latter gentleman's experience in the Theatre Department of the London County Council has been of particular value in all matters of detail and legislation.

The extent and scope of Messrs. Sachs and Woodrow's work has been much increased since its first inception. The introductory remarks deal with the leading classes of theatres—(1) court theatres, (2) national theatres, (3) municipal theatres, (4) subscription theatres, and (5) private theatres. Of each class typical

\* Modern Opera Houses and Theatres. By EDWIN O. SACHS, Architect, and ERNEST A. E. WOODROW, A.R.I.B.A. London: B. T. Batsford.



plans are illustrated. An important distinction between grand opera and dramatic performances is pointed out. "To enjoy drama the audience must be in close touch with the actors"; every gesture should be seen, every whisper heard. At the opera the gesture and expression of the artist are not so important as the general harmony, and more room is wanted on the stage for scenery, choruses, and ballets. Most Government and Court theatres are opera houses; the private theatre is the home of the drama and burlesque. As the authors point out, the most successful examples are those which have arisen through an evolutionary process, and the plan of the Old Dresden Opera House has been gradually elaborated till the lines of the Vienna Court Theatre were reached. A further development is the proposed St. Petersburg Opera House, the design and plans of which, by Victor Schroeter, form the last plates of the present volume. We have also here the Municipal Theatre, Odessa, another fine example of lounge and stair planning, with external loggias, by F. Fellner and Hermann Helmer, both of them based on the Old and New Opera Houses, Dresden, and the Vienna Court Theatre. The latter is probably the finest example of its class on the Continent; it has already served as a model in theatre design and planning. It has a noble suite of reception-rooms, and is regarded with pride by the Viennese. The exterior is of Classical and palatial design, and the central feature or entrance, illustrated in the text, is imposing. Details of the staircase, wings, proscenium boxes, lounge, and grand staircase are also given. Gottfried Semper and Baron Hasenauer were the architects, though the former conceived the design. As in all the best work of this class, full expression is given to the plan and lines of the auditorium and stage in the exterior—a point which has not been attended to in our London theatres. The plates illustrating the Court Theatre, Vienna, number fifteen, and occupy a large portion of the volume, and are excellent examples of draughtsmanship, the sections and details of auditorium, &c., being exceedingly elaborate and complete. Other notable examples are the Court Opera House, Dresden, a palatial structure in the Palladian style, with curved grand vestibule and projecting *porte cochère* on each side. The Municipal Theatre, Halle, is a smaller but well-planned theatre. We have said enough to show the extent and completeness of Messrs. Sachs and Woodrow's great work. In most cases, besides views and elevations, plans are given of every tier, besides sections and details describing the construction, ventilation and warming, and the decoration. The volumes to follow will be increased in size, and will take up the questions of planning, stage machinery and appliances, and theatre legislation. The work is an ambitious one, but the way in which the authors' intentions have been fulfilled in the volume now before us augurs well for the undertaking. The printing and style of get-up are worthy of the authors and their publisher, and we hear an *édition de luxe* is to be published at 25 guineas.

#### CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXV.

By JOSEPH HORNER.

**T**HE cast-iron shoes for the timber trusses of roofs are articles in common use among builders. Large numbers are often wanted, and

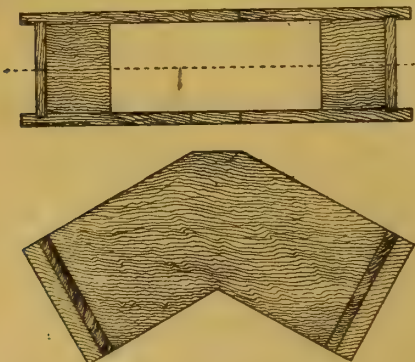


FIG. 100.

it is well, therefore, that a builder should know how to make patterns for the same. Two ordinary forms were shown on p. 200. The patterns

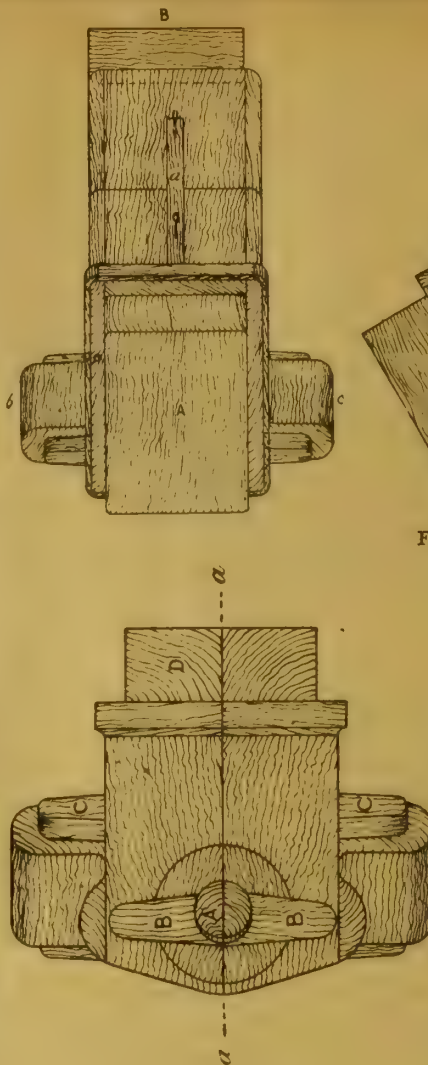


FIG. 99.

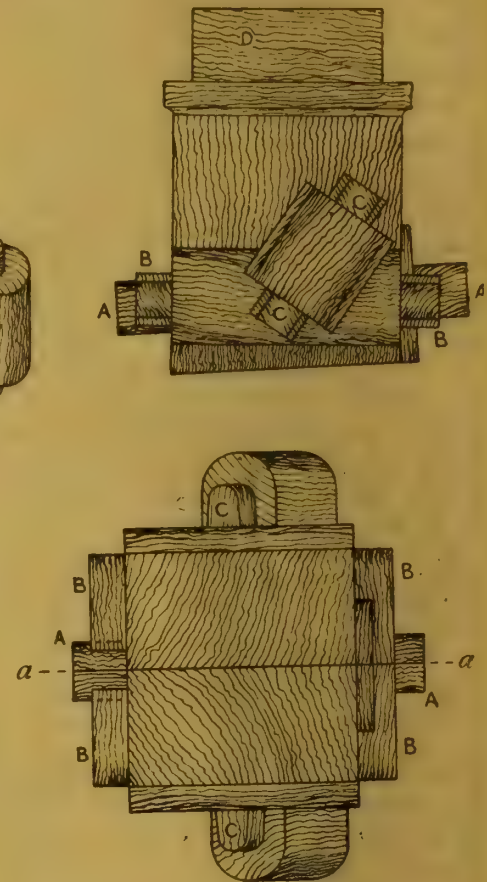


FIG. 102.

for these are here illustrated, and just as much of the moulds as is necessary to render the relations between pattern and mould clear to the reader. Having shaded the drawings and indicated minutely just how the patterns are constructed, I will not dwell upon these points of detail, but go through the broad principles involved in the work. Further, although the constructions shown are not the only ones which might be adopted, there would be no advantage in discussing alternative methods. Those shown are, in my opinion, the best, and are taken from my own practice.

Fig. 99 is the pattern for the shoe in Fig. 61, p. 200. It is boxed up as shown. The ribs *aa* are left loosely skewered on, the top lugs *bb* are dowelled on, the bottom ones *c* screwed on. Pocket prints are fastened on the lugs to core the holes for the truss rods. *AA* are prints for coring the holes for the main rafters, *B* is for the ridge pole. The patterns mould flatwise, and the moulder's joint is level with the upper face. Fig. 100 is the core-box for *AA*. The one for *B* is not shown, being simply plain rectangular. Fig. 101 shows the lower portion of the mould opened in the joint face, with cores in position.

*A* is the main core made from the box, Fig. 100, and *B* is the small core. A portion of *A* is broken away in order to show the fixing of the core *C* in one

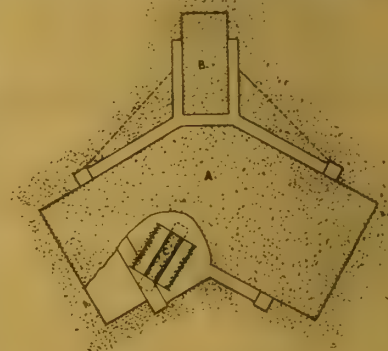


FIG. 101.

of the tie-rod lugs. The cores in these lugs are inserted previously to the insertion of the core *A*. Fig. 102 is the pattern for Fig. 62 on p. 200.



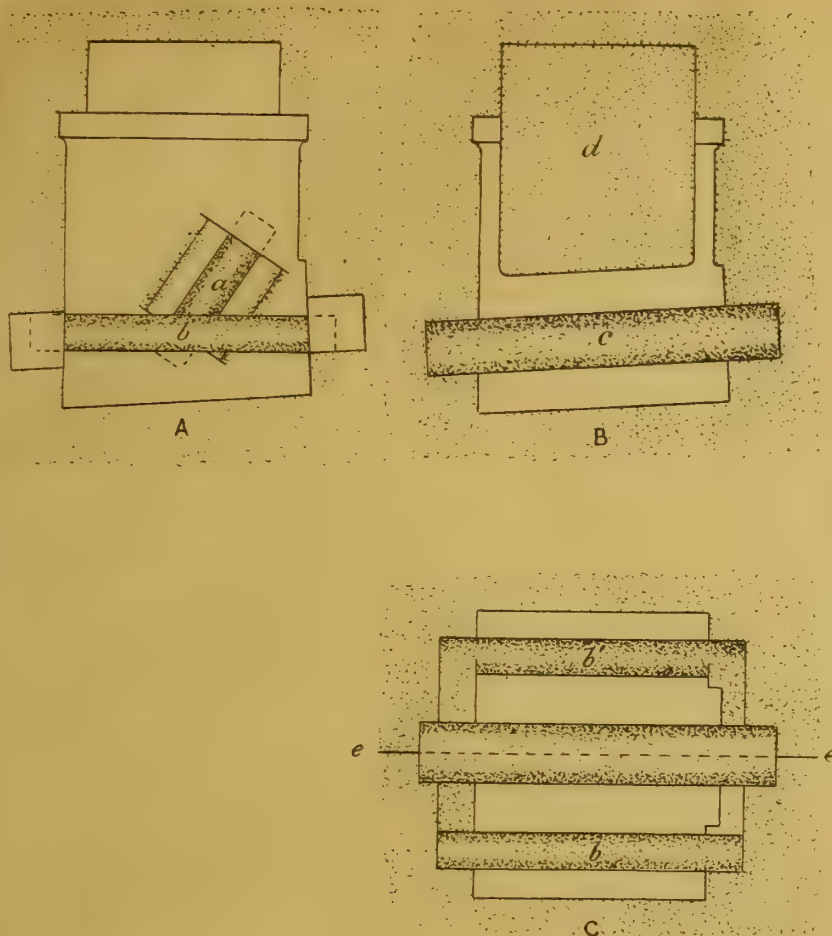


Fig. 103.

The pattern and mould for this are not so simple as the previous example. The casting has to carry five tie-rods, and three of these are superimposed, as the pattern moulds, the pattern joint being in the plane *aa*. There is only one of these holes for which a round print can be used, A. The others, BB and CC, have pocket prints; D is the print for the timber post. Although the pattern has a complicated appearance, yet, if made in this manner, it will be right for the foundry. Everything is nailed or screwed fast. Boxing up is not necessary. If large numbers are wanted, core-boxes should be made for each hole, but this is not necessary for a few castings. Portions of the mould are shown in Fig. 103. At A a plan of the mould is shown, in which the core *a* is inserted in a lug, in the print impression C in Fig. 102, and a core *b* for the smaller tie-rods, in the print impression B in Fig. 102. At the next stage, shown at B, the core *c* is inserted in the print impression A, Fig. 102, and the core *d* in the print impression D, Fig. 102. At C a transverse section is given through the cores *b* and *c*, *ee* being the joint of the mould corresponding with the joint *aa* in Fig. 102. Both methods of fitting cores into pocket prints are shown in this figure, *b* is a plain round core stopped over, *b'* is a core made in a special box to stop itself off. As nothing more troublesome than this can arise in connection with roof shoes, I need not extend these illustrations, but will conclude my remarks on pattern work with two or three miscellaneous examples in the next.

#### OBITUARY.

MR. JAMES CLARKE, of Hillside House, Rawtenstall, waterworks manager for the Rossendale district (which includes Haslingden, Rawtenstall, and Newchurch) of the Bury Corporation's water supply scheme, died at his residence on Tuesday week, in the 59th year of his age. In 1867 Mr. Clarke, who had been articled to Messrs. Williamson and Co., mechanical engineers, Kirkby Lonsdale, entered the service of the Bury and Radcliffe Waterworks Company as assistant collector, and was located at Prestwich. In 1872 the company purchased the rights of the companies at Haslingden and Rawtenstall, and Mr. Clarke was appointed local manager and took up his residence at

Rawtenstall. The Bury Improvement Commissioners took over the rights of the company, and in 1876, when the borough of Bury was incorporated, the rights were of course transferred to the corporation. Mr. Clarke was active in the scheme which resulted in the formation of the reservoir at Cloughbottom, and he was among those present at the opening ceremony on the 7th ult.

#### CHIPS.

A stained-glass window of four lights has been placed in the south aisle of the parish church of Malpas. The subjects are full-length figures of Saints Columba, Andrew, Cecilia, and Agnes.

At the sale last week of the *Daque de Osuna's* pictures at Madrid, Mr. E. J. Poynter, R.A., the director of the National Gallery, bought for that institution two works by Francisco Goya, an 18th-century Spanish painter (1746-1832), hitherto unrepresented at Trafalgar-square; one of the pictures represents a picnic party, the other a weird scene of sorcery.

Among the new justices of the peace for Birmingham sworn in on Friday was Mr. T. Barnsley, builder and contractor.

The committee of the free library for Edinburgh have received as a gift from Professor Masson a bust of Thomas Carlyle. It was executed by J. D. Cruttenden, a pupil of Foley, in 1873, about eight years before the death of Carlyle. The bust was in the possession of Carlyle himself, and was one of two copies which were taken at the time.

The members of the London Architectural Association will pay an all-day visit to Ipswich on Saturday, the 20th inst.

In the House of Commons, on Monday, the Westminster Improvements Bill, which stood for second reading, was withdrawn.

The Roman Catholic Church dedicated to St. Cuthbert, which has just been erected at Slateford-road, Edinburgh, was opened on Sunday in presence of four prelates with their attendant clergy. The church, which will accommodate about 600 persons, has been designed in the Early English style by Messrs. Buchanan and Bennet, Edinburgh.

Business at the Estate Market, Tokenhouse-yard, was affected last week by the Whitsun holidays, but, nevertheless, reached the satisfactory total of £71,016.

#### COMPETITIONS.

MAUCHLINE, N.B.—A memorial of the executive of the National Burns Memorial Committee was held on Tuesday week in the Christian Institute, Glasgow. A report was read from Mr. Robert Scott, measurer, on the five plans selected by Bailie Ramsay, Greenock, and Mr. Hamilton Marr, Govan. It was decided that the plans marked No. 7 should be awarded first place, and those marked No. 10 second place. On the envelopes containing these plans being opened, it was found that the successful competitors were (1) Mr. William Fraser, A.R.I.B.A., 248, West George-street, Glasgow; and (2) Mr. James Rome, jun., Mansfield, Kilmarnock. Mr. Fraser will have the carrying out of the work, and Mr. Rome is awarded the premium of £10 offered by the committee. The meeting appointed a building committee, with instructions to have the work gone on with as expeditiously as possible, with a view to the laying of the foundation-stone on July 23 next. The treasurer reported that the subscriptions now amounted to £2,350.

PURDYBURN, BELFAST.—The Board of Control of Lunatic Asylums have recommended the invitation of competitive designs from architects practising in Belfast for an additional asylum to be built at Purdyburn, for the Belfast district. Plans were desired for a complete asylum for 1,000 patients of both sexes; but it was explained that only the portion of it required for the accommodation of a limited number of chronic cases is to be built at present. A special meeting of the governors of the asylum was held at Belfast, on Friday, last, "To receive report of committee regarding competitive plans for new asylum at Purdyburn as arranged with deputation from the Board of Control." The report of the Purdyburn committee stated that after hearing explanations by Mr. Roberts, C.E., representing the Board of Control, they decided to build for 360 patients only at present, accommodation to be provided in a chronic block and a hospital block, each of these wards accommodating 60 patients per ward, with a dining-room for each block. The deputation from the Commissioners of Control informed the committee that, from their experience of an open competition for Portrane Asylum, Dublin, the procedure was the cause of delay, trouble, and expense, and was somewhat unsatisfactory. They suggested the desirability of naming a few Belfast architects for selection by the Commissioners of Control, and that the competition should be limited to one sketch plan and one elevation. With the view of avoiding delay and expense, it was unanimously resolved "That the Board of Control be requested to adjudicate on the competition plans sent in, and if any difficulty should arise that an English or Scotch architect of standing be asked to consult in reference to same." The deputation explained that the Board of Control had a fixed scale of architects' fees sanctioned by the Treasury of 4 per cent., and which, considering the nature and amount of the work, was not a high rate, and recommending the committee to agree to same. After discussion, it was agreed the architect's fees should be 4 per cent., excepting machinery, lighting, and other works of that character, regarding which the Board of Control should reserve the question of fees. It was arranged the sketch plans should be capable of future extension to 1,200 or 1,500 patients. Three months were allowed for preparation of plans. It was expected the design would be chosen, and the matured plans and specifications prepared, in time to begin building operations by the 1st March next. After a long discussion, the committee's report was adopted, with the exception of that relating to the selected architect's fees, which were reduced from 4 to 3 per cent. in the outlay, this reduced commission to include travelling expenses and every other item. At the meeting on Monday of the Belfast Corporation, a resolution was brought forward endorsing the action of the representative of the corporation on the Board of Asylum Governors; but a heated and personal discussion was abruptly terminated amid great disorder by a count out.

The governors of the Bedford Infirmary, at a meeting on Monday, finally adopted designs by Messrs. Stephen Salter and Adams, of London, for the new county hospital, to be built at Bedford at an estimated cost of £26,300, as recommended by the assessor, Professor T. Roger Smith. Towards the cost of the new building about £23,000 has already been collected.



## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 382, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

## SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. All Situation Advertisements must be prepaid.

## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIV., LVIII., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—F. Ranham.—Liverpoolliam.—B. N. and Co.—C. J. Reed.—B. W. S.—E. H. (Taunton).

## Correspondence.

## QUANTITY SURVEYING AND ITS ABUSE.

To the Editor of the BUILDING NEWS.

SIR,—The question of quantities in relation to contract, notwithstanding the subject has been so often discussed, seems still unsettled. There is little doubt that the quantity surveyor is regarded by the ordinary employer as somewhat of an interloper. The public cannot quite understand what his functions really are; he is usually employed by the architect, with or without the concurrence of the employer—it does not seem to much matter which—for he does not have any direct dealings with him, though his charges are sometimes looked at askance.

The quantity surveyor, nevertheless, is a necessary functionary in building operations, and as such his position ought to be recognised by both parties to a contract. I, therefore, think the opinions of your correspondents, Mr. Kinder, "A Country Contractor," and "A Provincial Surveyor," deserve the attention of your readers.

As the last-mentioned writer said, the matter should be taken up by London and provincial surveyors, and an effort made to establish a Building Surveyors' Institute on its own basis. By forming an institution of their own, the quantity surveyors, especially those in the provinces, would be able to discuss their grievances more satisfactorily than they can do in mixed architectural societies, and be able to come to an agreement about many points of practice which they are debarred from discussing now. As Mr. Kinder says, uniformity of practice in the preparation of quantities is very much to be desired.

At present architects and surveyors are divided on the question. Many of the former prefer the

employment of an independent surveyor, others prepare their own quantities, and the surveyors themselves are not unanimous about their recognition in the contract, or whether they should be employed by the architect or employer. It must also be conceded that many architects who take out their own quantities are not adepts at this kind of work. I do not say this in any tone of disparagement to the architect, whose work is sufficiently varied and onerous as it is, without permitting him to become a specialist in measuring and pricing work. Other reasons not less important may be urged why the architect should leave the labour to a specialist. As your correspondent points out, many public bodies, like the London County Council and School Board, employ special quantity surveyors for their work, and the Government Departments directly engage their own surveyors for this work. In the interests of building owners, no doubt this course is the more desirable one; but the architectural profession will not so readily give up their control. Reasons no doubt can be given why the architect in some special cases may be the proper person to take off the quantities: he knows his own work and intentions better than an independent surveyor can, and there can be less chance of collusion between the contractor and a surveyor. In the North the practice, at least, is found to answer, though I hear occasionally of some queer mistakes, and the introduction of items known as "sporting" lines.

Your correspondents seem to point to a general feeling among surveyors who are specially "quantity" or building surveyors to protect their own interests against those in the profession who have not made this particular vocation a special practice, with the object of leading to a more satisfactory and uniform mode of employment. We cannot be surprised if vagueness, pointed out by one of your correspondents, is one of the results of the system as it at present exists. Everyone knows that more correct and precise the items, closer prices and better tendering are the result.

As a further inducement to some organised action on the part of quantity surveyors, I may refer to the want of method adopted by surveyors in taking out quantities, and the need there is, as suggested in one letter, of a school of quantity measuring, based on some scientific classification of the trades. These are points which may be left to the profession themselves. At the present time we find all kinds of vague and slipshod items, such, for instance, as "No. doors of a certain size as per drawings," or "one stair complete from ground to first floor as per detail drawing," a mode of description which might well baffle the builder who wishes to be conscientious and careful; but for which the less scrupulous tenderer would not hesitate to add a heavy percentage to his price by way of covering any risk. So with other items of work which are numbered but not described, and without any size being specified, instances of which may be found in many bills, even of surveyors, which have been hurriedly prepared for the purpose of obtaining tenders.—I am, &c., G. H. G.

SIR,—I once again venture to take exception to your leader in to-day's issue concerning Quantities.

To quote from the leading work on "Quantity Surveying," "The student should first decide whether he will be an expert architect or an expert surveyor; the average man cannot be both." As we are most of us "average" men, assuming the correctness of the above quotation, would it not be desirable, as a general rule, to divide the duties, leaving the combination of them to those double-barrelled geni who are at present rather few and far between?

Once again I must protest against your reiterated imputation that the quantity surveyor commonly tends to lean, at least a little, to the contractors' side, as it really amounts to a gross injustice on an honourable body of professional men, especially as, leaving honour out of the question, the surveyor, placed between Scylla and Charybdis, is practically obliged to steer a middle course.

With respect to the ascertaining of the amount due, previous to granting certificates, where a surveyor is employed, without actually measuring, billing, valuing, and moneying out the work done, the expert quantity surveyor and the expert architect, as a result of a consultation and a few leading measurements with the priced-out bill of quantities before them, can speedily ascer-

tain whether the contractor's requests for certificates are within the mark.

The architect's duties are synthetical, the surveyor's duties analytical. At least five years' training of hard practical work is necessary to fit the average man for either; in fact, I know of several quantity surveyors' assistants of fifteen years' experience unable to "take-off," though first-class men in the other branches of the work.

As "two heads are better than one," surely my contention that the building owners' interests are best served by the employment of an expert architect and an expert surveyor, in place of a medium combination of the two, is not very far from the mark; it is, at least, a good "inner," if not quite a "bull."—I am, &c.,

ALEXANDER H. KINDER.

23, Finsbury-circus, E.C., May 29.

## LINCOLN'S INN FIELDS.

SIR,—After favourably noticing my book on "Lincoln's Inn-fields" in your issue of the 29th inst., you express your surprise at my "curious stricture" on a recent sensible remark of a contemporary (the *Builder*), a remark you also had made previously—viz., that the south side of New-square ought to be demolished, which demolition you advocate again as "a desirable Metropolitan improvement." As you may suppose that I take a special interest in a locality I have been at some pains to describe, and which I should be sorry to see despoiled of its present attractive features, you will perhaps kindly allow me once more to urge my reasons, and more at length than I thought it necessary to do in the book, against the proposed demolition. The authority with which you speak on architectural matters renders it all the more necessary to show my grounds of dissent.

Who desires it? I again ask. Not the tenants of New-square, nor any others of Lincoln's Inn. Perhaps the clerks occupying offices on the north side of the Law Courts and overlooking the square might be pleased with an extension of their view; but surely you would not recommend that the alteration should be carried out on their behalf? Do the public desire it? What members of the public care one straw about it? The barristers, solicitors, and their clients who go to Carey-street go there on business, and as soon as that is settled hurry away from the spot. The loafers who always haunt courts of law deserve no consideration. For their convenience—and too much attention is already bestowed on that—they have a fine open space on the west side of the Law Courts, and on the north the vast expanse of Lincoln's Inn-fields, usually deserted, showing how foolish was their transfer from private owners to the public. I admit it would be a fine coup d'œil from Carey-street across New-square to the new library and hall of Lincoln's Inn; but as there would be no one to enjoy it, why destroy the amenities of the Inn? And more, the demolition of the south side of New-square would necessitate that of the west side, for to leave the long, narrow strip of houses from the new gateway into Lincoln's Inn-fields down to Carey-street standing between New-square and Serle-street (see map on p. 5) would form as hideous an eyesore as any to be found in London. But, worse than all, you would have to destroy the interesting and picturesque gateway from the square into Carey-street. This, though but 200 years old, forms as characteristic a feature of Lincoln's Inn as the gatehouse facing Chancery-lane. There are vandals voting for that being pulled down! We have had enough of such objectionable improvements; pray let us retain a few cases which remain free from "bike," tramway, and similar nuisances. As New-square now is, it is a comfort to escape into it from the noisy and incessant traffic of Carey-street. As to the cost the suggested alteration would entail, are we not already rated heavily enough to satisfy the fads of the L.C.C., which only put money into the pockets of greedy and tasteless speculators, whilst London is being robbed of all its historic buildings?—I am, &c., C. W. HECKETHORN.

67, South Lambeth-road, S.W., May 31.

At the last meeting of the town council of Chatham it was decided to complete the purchase of the site at the end of the Military-road for the town hall from the War Department. The town hall and municipal offices were ordered to be erected forthwith, and Mr. G. E. Bond, M.S.A., of High-street, Rochester, was instructed to prepare plans and advise the corporation as the probable date of laying the foundation-stone.



## Intercommunication.

### QUESTIONS.

[11508].—**Flats.**—I am thinking of building some mansion flats in London of the usual character, but somewhat more pretentious elevations than usual. Can any correspondent kindly tell me about the cost per cubic foot, including electric light fittings, gas, and all incidentals, until suitable for occupation, except architect's commission?—**INQUIRER.**

## Legal.

### RESTRICTIVE COVENANTS.

WHERE land is laid out for building purposes, and dwelling houses are intended to be erected, it is usual to put restrictive covenants in all the conveyances, so that no shops or places of business shall be built upon the land to the general detriment. This is practically the only way to maintain the residential character which is desired for such an estate, and even this method sometimes fails to be effective. For such a covenant is, of course, of no avail unless it can in the last resort be enforced by an injunction from the Courts. As long as the character of such a locality is reasonably kept up to its original standard, injunctions of this kind for breach of the covenant, can be obtained. But if the character of the neighbourhood has been really and substantially changed by lapse of time, so that these restrictive covenants may be regarded as abandoned, then Courts of Equity will generally refuse to interfere.

In the recent case of "Knight v. Simmons" (*Times*, May 12) this was the point at issue. A large estate at Wimbledon had been laid out for building, and in order to maintain the residential character of the locality a restrictive covenant against the carrying on of any trade or business was put into the conveyances. The defendant knew of this restriction when he bought a plot of land upon the estate, and yet he had since built premises for use as a public laundry, and intended carrying on business there. The plaintiff accordingly brought this action to restrain such a breach of the restrictive covenant. The only defence was that other shops and places of business had been allowed upon the estate, so that its character was so completely changed as to make the covenant no longer enforceable by a Court of Equity. Mr. Justice Romer, however, after hearing evidence as to the few cases in which a business had been carried on so quietly as not to attract the attention of the general residents, held that these trivial breaches did not amount to a general departure from the covenant, and so he granted an injunction, which the Court of Appeal has now, for the same reasons, confirmed, dismissing the appeal with costs.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**Note.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

G. K.—**ARCHITECT.—WORK.**—The work objected to at the time can be done over again. As to the materials passed, there is a difficulty, and it would depend upon what actually happened.

J. S. P.—**LIGHTS.—USER.—FENCE.**—As these windows have not been opened for 20 years, J. has not acquired any right to light through them, and so S. can put up a hoarding or block them up if he wishes by any building upon his own land. Nor does J. seem to have had any right to erect the fence as he did.

Colonel J. T. Marsh, R.E., held an inquiry at the Urban District Council offices, Eastleigh, on Thursday in last week, with reference to an application by the council to the Local Government Board for permission to borrow £2,700, for the purchase of  $\frac{1}{2}$  acres of land for the purpose of a recreation ground. The plans were explained by Mr. Evans, surveyor to the council, who stated that the entire cost of the land would be £4,500.

On Tuesday in last week, at the historic parish church of Ashby-de-la-Zouch, one of the fine churches of the midlands, which has had £15,000 spent on its restoration and enlargement during the last eighteen years, Bishop Mitchinson, Assistant-Bishop of Peterborough, dedicated a new clock and chimes, made by Messrs. Smith, of Derby, at a cost of £200. A festal altar cloth and a second altar cloth, a sanctuary carpet, and other gifts to the parish church of Ashby-de-la-Zouch were also dedicated at the same service.

### LEGAL INTELLIGENCE.

**AN UNLICENSED TOWER.**—At West London Police-court, on Friday, Mr. Rose heard a summons against Mr. David Charteris, a builder, for erecting an iron structure in the grounds of the Earl's Court Exhibition, without first obtaining a license from the London County Council. Mr. Seager Berry, who appeared to support the summons, said the structure was known as the Belvedere Tower, and stood 170ft. high, with a platform 120ft. from the ground, and another at 60ft. These platforms would be reached by means of lifts, and accommodate about 100 people. The Council had some difficulty with regard to these matters, as it had been the custom for builders to apply for licenses at the completion of the buildings in which they were engaged. Mr. Rose thought the Council encouraged that irregularity by licensing the building after its completion. The summons was adjourned for certain alterations, suggested by Captain Simonds, of the Fire Brigade, to be carried out.

**RE W. F. CONEY.**—The debtor was a member of the town council for Southend-on-Sea, and also carried on business there and at 66, Fenchurch-street, as a builder and contractor. On Wednesday he passed his public examination upon accounts showing unsecured debts £251, and debts fully secured £13,300; assets, £100. A composition of 10s. in the pound has been accepted by the creditors.

**LONDON CENTRAL RAILWAY STATION ARBITRATION.**—In the London Sheriffs' Court, on Tuesday, Mr. Burchell and a special jury heard a case in which an Italian restaurant keeper named S. Tenchio made a claim for £2,200 as compensation for the compulsory acquirement by the Central London Railway Company of the claimant's premises, situate at 13, Stanhope-terrace, Bayswater-road, for the purpose of constructing a railway station in connection with their line from the City to Shepherd's Bush. Mr. D. Watney, president of the Surveyors' Institute, on behalf of the railway company, stated that the claim was somewhat exaggerated. Eventually, by consent, a verdict was given for the claimant for £1,150.

**SEWER REPAIR APPEAL.**—**THE QUEEN V. THE VESTRY OF BETHNAL GREEN.**—In the Court of Queen's Bench, on Tuesday, judgment was given by the Lord Chief Justice in an appeal by the Bethnal Green Vestry against a rule obtained on April 27th by the London School Board for a *mandamus* to compel the vestry to repair a sewer constructed in 1866. The Lord Chief Justice, in giving judgment, said the sewer in question received the drainage and sewage of several houses, and was therefore *prima facie* a sewer within the meaning of the Metropolis Management Acts and repairable by the vestry, as was held in "Kershaw v. Taylor." The vestry resisted the application mainly on the ground which they contended was overlooked in "Kershaw v. Taylor"—that previous approval of the construction of the sewer did not appear to have been obtained from the Metropolitan Board of Works, as was required by section 69 of the Metropolis Management Act, 1855, and other portions of that and the amending Acts. After the lapse of 30 years such consent ought, perhaps, to be presumed in the absence of clear disproof; but, even assuming it to be clearly disproved, he thought that the objection must fail. The mere fact that the requisite consent was not obtained for the making of the sewer did not prevent it from being a sewer when made. Further, his lordship thought it ought to be inferred that the vestry knew and approved of the making of the sewer and of its connection with their principal sewer in the adjoining street, and could not now raise the objection. Another ground of less general importance was also taken—namely, that this sewer was within the exception from the general enactment of Section 250 of the Metropolis Management Act, 1855, as having been made "under the order of any vestry." As to this objection it was enough to say that there was no evidence to support it. No such facts were proved, as in "Batman v. Poplar District Board of Works" were held to be equivalent to an express order. The rule for a *mandamus* was therefore made absolute, with costs.

A copy of Rubens' "Descent from the Cross" in Antwerp Cathedral, which until recently stood in the vestry of St. Chad's, Lichfield, has been restored and placed on the north wall in the nave of that church. The picture was formerly the property of the Dean and Chapter, and was the old altar-piece of the cathedral.

A memorial tablet, in memory of Mr. C. W. Lavington, organist at Wells Cathedral, has been placed on the west wall of the south transept, beneath the memorial window to the late Bishop Herve, by the Dean and Chapter. The tablet consists of an outer moulding of alabaster, inlaid work in crimson and gold dividing it from a simple raised moulding surrounding the inner white marble slab, bearing an inscription, surmounted by a St. Andrew's cross in gold.

### WATER SUPPLY AND SANITARY MATTERS.

**ARDSLEY SEWAGE WORKS (NEAR BARNESLEY).**—On Thursday, May 28, the chairman of the Ardsley Urban District Council attended at the newly completed sewage outfall works, and dedicated the same to the benefit of the ratepayers and inhabitants of Ardsley. Mr. Theo. S. McCallum, A.M.Inst.C.E., of Manchester, the engineer of the scheme, presented the chairman with a gold key. The contractors are Messrs. Turton Bros., and Duncan and Jones, both of Stairfoot.

### CHIPS.

The fund for decorating St. Paul's Cathedral has now reached the sum of £26,000.

An appeal is made for £350 to repair the brick tower of the old riverside church at Chelsea, which is in a dilapidated condition.

Extensive banking premises are on the eve of completion at Allahabad for the Bank of Bengal. The contractors are Messrs. Martin and Co., of Calcutta.

On Saturday the foundation-stone was laid with Masonic honours of the Bellshill Academy, the latest addition to the buildings of the Bothwell School Board. The Academy will be a two-story building, to accommodate 1,040 scholars, and will cost £12,000.

The school board for Nottingham have appointed Mr. E. R. Robson, F.S.A., of the Education Department, as assessor in the competition for a Higher Grade School, to be built at the Meadows, in that town.

An inquest was held at Weybread, near Harleston, before the coroner for East Suffolk, on Friday, as to the death of Mr. William Davy Bryant, aged 75 years, master builder, of that village, who, on returning from a drive with George Potter, one of his carpenters, the previous evening, fell dead as he was stepping out of his trap. Medical evidence showed that death resulted from the bursting of a blood-vessel on the brain, and a verdict of accidental death was returned. Deceased was widely known and highly respected in the Waveney Valley district.

Damage to the extent of about £1,500 was caused on Monday night by a fire at the pottery of Henry Kennedy and Sons, M'Arthur-street, Bridgeton, Glasgow. Two sheds, one 120ft. long by 25ft. broad, and the other 70ft. long, with their contents were destroyed, and damage was done to adjoining buildings.

Mr. James S. Gaskell, M.I.C.E., has been appointed resident engineer to the Surrey Commercial Dock Company, in succession to the late Mr. James Adair McConnochie.

The new graving dock at Leith, commenced about two years ago, has just been completed, the cost of the undertaking being about £30,000. The dock, which is 285ft. long and 70ft. broad, will be known as the Alexandra Dock.

A marriage is arranged, and will take place in August, between Charles James, eldest son of Sir Arthur W. Blomfield, A.R.A., and Eleanor, daughter of Mr. William Macandrew, J.P., of Westwood House, Little Horkesley, Essex.

The Indian Institute in the University of Oxford is at length completed in all its parts. The latest benefactors have been the Thakur Sahib of Gondal, who has contributed £4,500, and Sir Sourindro Mohan Tagore, Calcutta, who has presented a magnificent collection of Indian musical instruments and other costly gifts to the museum. On July 1 the ceremony of inaugurating the finished building will be performed by Lord George Hamilton. The library, museum (now much enlarged), and new lecture-rooms will then be thrown open.

Plans are before the Sunderland Corporation Buildings Committee for the erection on the site of Hartley's Glassworks, Millfield, of 205 houses and shops, in the place of an extensive manufactory which has for years been there.

On Tuesday a memorial window in Lichfield Cathedral was unveiled and dedicated by the Bishop of the diocese in memory of the late Canon Curteis, precentor of the cathedral and first principal of the Theological College, and subsequently chaplain of the Savoy.

A meeting of the town hall committee of the Cardiff Corporation was held on Tuesday. The report of the sub-committee appointed to deal with the Temperance town site was read. The sub-committee suggested that Mr. J. E. Gunn be offered 2½ years' purchase for the acquisition of the sum of £826, subject to satisfactory replies being obtained respecting the various other interests. A second suggestion was also made that an expert be appointed at a salary not exceeding 60 guineas for the purpose of valuing the various interests, excluding Mr. Gunn's interest, and that Mr. George Thomas be appointed for the purpose. The report was adopted, an amendment instructing the borough surveyor to "roughly value" the properties being defeated.



## Our Office Table.

In the course of further excavations in the island of Melos by the director and students of the British School at Athens, one of the most important discoveries has been that of a mosaic, believed to be the finest yet found in Greece. It seems originally to have been about 40 metres long, and to have consisted of five panels, three of which are ornamented with geometric patterns, and the other two with figure-subjects, very beautiful both in design and colour. On one of them are represented two vines, with leaves and grapes, among which birds and animals are grouped; the other panel with a circular design, consisting of a series of different fish; while each of the angles holds a tragic mask, very finely treated. The finer details of colour are represented with glass tesserae, while portions of the black are laid in gleaming obsidian, so that the whole has a most brilliant effect. More recently the excavators have come upon a series of graves of the sixth century B.C., in one of which was found a number of ornaments in gold and silver. In another, a Roman tomb, was found a series of gold leaves from a wreath, and a gold ring with a fine subject in cameo. The excavations are now being closed for the season, and Mr. Cecil Smith, the director of the school, is shortly expected in England. The annual meeting of the subscribers to the school will be held about the middle of July, when Mr. John Morley has consented to preside.

The annual general meeting of the Art for Schools Association took place on Wednesday afternoon, at 29, Queen-square, Bloomsbury, Professor Woolridge presiding. Mr. Laurence Benyon, hon. secretary, read the report, which testified to the continued increase in the Association's work. The number of schools and school boards supplied was larger than in any previous year, and the number of pictures sold (3,864) had only once been previously exceeded. Under the new code it had been possible to take parties of children to picture galleries, the Education Department allowing such visits to count as school attendance. The Committee tendered thanks to the lady students of the Royal Academy Schools who had accompanied the parties to give explanations of the pictures. Mr. Wyndham Holgate, Lord Hampton, the Rev. Stewart Headlam, and Mr. Britten were re-elected to the Executive Committee. Among those who took part in the proceedings were Mr. E. P. Warren, Mr. Lionel Cust, C.B., and the Rev. Brooke Lambert.

The annual meeting of the members of the Auctioneers' Institute of the United Kingdom was held at the Institute, 57 and 58, Chancery-lane, on Thursday afternoon in last week. Mr. F. R. Everill, of Worcester, who occupied the chair, in moving the adoption of the report, said the number of applications for membership during the past year was double that of the preceding year, and the number admitted—99—represented an addition of something like 14 per cent. to the roll of members, as against a loss of about 3 per cent. by death, resignation, and other causes. Ten per cent. of the applications were declined after careful inquiry into the professional status and character of the applicants. There had been a corresponding addition to the revenue, which was for the last year upwards of £1,300, as against £946 in the previous year. For the first time in the history of the Institute the council had to record an investment as the first nucleus of a reserve fund for £200. Mr. W. T. Smith, of Rye, seconded the motion, and the report and statement of accounts were adopted. In the evening the tenth annual dinner of the Institute was held at the Holborn Restaurant.

According to M. Deplay, green wood, when cut down, contains about 45 per cent. of its weight in moisture. In the forests of Central Europe wood cut down in winter holds at the end of the following summer more than 40 per cent. of water. Wood kept for several years in a dry place retains from 15 to 20 per cent. of water. Wood which has been thoroughly desiccated will, when exposed to air under ordinary circumstances, absorb 5 per cent. of water in the first three days, and will continue to absorb it until it reaches from 14 to 16 per cent. as a normal standard. The amount fluctuates above and below this standard, according to the state of the atmosphere. M. Violette has found that by exposing green wood to a temperature of 212° Fahr. it lost 45 per cent.

of its weight, which accords with observations of M. Deplay. He further found that by exposing small prisms of wood  $\frac{1}{2}$  in. square and 8 in. long, cut out of billets that had been stored for two years, to the action of superheated steam for two hours, they lost from 15 to 45 per cent. of their weights, according to the temperature of the steam, which varied from 257° Fahr. to 437° Fahr.

THE annual volume issued by Mr. Koch, under the title of "Academy Architecture," has now reached its eighth year, and well maintains its reputation. In all reproductions the results vary, and in very much reduced renderings, such as these, bold and coarsely drawn originals are shown off to advantage, while delicately delineated details naturally suffer, and over-wrought drawings close up and become more or less confused in effect. One of the subjects which gains most in the book before us is Mr. H. Wilson's water-colour view of a scheme for finishing Mr. Sedding's church of St. Augustine at Highgate. Lights have been introduced into the picture not to be found in the original, much to the improvement of the effect. On the other hand, Mr. Carie's views of St. David's Church, Exeter, are heavy and spotty in effect, the half-tones of the original having been intensified by the process. Among the contributors to the volume from among the Academy exhibitors are Messrs. Alfred Waterhouse, R.A., Ernest George and Yeates, James Brooks, Seth-Smith, Gibson and Russell, Maurice B. Adams, John Belcher, Arthur Keen, and Charles Barry, who illustrates the interiors of the Institute of Civil Engineers; G. H. Fellowes Prynn, Ernest Newton, J. Francis Doyle, C. E. Mallowes, H. T. Hare, E. W. Mountford, and J. M. Brydon. From the Royal Scottish Academy at Edinburgh, and the Glasgow Institute of Fine Arts there are a goodly array of drawings followed by some sculptures and carvings of the year, both English and foreign. Mr. Koch himself illustrates his Zürich house for Mr. Koch-Vierboom, and a villa at Berne. Mr. Ignacz Alpar's Millennial Exhibition Buildings at Buda Pest, as here represented from photographs, are among the best works of the kind we have ever seen, and are really remarkable for their excellence.

The 12th annual exhibition of the Home Arts and Industries Association will be held at the Royal Albert Hall on Monday next, the 11th inst., and following days from 2.30 to 7 o'clock. H.R.H. the Princess of Wales and H.R.H. the Duchess of York, who are sending specimens of their work, have graciously promised to visit the exhibition. The exhibits consist of specimens of wood-carving, inlay, embossed leather work, pottery, baskets, bookbinding, handspun linen and woollen fabrics, embroidery, &c., the work of the classes affiliated to the Association.

The tender of Mr. Shillitoe, Bury St. Edmund's, at £24,999, has been accepted by the Metropolitan Asylums Board for the erection of two staff blocks and a laundry, and making alterations and additions to the administrative block and boiler-house block at the Gore Farm Hospital. Messrs. A. and C. Harston, 15, Leadenhall-street, are the architects.

The new oak stalls in the parish church of St. Austell were used for the first time last week. The floor of the chancel has also been beautified by the laying of new steps and tiles. The lowest steps are of dark green Sicilian marble, the second set of red, and the highest of white English marble. The fronts and ends of the stalls are carved. The whole work has been carried out under the direction of Mr. G. H. Fellowes Prynn, of London.

In the New Primitive Methodist church and hall at Parkhead—Mr. Leonidas B. Buik, architect, Glasgow—great care has been taken to make the ventilation effective, the "Climax" Direct-Acting Turret Ventilators, ornamental design C, being used on roof of church, and the "Climax" Continuous Exhaust Ventilators on the hall. These have been supplied by Messrs. Cousland and Mackay, ventilating engineers, Glasgow.

Mr. John Elgar Hayward, builder, of Deal, died at his residence on Saturday, after two days' illness. Councillor Hayward first became a candidate for a seat on the Deal Town Council in November of 1882, and lost his election by one vote only. In the following year he was returned at the top of the poll, and with two years' intermission by his own choice he had held office ever since. His connection with the Congregational Church extended over half a century.

The board of the Sheffield General Infirmary have adopted plans by Mr. J. D. Webster, of St. James's-street, Sheffield, for the erection of new nurses' house and ophthalmic wards.

## MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Edinburgh Architectural Association. Visit to Falkland Palace. Train from Waverley Station 2.10 p.m.

SATURDAY (JUNE 13).—Northern Architectural Association. Annual excursion to Beal, Hazonston Castle, and Holy Island. Train from Central Station, Newcastle, 9.20 a.m.

Incorporated Association of Municipal Engineers and Surveyors. Meeting at Hanley. 11.30 a.m.

## CHIPS.

Alterations are being made to Bethnal Green Church, including the ventilation, which will now be carried out in the Boyle system.

Messrs. J. H. Hickton, of Walsall, and H. E. Farmer, of Wednesbury and Darlaston, architects and surveyors, announce that they have entered into partnership, and will practise in future under the style of "Hickton and Farmer," at the offices now occupied by them at Bridge-street, Walsall (late Mr. Samuel Loxton), Bank Chambers, Wednesbury, and Alban House, Darlaston.

The Technical Education Committee of the Sunderland Corporation have decided upon a site for the proposed institute for instruction in technical matters. It is in Green-terrace, near Bishopwearmouth Church, and its cost will be £3,150.

A large clock with three 8ft. dials, chiming the Cambridge quarters and striking hours, has been erected at the parish church of Stone, Staffordshire, by Messrs. John Smith and Sons, Derby, whose design had been approved by Lord Grimthorpe.

The Bishop of Chester visited Tarporley on Tuesday week, to dedicate the new church of St. Thomas at Eaton. The church is built of brick, with stone facings, and consists of nave, apsidal chancel, and vestry. Mr. John Vernon, of Eaton, was the builder.

A new cottage hospital was opened at Tavistock on Friday, erected out of a legacy of £4,000 left by the late Miss Herring, of Brentor. The Duke of Bedford gave the site. The cost of the building, which contains 16 beds, is £2,400. Mr. Snell, of Plymouth, is the architect, and Mr. Faye, of Horrabridge, the builder.

The Wesleyan Chapel at Sutton-on-Sea was reopened last week after internal improvement. The work was carried out by Messrs. Thompson and Sons, of Louth, under the supervision of Mr. J. Wills, of Derby. In addition to these alterations a pipe organ with six stops has been built and fixed by Messrs. Brinley and Foster, of Sheffield.

At Monday's meeting of the Upper Stour Valley Main Sewerage Board, the engineers, Messrs. E. J. Martin and W. Fiddian, reported that the contract for the sewage of Tividale has just been completed.

The tender of Mr. David Jenkins, builder, has been accepted for restoring a portion of Singleton Abbey, the property of Lady Swansea, which was destroyed by fire on Feb. 4, 1896.

The parish church of Wales, near Kiveton Park Station, is about to be enlarged in accordance with plans and designs by Mr. C. Hodgson Fowler, F.S.A., of Durham.

On the afternoon of Saturday last thirty-four members of the archaeological section of the Midland Institute made the first of their annual excursions—the 101st of the series—to Pershore Abbey, Crothorne, and Fladbury. Mr. Jethro A. Cossins, of Birmingham, acted as guide.

In the case of the application for discharge from bankruptcy of John Thomas Bellamy, of Burton-on-Trent, builder and contractor, the order for discharge has been suspended for two years, ending January 29, 1898.

The members of the Hampshire Field Club held an afternoon meeting at Shawford and Otterbourne on Wednesday.

A memorial to the brothers Portal will be placed in a position in the south transept of Winchester Cathedral, now occupied by the mural tablet to Major-General Sir John Campbell, who fell at the assault on the Redan.

The new buildings of the Falkirk Savings Bank were formally opened on Friday. The bank is Classic in character, and has a frontage to the High-street. It is a two-story building, having on the ground floor the public office, manager's room, and safe; and on the upper floor board-room, committee-room, lavatories, &c. The total cost has been about £1,700. Mr. William Black is the architect.

On Thursday evening in last week a meeting of the Cardiff Museum Committee was held at the town hall to receive the final plans for the new museum buildings to be built in Park-place. These were adopted, and will now be submitted to the buildings committee of the corporation for its approval. The estimated cost of the buildings is £13,500.



## Trade News.

### WAGES MOVEMENTS.

**THE DISPUTE IN THE LONDON BUILDING TRADES.**—It is very satisfactory to be able to report that the strike in the building trades of the Metropolis is practically over, the Central Master Builders' Association having conceded the demands of the various trades concerned for a halfpenny an hour increase, and a modification of the working rules. During last week various building firms successively granted the carpenters' terms, and a settlement having been arrived at on Friday between the Master Builders' Association and the Amalgamated Society of Carpenters and Joiners, some ten thousand workmen in these trades resumed work on Monday. An important feature in the new code is the provision for the constitution of a board of conciliation to deal with all cases of objection raised against the employment of any particular workmen, the decision of the board to be final and binding. The plasterers, who still remained on strike, agreed on Tuesday to a like advance and a new code of rules, and they will resume work on Monday morning next. For the present, however, the labourers remain on strike, and a demonstration in support of their attitude, which was very largely attended, was held, on Sunday, in Trafalgar-square. Various speakers declared that the labourers would abstain from work until their demands for a halfpenny per hour advance were conceded, and this decision was confirmed at a meeting of the men held on Wednesday. The master builders still offer an advance to labourers of a farthing.

**ABERDEEN.**—The settmakers employed at the local granite quarries came out on strike on Monday, in consequence of the masters' refusal to supply and sharpen the tools. The strike affects about 300 men.

**BRADFORD.**—The wages of the joiners in Bradford were increased on Monday last from 7½d. to 8d. per hour.

**EDINBURGH AND LEITH.**—It is expected that within a few days a settlement will be arrived at between the carpenters and joiners who are on strike and the employers. A largely-attended meeting of the Edinburgh and Leith Master Builders' Association was held in Dowell's Rooms on Tuesday. After discussion it was decided, as the meeting considered that the points of difference between the employers and employes were now so slight, to appoint a committee to meet a deputation of the men to discuss the whole matter, so that a satisfactory settlement might, if possible, be arrived at. A deputation of the masters was accordingly appointed, and an intimation sent to the secretary of the operatives. The men readily agreed to the suggestion, and accordingly the two deputations met in the afternoon in Dowell's Rooms. The meeting lasted for nearly two hours, and was private; but both masters and men expressed the belief that very soon the struggle would be over.

**IPSWICH.**—The bricklayers threaten to strike on July 2nd if their demands for an increase of wages and alteration of working rules are not complied with by the master builders.

**KETERING.**—It is proposed that Messrs. J. A. Gotch and Sanders, architects, of Kettering, be asked to arbitrate in the dispute between the master builders and their workmen. The latter went out on strike at the beginning of May for a ½d. an hour advance and an adjustment of working rules. Mr. W. J. Payne has resigned his position as vice-president of the Kettering Master Builders' Association, and has signed the new rules, regarding the demands of the men as reasonable. His employes have, therefore, returned to work under the conditions they asked for.

**KINGSTON-ON-THAMES.**—The Master Builders' Association of Kingston having refused to receive a deputation to discuss the advance to 10d. per hour and new code of working rules. The bricklayers have struck work on all jobs where the union rate is not paid.

**LEEDS.**—The Leeds bricklayers and labourers are still on strike for an advance of ½d. per hour and modifications of the working rules. At a joint meeting of the Master Builders' Association and of the Builders' Exchange Club, held under the presidency of Mr. William Irwin, it was decided that the state of trade does not warrant the grant of an increase, which would make the rate of pay for bricklayers 9d. and their labourers 6½d. per hour.

**NANTWICH.**—On Saturday, at noon, the joiners in Nantwich and the district struck work pending the settlement of a number of alleged grievances and a proposal for an advance of wages. The rate of wages in the past has varied from 5d. to 6d. an hour, and the men now ask for an advance to 7d. per hour.

**NOTTINGHAM.**—After considerable negotiations the threatened strike of the bricklayers engaged in Nottingham has been averted. The representatives

of the masters met on the night of Thursday in last week, and agreed to grant the advance of ½d. per hour asked for by the men, subject to an alteration as to the working rules, and it is understood that the arrangement is satisfactory to both parties.

**PETERBOROUGH.**—The arbitrators, Councillors Joseph Clifton and William D. Nicholas, who were called in to settle the dispute between the builders of Peterborough and the bricklayers, have made their award, recommending an increase in the standard rate of wage from 7d. to 7½d. per hour, to remain in force for three years from June 1, and that a code of working rules be formulated without delay on behalf of both masters and men.

### CHIPS.

A new county police-station is in course of erection at Felixstowe, under the supervision of Mr. H. Miller, of Ipswich, the county surveyor. The contractors are Messrs. T. Parkington and Son, of Ipswich.

A new hotel and theatre is to be built in Perth, Western Australia, on a site immediately facing Government House, and isolated on three sides. The hotel will be four stories in height, and the entire cost is estimated at £100,000. The plans have been prepared by Mr. Walter Emden, of London.

Messrs. Simpson and Harvey, architects and surveyors, Leicester, have been instructed to inspect sites, and report on the question of providing a new cemetery for the parish of Barwell.

Colonel William Ludlow, the Military Secretary to the United States Embassy, who has lately been in the United States, has received orders while there relieving him from duty as Military Attaché and appointing him to an important position as Engineer-in-Charge of the Lighthouses and Fortifications of New York Harbour.

The law courts at Bendigo, Victoria, have been formally opened. They include, besides courts of justice, a post-office and public buildings, and have cost £88,300. Mr. G. Watson was the architect, and the contractors were Mr. R. C. Brown for foundations, and Messrs. McCulloch and MacAlpine for the superstructure.

The second section of the Esplanade at Lynmouth, which has been in course of construction through the winter, was formally opened on Friday. The first portion of the work was completed and opened four years since, and although a second portion has been added, there is yet a proposal to still further increase the walk. The esplanade is 1,100ft. long, 30ft. wide, and contains 5,000 cubic yards of masonry. The wall on the sea front is 1ft. wide at the base and 2ft. 6in. at the top. Mr. G. C. Smyth Richards was the engineer, Messrs. Jones Brothers were the contractors, and Mr. Greenwood was the clerk of works.

The memorial to the late William Vincent Wallace, the composer of "Maritana" and other popular operas, which Mr. Charles May, of Hampstead, has been commissioned to execute, takes the form of a medallion, over life-size, placed on a polished slab of marble. The medallion will be encircled by a laurel wreath springing from underneath, and will be in bronze. On the lower part of the tablet a large scroll will be spread across, naming the composer's principal works and chronicling the dates of his birth and death respectively. The memorial will be ready for unveiling by the beginning of August.

The ceremony of laying the foundation-stone of the new building which is to replace the structure known as Paradise-place Boys' School, Exeter, took place on Friday. The facing materials will be Cattybrook red bricks, with Box stone dressings. The roof will be slated. The accommodation consists of a main schoolroom on the ground floor, 64ft. by 21ft. 6in., capable of being divided by sliding glazed partitions into three classrooms. There are also cloakroom, 21ft. 6in. by 13ft.; lavatory, 12ft. 6in. by 18ft. 6in.; a teachers' and waiting room, 12ft. 9in. by 11ft. 6in., with two entrances. On the upper floor are two classrooms, 42ft. 6in. by 21ft. 6in., museum, and school stationery store. The accommodation provided for in the original plans was for 250 boys, and the amount of the contract is £2,592.

The honorary freedom of the city of Carlisle was conferred, on Tuesday, upon Mr. Alderman Richard S. Ferguson, F.S.A., Chancellor of the Diocese of Carlisle, in recognition of his services as Mayor during the last two years in which he held the office, and in connection with the establishment of the public museum, art gallery, and schools of science and art at Tullie House, Carlisle, and also in acknowledgment of the aid rendered by him to archaeological research in the North of England during the last 25 years. Mr. Ferguson was subsequently presented with his portrait in oil, and painted by Mr. Sephton; this will be placed in Tullie House, and a replica by the artist will be painted for Mr. Ferguson's own house.

On Friday, Mr. R. H. Bicknell, C.E., an inspector from the Local Government Board, held an inquiry at the District Council Office, Cannock, relative to an application by the Urban District Council for sanction to borrow £5,000 for sewerage works. Mr. Peake, surveyor to the district council, explained the plans.

St. Thomas's Church, Radcliffe, was reopened last week after internal decoration, carried out by Mr. Reuben Bennett, of Manchester.

The new branch of the Canada Dock at Liverpool has been opened this week. It has a width of 300ft., and a lineal quayage of 2,400ft. Along the north side there runs a single-story shed, 125ft. in width, and along the south side a double-story shed, 95ft. wide, of fireproof construction, and furnished with a large number of 30cwt. hydraulic roof cranes. The lock leading to the new branch is wider and deeper than any other in Liverpool, being 600ft. long, 100ft. wide, and 14ft. below the bottom of the Old Dock sill, so that with a 10ft. tide there is a depth of at least 34ft. of water. Hence the largest vessels of the port can use this entrance with impunity.

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### TENDERS.

\* \* \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**ANDOVER.**—For nine new cottages, for the Venerable Archdeacon Sutton. Mr. Lacey W. Ridge, London, architect:—

Beale (accepted) ... .. £1,185 0 0  
(Private tender.)

**ANDOVER.**—For new billiard-room at Billesden House, for Mr. Alfred H. Huth:—

Beale (accepted) ... .. £200 0 0  
(Private tender.)

**ANDOVER.**—For new billiard-room at the Star and Garter Hotel, for Mr. Jas. Bridge:—

Beale (accepted) ... .. about £200 0 0  
(Private tender.)

**BOURNEMOUTH.**—For constructing sewers from the Sanatorium to Braidley-roads; in Surrey-road, from Surrey-road South to Wimbome-road; and in the north end of Lansdowne-road to Wimbome-road. Mr. F. W. Lacey, borough engineer and surveyor:—

Books, F. (informal) ... .. £2,154 5 6  
Cooke, B., and Co. ... .. 1,851 0 0  
Saunders, S. ... .. 1,699 0 0  
Saunders, W. H., and Co.\* ... .. 1,660 0 0  
\* Accepted.

**BRIGHTON.**—For re draining Nos. 1, 2, and 3, Clifton-terrace. Mr. C. E. Hewitt, 118, Queen's-road, Brighton, surveyor:—

Harmer, A., Portland-street ... .. £75 17 6  
(Accepted.)

**BRIGHTON.**—For alterations and additions to Nos. 106 and 107, Upper North-street, including new drainage, &c., for Mr. W. Stuckey, 4, Prince's-place. Mr. C. E. Hewitt, 118, Queen's-road, Brighton, architect:—

Nye, T. E. ... .. £298 1 2  
Barnes, J. ... .. 280 0 0  
Polter and Olive ... .. 278 0 0  
Parsons, W. ... .. 269 0 0  
Wilson, F. T. (accepted) ... .. 251 0 0  
(All of Brighton. Architect's estimate, £255.)



**BULLINGTON, HANTS.**—For new conservatory, green-room, &c., at Bullington House, for Mr. Hy. Nicoll:—  
Beale, Andover (accepted) ... about £200 0 0  
(Private tender.)

**CHELMSFORD.**—For a pair of villas. Mr. R. Mawhood  
Chelmsford, architect:—  
Saltmarsh, E. ... £1,051 19 0  
Samms, W. ... 996 0 0  
Johnson, F. (accepted) ... 965 10 0  
Gowers, J. ... 945 0 0  
All of Chelmsford.

**CROYDON.**—For the erection of three houses in Welling-ton-road, Croydon, for Mr. Frank Gothard. Mr. Robert M. Chart, F.S.I., M.S.A., Croydon and Mitcham, archi- tect and surveyor:—  
Waller, D., Jun., ... £1,184 0 0  
Hanscomb and Smith ... 1,100 0 0  
Smith and Sons (accepted) ... 875 0 0  
All of Croydon.

**DARTFORD.**—For the erection of two staff blocks and laundry, and making alterations and additions to the administrative block and the boiler-house block at the Gore Farm Hospital, near Dartford, Kent, for the Metro- politan Asylum Board. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects. Quantities by Mr. W. T. Farthing:—  
Leslie and Co., Ltd. ... £31,825 0 0  
Gregory and Co. ... 29,748 0 0  
Johnson and Co., Ltd. ... 29,450 0 0  
Lawrance, E., and Sons ... 26,920 0 0  
McCormick and Sons ... 26,823 0 0  
Shillitoe, J., Bury St. Edmund's\* ... 24,999 0 0  
\* Accepted.

**DOVER.**—For four shops, and dwellings over, in Worthington-street and Queen's Gardens, for Mr. H. W. Thorpe. Messrs. Worsfold and Hayward, Dover and London, architects. Quantities by Messrs. Dunk and Bousfield, Billiter-square Buildings, E.C.:—

Adcock, W. J. ...	£3,191 0 0
Bromley, W. ...	3,085 0 0
Lewis, W. G. ...	3,077 0 0
Stiff, H. ...	3,075 0 0
Austen and Lewis ...	2,970 0 0
Lewis, G., and Sons ...	2,925 0 0
Denne, W. and T., Walmer ...	2,852 0 0
Hayward and Paramour (accepted) ...	2,847 0 0

Rest of Dover.

**DOVER.**—For building three shops with dwellings in Priory-place, for Mr. H. W. Thorpe. Messrs. Worsfold and Hayward, architects:—

Adcock, W. J. ...	£1,635 0 0
Stiff, H. ...	1,595 0 0
Austen and Lewis ...	1,580 0 0
Lewis, G., and Son ...	1,580 0 0
Bromley, W. ...	1,559 0 0
Hayward and Paramour ...	1,490 0 0
Denne, W. and T. (accepted) ...	1,450 0 0

**DOWNE.**—For the alterations and additions to the Queen's Head, Downe, near Orpington, Kent, for Messrs. Nalder and Collyer's Brewery Co., Ltd., Croydon. Mr. Robert M. Chart, F.S.I., M.S.A., Croydon and Mitcham, architect and surveyor:—

Quittenton, Warlingham ...	£850 0 0
Goulder, Croydon ...	845 0 0
Smith and Sons, Bromley Common ...	747 0 0

**EDMONTON.**—For alterations and additions at No. 180, Upper Fore-street, Edmonton, N., for Messrs. Griffiths and Co. Mr. H. Riches, 3, Crooked-lane, London, E.C., architect:—

Shurmur, W. ...	£405 0 0
Porter, A. ...	396 0 0
Knight, H., and Son ...	390 0 0
Scott, S. J. ...	375 0 0

**GREAT BADDOW, ESSEX.**—For a pair of cottages and stable. Mr. R. Mawhood, Chelmsford, architect:—

Saltmarsh, E., Chelmsford ...	£700 0 0
Samms, W. ...	660 0 0
Rayner, J. ...	635 10 0
Fincham, W., Chelmsford (accepted) ...	634 0 0

**GREAT BADDOW, ESSEX.**—For four cottages. Mr. R. Mawhood, Chelmsford, architect:—  
Eaton and Ely, Chelmsford ... £623 10 0  
(Accepted.)

**HORNCASTLE.**—For alterations to the board-room and nursery wards at the workhouse:—

Hatcliffe, M., Horncastle (accepted) ...	£784 0 0
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**KIDDERMINSTER.**—For the erection of two shelters in Brinton Park, for the town council:—  
Smith, H. (accepted) ... £129 0 0

**LEAMINGTON.**—For additions to the brewery, for Messrs. Lucas, Blackwell, and Arkwright, under the superintendence of Messrs. Scamell and Colyer, 18, Great George-street, Westminster, S.W. Quantities by Messrs. R. L. Curtis and Sons, 119, London Wall:—

Contract No. 1.—Building:—	
Smith, G. F., & Sons, Leamington* ...	£4,499 0 0
Contract No. 2.—Ironwork:—	
Moreland, R., and Sons, London ...	1,828 0 0
Thornewill and Warham, Burton- on-Trent* ...	1,753 0 0
Contract No. 3.—Machinery:—	
Thornewill and Warham, Burton- on-Trent ...	4,584 0 0
Wilson, G. R., & Co., Ltd., Frome* ...	3,657 0 0
Contract No. 4.—Coppers:—	
Wilson, G. R., & Co., Ltd., Frome* ...	882 0 0
Contract No. 5.—Pipes, &c.:—	
Wilson, G. R., & Co., Ltd., Frome* ...	1,837 0 0
Contract No. 6.—Refrigerators:—	
Lawrence and Co., Ltd., London* ...	371 0 0

\* Accepted.

**LINCOLN.**—For new residence, for Mr. C. J. Fox. Messrs. Goddard and Son, architects:—

Horton, S. and R. ...	£2,229 0 0
Pattinson and Sons, Ruskington ...	2,195 0 0
Halkes Bros. ...	2,100 0 0
Marshall and Harrison ...	1,898 10 0
Otter and Co. ...	1,896 0 0
Wright and Son ...	1,873 0 0
Clove, H. S. and W. (accepted) ...	1,873 0 0
Taylor, D., and Son ...	1,830 0 0

**LONDON, N.W.**—For alterations to premises No. 12, Chapel-street, Somers Town, for Mr. R. Johnstone. Mr. Albert E. Fridmore, F.S.I., architect:—

Beer and Gash ...	£206 0 0
Eastwell ...	206 0 0
Mason and Co. ...	158 0 0
Wiltshire ...	156 0 0
London and Co. ...	156 0 0
Bradford, H. (accepted) ...	144 0 0

**LONDON.**—For additions, alterations, &c., to house and stables, No. 1, Devonshire-terrace, Portland-place, W. Mr. George Hornblower, A.R.I.B.A., 20, Fitzroy-street, W., architect:—

Conway, J., Alpha-road ...	£3,400 0 0
Scrivener and Co., Regent's Park ...	3,230 0 0
Lidstone, N., Finsbury Park ...	3,228 0 0
Webber, A. A., Mortimer-street, W. ...	3,200 0 0
Prosser, D., Charlotte-street, W. ...	3,059 0 0
Stevens, T., South Moulton-street ...	2,983 0 0
Head and Co., Baker-street ...	2,980 0 0
Gould and Brand, Camden Town ...	2,795 0 0
Tout, W., Hendon* ...	2,750 0 0
Dinner and coal-lift:—	
Conway, J.* ...	51 10 0

\* Accepted.

**LUTON.**—For the erection of four villas in London-road, for Mr. T. Jones. Mr. W. J. Pearson, Chapside Chambers, architect:—

Attwood ...	£2,131 0 0
Pryer ...	2,125 0 0
Turner ...	2,109 0 0
Dunham ...	2,030 0 0
Saunders ...	2,013 13 8
Kingham ...	1,988 10 0
Smart ...	1,980 0 0
Parkins ...	1,045 10 0
Buckingham ...	1,810 0 0

All of Luton.

**LUTON.**—For the erection of villa residence, Hitchen-road, Luton, for Mr. E. Shepherd. Mr. W. J. Pearson, Chapside Chambers, architect:—

Taylor ...	£705 10 0
Pryer ...	666 0 0
Kingham ...	630 0 0
Saunders (accepted) ...	600 0 0

All of Luton.

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#### ELECTRICAL, MECHANICAL, AND HYDRAULIC ENGINEERS,

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Wynyard Park and Londonderry House, for the Right Hon. the Marquis of Londonderry.

Lansdowne House, for the Right. Hon. the Marquis of Lansdowne.

The Bank of England and Branches. North British and Mercantile Insurance Co.

New Scotland Yard; and Prudential Assurance Co., Holborn Bars.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

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### THE IMPROVEMENT IN ARCHITECTURE.

**P**ROFESSOR AITCHISON (we hope he does not share the late Mr. Freeman's horror at being described by his title) made several suggestive remarks at the A.A. dinner. Even where it is difficult to agree with them, we must acknowledge their usefulness as aids to reflection. Little is now known of that darkest of all dark ages of architecture, the first five-and-thirty years of this century; yet it is startling to be told, as Mr. Aitchison tells us, that most of the architects then practising were contractors also. The traditions that have been handed down—the tales our fathers have told us—hardly bear this out. The combination was commoner than it now is; but it is difficult to believe that it can have been the usual one. If it was, it worked badly. The architect of to-day is often warned, with reason, against letting himself lapse into mere draughtsmanship. He is told to leave his office and live at his buildings; to handle brick and stone and timber more, and paper less. All this the actual builder can hardly help doing; and yet the builder-architect, if such he was, of the pre-Victorian generation was incomparably less clever at construction than the designer-architect of to-day. He seldom ventured beyond camber arches and kingpost trusses; he "cribbed" his cornices from Peter Nicholson, and thought himself a wonderful geometrician if he knew how to draw a broken-backed ellipse with a bit of string and a couple of pins.

The most despondent of us can hardly deny that we have improved on that state of affairs. But we are compelled to differ again with Mr. Aitchison when he claims that the present separation between the professions of architect and builder is a return to the practice of the Middle Ages. Not only in architecture, but in every art, the Mediæval custom was to make the workman a designer, and the designer a workman. He began low down, and rose, if not entirely by ability—for there was a great deal of human nature in men even then—yet not without ability. As he rose, he naturally used his head more and his hands less. At last—so far as one can now discern—he came to control the general design of his buildings, no doubt influencing the style of minor details also, and sometimes, perhaps, executing such of them as he took a fancy to. He became the head man of his particular set of craftsmen, a set who went about from place to place and apparently worked for long periods together. But in England, at any rate—unless in very late times—the architect, master-mason, or whatever else he was called, seems to have been paid on the same principle as, though we may hope more liberally than, the ordinary masons. We do not hear of his setting up as a compound of designer and detective in a solitude of his own, nor of his being called in by monks or clergymen to prevent their abbey and churches from being "scamped." No doubt the old chroniclers sometimes relate that Bishop So-and-so designed such-and-such a cathedral, just as modern chroniclers relate that Lord So-and-so designed a great church—say in Yorkshire—which, as a matter of fact, was "architectured" by Sir Gilbert Scott. But Bishop So-and-so was not really the architect. The fly-on-the-wheel flourished in former times as he flourishes still, and when he happened to be a gilded fly, people,

then as now, used to compliment him on the skill with which he sent the carriage along.

We should say, therefore, that, according to the prevalent system of the Middle Ages, the architect was simply the head builder. And while every builder, from the highest to the lowest, was honestly paid for what he did, this system answered. He was a member of a guild which was intensely proud of its work, and which could visit him with pains and penalties if he did that work badly, and disgraced his "mystery." The guild at large, probably, undertook the detective part of the modern architect's duties, and undertook them with such thorough practical knowledge as the modern architect can seldom attain to. For those within the guilds the struggle for existence was at a *minimum*. They were pretty sure of regular work, and regular payment for it. They were not cutting each other's throats in competition, nor offering to supply the public with labour and materials at less than cost price. Under these conditions it was possible, and even desirable, that the architect and the builder should be one and the same person. But when the builder became a general contractor matters were utterly changed. There was a perpetual risk that his contract would not be a paying one. Then he would be tempted to make it pay by fulfilling it imperfectly. And even if it was a paying one, imagination was always showing him how to make it pay better by leaving this thing out, and thinning that thing down, and using inferior stuff and half-skilled labour. The guilds were gone as practical checks, and the contractor wanted, and still wants, somebody to look after him. That is how the old designer and worker passed away, and the modern designer and detective arose. A man may be a good architect and builder under 14th or 15th century conditions. He cannot well be a good architect and contractor, especially under the conditions of to-day. The founders of the Institute saw this, and cut off his contractorship. He has to be an architect and fifty other things besides, though not a builder, and altogether he is very far indeed from being a lineal descendant of the master masons of the Middle Ages.

Still, he is better than he was, even within living memory. When the BUILDING NEWS was first founded, the architects whose designs were worth publishing might almost be counted on the fingers. "Classic" was at its poorest, and Gothic was almost centred in Scott and Barry and Pugin. Then a host of able churchbuilders arose, who have not quite died out yet. No better work than they did has been done, during this century, in their special line. Street and Burges, Pearson, Brooks, and many more came near to producing a real revival of Early Gothic, as far as churches were concerned. Old details were never copied more faithfully or with more artistic results. They did all that can be done by skilful imitation of the past. If this succeeds anywhere, it is in ecclesiastical art, which naturally loves the old better than the new. But the system is a failure when it tries to satisfy present wants. So it happened that when modern church-building was near its best, and modern street building was near its worst, the Gothic house of those years was a horror, the Gothic shop-front was a terror to the neighbourhood. It had long been proclaimed from the housetops by people who ought to have known better, that civil and domestic architecture, in the Middle Ages, were nothing but church architecture turned to different uses. Most people will believe anything if it is shouted at them long enough and loudly enough, and hundreds of architects believe this. They were told at the same time, that no Gothic was pure unless it spanned every opening with a pointed arch. This, of course, implied that nearly every old hall, or grange, or cottage in England was impure and bad; but even this result did not give them pause.

They calmly set to work to produce halls and cottages that were pure, and street architecture to match them. The test of excellence was the omission of straight heads and lintels in every shape, and singular indeed were the results. To look through the architectural journals of that period is to marvel how such frightful failures can have been deliberately produced by men who had it in them to do much better. It is to learn what may happen when people give up their own judgment, and submit themselves, for better or worse, to plausible theorists.

Goethe somewhere remarks that those who know little about art are always ready to talk about it, while the really capable artist prefers silence. So it happened that the theorists were routed at last by a hardworking architect who has hardly published a line. Mr. Norman Shaw said nothing; but his buildings, when they appeared one after another, spoke eloquently enough. We infer his ideas from his designs. Style, and purity of style—those will-of-the-wisps which led many of his predecessors into such hopeless quagmires—never take him out of his way. He will follow them as far as he is on firm ground, and not a step farther. Art is his object, and he attains it by rule, or without rule, or against rule—just as it may happen; but always in conformity to reason and good sense. He thinks more of expression than of formal beauty, and knows that it can be produced in many different phases of architecture. Perhaps hardly intending it, he has brought the architectural world to think as he does. He has had imitators, as every able man has; but it is not his imitators who have learned most from him. Architects who adopt quite other types, and who cultivate different fields from his, are more and more following his principles with success. His example has encouraged them to use their own eyes—to follow their own star, in spite of all theories. Those are the ways in which the best work of to-day is being done. It is from these that the improvement in modern architecture, so far as it is real, actually springs; and it is to Mr. Norman Shaw, more than to any other individual worker, that our profession owes them. We hope, now architectural design has become a leading subject in the Institute examinations, that those examinations may do much to promote architecture as an art. But this change is so very recent that its effects can hardly show themselves yet. The improvement we see is due to the emancipation of architects from their former slavery to theories, and to the rise amongst them of some original power of thought and invention. It shows itself yet only in one or two buildings out of a hundred. It does not affect, it is not likely to affect, the surveyor, who never distrusts his own competence to act as an architect, though he is quite certain of the architect's incapacity to do the work of a surveyor. It has not reached, it is not likely to reach, the speculative builder who thinks himself independent of surveyors and architects alike. But by degrees it will raise the taste of the general public; and then surveyors' architecture and contractors' architecture will both have to make way for something better.

### VARIED PRACTICE.

**I**T is with art as with authorship. Have not scores of authors told us in pathetic language of the up-hill struggles of men of genius to obtain recognition, even bare subsistence? Do not we read of the wandering son of the "Vicar of Wakefield" having hailed the *antiqua mater* of Grub-street, of his cousin having told him that there were numerous "dull fellows about town" who lived by writing books, and of his essaying a book in which he dressed up three paradoxes with some ingenuity, of which the world said nothing? So it is with the practice of the



architect. Men who have the "divine afflatus" have found themselves outdone by men their inferiors in ability who have made the humbler branches of the profession a means of gaining the higher.

Few pause to inquire how many and varied are the duties of the ordinary practitioner in architecture, and what these duties imply. If we accept Ruskin's classification of mankind that there are four sets of people—those who *see*, who *talk*, who *make*, and who *think*, we ought to find all these four faculties represented amongst modern professional men, and we know from experience that it is so. To one who can *see*, there are a hundred who can talk about the merits, and demerits of designs and buildings; to one who can make or carry-out there are dozens who can speculate and give us ideas only. The talking town official is one who gets on well all round. He is popular with his committee, in "good odour" with the members of the corporation, and generally manages to allay public feeling and irritation on any point or complaint that may arise. He adroitly manages to shift responsibility on someone else's shoulders, to smooth down the most persistent grumbler or councillor; but with all these qualities for avoiding friction, he is wanting in perception and tact. He may say too much at times, or his gifted fluency of speech may sometimes betray him into contradictions of statement, which are very provoking when he wants to make out a strong case. The glib tongue is perilously contradictory. The maxim, "Talkers are no good doers" is found true in the office and practical details of his work; but "talk" goes a long way in the committee or board meeting, and in this sense the adage is not true. At any rate, experience goes to prove that the man who "sees" the best, or who thinks the most accurately, is not generally the one that gets on so well as the talker in a public office. His capabilities lie in another direction—that of the studio or drawing-office. He can arrange plans, design elevations and details; he will more quickly perceive what is necessary in a scheme of drainage or water-supply, and therefore be less likely to fall into error; but he seems unable to maintain his opinion with the same equanimity and dialectical skill as his talking brother. When confronted with a troublesome and litigious client, or questioned in a council-chamber, he loses all his self-confidence, or becomes irritated under a volley of questions about a matter of estimates or disputed accounts. If he explains anything it is generally done in a tone which resents inquiry, and if left to advocate any design or scheme he generally fails to convince. We see in these "diversities of gifts" in public officials, the advantages of a man of quick reply and retort over one who likes to "think the matter over." A man of ready wit and of quick perception "hits while the iron is hot," and is more likely to carry his point by a *coup de main*, a bold or sudden stroke, than by a more careful consideration and study.

Imagine a scheme of sewerage, or a municipal improvement: the man ready with an answer will settle the question in a few words; he carries conviction to the minds of his committee; he is able to give them an approximate cost, to put before them in the readiest and most convincing way the results of the system he has planned; to show what it will effect; to remove from their minds any merit in alternative schemes by emphasising the merits of his own and exaggerating the defects of any rival plan. On the contrary, the more skilled and conscientious official, from an over-anxiety to be exact, and with a desire to take opposite views into consideration, is able only to accomplish by slow steps, and in the teeth of much opposition, the very same project. A fluent talker can do a great deal more than the most careful set of plans before a mixed assembly like a town council. The most elaborate levels and sections will fail to convince men who cannot understand

the difficulties attending a scheme of this kind. The official architect or surveyor finds it an advantage to equip himself with a variety of matters; to be in touch with builders, engineers, and property owner; to know something about the three leading branches of land surveying, valuation, and agency. In acquiring private rights as in purchasing land for public purposes, he has to meet owners and their legal advisers, to be able to discuss points of law of landlord and tenant, easement, and riparian rights. He ought to be a capable valuer, able to advise his committee as to value of land, enfranchisement of copyholds; to discuss terms with land agents, to understand agricultural law, and make the best terms; he must be a practical building surveyor, and be competent to estimate quantities, measure and price work for sewerage, road-making, paving, and the like. All these things leave him little time or opportunity for artistic work. Is it not the same with the general practitioner? It does not help him to pay too much attention to the "Tribys" of the profession, and, like the Svengali of the Association burlesque, he finds it more profitable to be "tainted with the shade of commercial architecture" than to court the new school.

Eagerness to obtain remunerative work may not be favourable to the advancement of professional interests and unity; but the provincial practitioner knows how very little his income depends on strictly architectural work. He may be engaged on a number of buildings and alterations, mainly houses and shops; but the commission on these works is small compared with a good valuation or arbitration case, or even the commission of a bill of quantities for a large building. These are everyday matters of provincial practice. They pay better, the work is less onerous and prolonged than that of the design and superintendence of a building which may take a year or more in progress. Can we be surprised, then, that the provincialist refuses, at the clamorous demand of a London clique of architects, to give up these lucrative branches of his business? He looks upon his profession mainly as a business for making a living, not as an artistic vocation or pursuit. If he sticks to his "quantity-taking," who can blame him? Just when there is little in the way of architecture, he is asked to take out the quantities for a building that will probably run into, say, £15,000, the bare commission on which would pay him better than the usual 5 per cent. on a troublesome job of half that amount. The former may take a few days' labour, whereas the building might have taken three or four months. At another time, a walk over a house to assess repairs pays better than attending a church-building committee for an edifice that may be years before it brings him in a penny. No doubt this is all very disheartening to the architect who adheres to the high-art view, but we have to acknowledge it, nevertheless, as one of the results of making architecture a professional occupation for thousands of men when there is really work enough only to make a living for one or small fraction of them. And is not this desire to widen and extend their professional vocation a plain indication that there are many more in its ranks who feel that they are more likely to succeed as surveyors than as architects? So long as surveyors can practise as architects, and the latter in a kind of self-defence undertake all kinds of business transactions which are more properly those of the surveyor or general agent, we must be content to abide by results, and to put up with the anomaly of seeing a man at one moment of the day taking measurements and valuing labour materials, and at another engaged in designing a piece of decoration; of sketching a design for a building one day, and the next making a valuation for mortgage. As a

matter of fact, it is impossible for more than a small number of those who join the profession to be architects in more than name, and it would be difficult, if not impossible, to require them to be loyal to the art. As long as our professional societies persist in enrolling men as architects who are mainly surveyors, it is absurd to expect any redress on this ground.

Except to the very few who make architecture pure and simple lucrative, who can afford to leave to others uncongenial work, the general practitioner has chances of emolument denied to the art architect. Does he not get appointed as an arbitrator in a large building case or referee to decide an important party-wall or contract dispute, and is he not considered a better man to undertake the duty of an "assessor" in a competition, than one who has won many competitions himself? The fact is, the man who is the best planner or the most able artist, is not, alas! as we know by experience, the appointed assessor. It is true he is not always the wisest judge, and is wanting in qualities necessary for the judicial mind. The well-to-do practitioner, who has been employed as arbitrator, and is skilled as a building surveyor as well as architect, has a better chance. No; the "all-round" multiple-headed man has somehow greater chances of winning the prizes of life. He is more practical and less emotional, and one kind of work leads to another. And there are diversities of gifts in the same individual. It is a relief even to some men to turn to a bill of quantities after work on a plan or an elevation. Some of our leading artists have taken to mechanical and mathematical pursuits. Da Vinci, Bramante, Michel Angelo, and Wren were skilled as mechanicians or mathematicians, and these different tastes have been pursued without any disadvantage to their vocation—rather, we may add, helping their possessors with resources.

#### DUDLEY GALLERY ART SOCIETY.

THE Summer Exhibition of water-colour studies and sketches at this gallery is not equal to some of its predecessors. There are many drawings from amateur hands; some crude and feeble that would have been better kept in portfolios as samples of an experimental stage. Still there are evidences of promise, and a few of the best works are from lady exhibitors, who are numerous contributors, amongst them being Miss Mary A. Sloane, whose "Evening Meal" is full of delightful sentiment and colour. One of her best works, "Study of a Head" (84), is a side study of a girl's head against a dark folial background. The girl carries a bundle of ivy over her shoulder. The drawing and colour are alike admirable, and there is, moreover, a poetic charm in the handling, which is full of vigour and life. The same lady artist's study of geraniums in a greenhouse (50) is a fine perspective of blossom rich in colour. Miss Helen O'Hara sends a few studies of nature, showing careful work and a true sense of colour. "Preparing for Sport" (2), a small woodland study, with the cool shade of trees and sunlight beyond; and her softly-rendered coast view with rocks, "Giant's Causeway" (63), and "Squally Weather" (284), a clever study of waves in grey, are promising. Miss Nora Davison's drawings are picturesque. "King's Bench Walk in Spring" (34) is a sketch of a block of red brick houses with its screen of foliage, and her sketches of "The Tower Bridge" (243) are well worthy of attention. Miss Margaret Bernard has several subjects. Her view from Cole Hill, Wimborne, is a fresh and strong landscape, broad and sketchy, and the "Market, Brittany" (151), is a delightful luminous sketch of market-place with its group of people; also a pleasing sketch is "Old Houses, Pontaven, Brittany." Another lady artist who has done excellent work is Miss Evangeline Jex-Blake, whose "Castle Farm, Somerset" (191), and her sketches from Brittany at the end of the gallery (202, 199) are charming transcripts of impressions of nature in simple washes of colour. Miss Blake has a knack of expressing in few touches her meaning and of



blending her tints, as in the pollards along the stream of meadow; then we have Mrs. Mary Stevens's delightful studies of wild hillside flowers—"In the Valtellina" (101), "Summer Time in the Engadine" (296), and "An Alpine Slope" (315)—all charming studies of Southern climes. Her large and very clever scene of a verdure-clad valley, with its carpeting of wild flowers in every conceivable hue, is a remarkable piece of brilliant painting; the peaks of distant hills and the perspective making up a splendid landscape effect. The president's daughter, Miss Nigel Severn, furnishes two studies from Brittany in a sketchy, incisive style, and Miss Christian Severn sketches from Wells and Biarritz. The president, Mr. Walter Severn, contributes no less than seven drawings of Biarritz. His principal views are from that locality. "Villa Belza" (8) is a large tranquil scene in that favoured French resort. Less hard is the president's "Rocks and Waves, Biarritz." Here a wide stretch of rippled sea is broken by three curiously-shaped masses of rock, against which waves are breaking; beyond is a line of hills. Of the other views, No. 257 is the most successful, in which the reflection of sunlight on the rippled surface of sea is cleverly painted. B. J. M. Donne is a brilliant delineator of alpine and coast scenery, "A Tranquil Day, under the Chalk Cliffs, S. Devon" (5) is a glimpse of the blue sea, as seen from a precipice in the white chalk rock with its flock of cormorants; the atmospheric effect in "Monte Rosa" (18) is a strongly-painted subject after his usual manner, in which body colour is used with skill and technical power. R. A. K. Marshall has a view at Hurstmonceaux, Sussex (17), and other landscapes; these are laboured in execution, the foliage is careful and finished, but wanting in breadth, as in his "Road to Hailsham, Sussex," a quality of workmanship which scarcely does justice to the labour. Maud Peel's Italian views of Bordighera and her charming sketch of a fountain on the screen (324) are full of delicacy of tone and subtle touch. One of the best seascapes is David Green's, "A Suffolk Harbour" (64), a broadly handled sea in greyish tones, breezy and fresh, with a fishing-boat going out. His other sketches, "A Bit of Old Whitby" (156) and the market, are broad and healthy in colour. A bold headland beach and rocky foreground is "Bracken Bay, Ayrshire," by R. Wane (67), who has very conscientiously depicted this north-western coast and other Scotch scenery. Albert Stevens's views near Lake Como (70, 77), and his Italian view of "Sunset on the Valtellina," equal past performances; brilliance of tone, sunlight, lake, and hilly distance are admirably rendered. Miss Mary Stevens's view in the same district is very pleasing and realistic in its meadow of poppies and daisies. J. Carlisle's "Hampstead," with its may-blossoms and undergrowth, and the blue distance (96), is a study of much beauty. Several finished landscapes come from George Marks; his "Last Blush of Departing Day" (102) is a strong sunset effect. "On Shore Heath" (340) and "A Surrey Heath" (366) are charmingly-finished landscapes, in which the gorse and blue distance are very delicately handled. Other subjects, like "Gorse and May," show Mr. Marks's skill as a delineator of commons and heaths, and their indigenous foliage and flowering shrubs. Hubert Medlycott has a clever sketch of "Battersea Mill" (116); Howard G. Stormont gives us an effective piece of Surrey woodland (117), with its fir-clad hillsides; and Fred J. Aldridge a seascape and brigantine entering port (120). We must also note the broad and vigorous work done by Fred Burgess, who sends several sketches and studies of landscape. "Wimbledon Common" (205), "Near Christchurch" (290), and one or two other sketches, are all characterised by breadth and good colour. J. Twigg sends a nice study of Surrey woodland, the dark foliage of a pine-wood with clumps of rhododendrons, the blossom of which makes a rich contrast. Miss Rose Barton's single subject is "Waiting to be Called For" (264), one of the few figure studies. It represents a lady, attired in ball-dress and cloak, waiting on a balcony of a mansion in Piccadilly in evening twilight, perhaps less successful as a subject than some of Miss Barton's better-known London street views. Nor must we omit to mention Henry Terry's well-drawn figure of "A Lady Waiting" (259), and L. Block's wonderfully-clever pieces of still-life realism, as the groups of old books, calf and gilt bound, with engraved frontispiece (93 and 262, in which, with a

fidelity worthy of photography itself, the artist gives us, with painstaking minuteness, even the gilt-lettering and the tool-marks of bindings and engravings.

## THE TIMBERS OF AUSTRALASIA.—VIII.

THE HARDWOODS: V.—WESTERN AUSTRALIA.

NEXT to New South Wales, the most important of the Australasian colonies, in point of hardwood wealth, is Western Australia. But little good timber of any size is met with nearer the coast than five to seven miles, and the best jarrah grows on the somewhat humid and relatively temperate hilly ranges at least a dozen miles further inland. The principal hardwoods belonging specially to this colony are:—

Jarrah (*E. marginata*);  
Karri (*E. diversicolor*). Not to be confounded with the New Zealand Kauri pine.  
White gum (*E. redunca*);  
Tuart (*E. gomphoccephala*);  
Red gum (*E. calophylla*). Not to be confounded with the River Murray red gum, *E. rostrata*, of Victoria and New South Wales.  
Yate-tree (*E. cornuta*);  
York gum (*E. loxophleba*).

To which may be added the River Murray red gum, the stringy-barks, and the box-trees, most of which are found in Western Australia, but which I have already described in dealing with the sister colonies; and, further, the wealth of the fragrant sandalwood, *Santalum cygnorum*, may be incidentally mentioned, though that timber scarcely comes within the scope of these articles.

By far the most important of the West Australian, and one of the most valuable of all the hardwoods is, of course, the famous Jarrah (*E. marginata*), which has attained a world-wide celebrity. It closely resembles the forest mahogany (*E. resinifera*) of New South Wales, which (as already mentioned) is often sold for it, and, indeed, jarrah is sometimes even known as "West Australian mahogany." There are many frauds practised in the timber trade of Australasia by unscrupulous persons, far more serious and reprehensible than this, for (as I have previously pointed out) the *E. resinifera* is really a most valuable timber. At the same time, it does not possess certain specific qualities of the jarrah-wood, and those, therefore, who desire to specially employ this timber should take the best means of getting it, by dealing only with timber-merchants or shippers of undoubted probity and unquestionable reputation.

The jarrah is a large tree, growing occasionally to a height of 80ft. up to the first branch, and with a stem circumference of 32ft. at 5ft. from the ground. It covers 14,000 square miles of country. The timber from the hill districts (particularly that of the ironstone ranges) is of a darker colour, harder, tougher, and heavier than that from the plains, weighing, when well seasoned, about 64lb. per cubic foot. At the same time, it is easier to work than several of the other Eucalypts of the great western colony, notwithstanding its close, interlocked grain, and its great strength, both transverse and tensile. It is one of the least inflammable of woods, and is, therefore, specially suitable for house-building purposes and the heavier class of furniture and fittings, for which it is largely employed. But it possesses a still greater value in the fact that, when selected from the hilly districts, felled at the season when the sap is least active, and subsequently dried and seasoned with proper care, it is the most impervious timber known to the borings of the *teredo*, *chelura*, and *termities*.

Jarrah is in extensive demand for piles, especially in Western Australia, where it is exclusively used for that purpose; and it is largely regarded also as one of the best and most durable timbers for the frames and planking of ships; while for the general structure of jetties, for railway sleepers, and all kinds of underground structures its value is amply attested by its extensive employment, not only in the chief country of its growth, but by the nearest neighbouring colonies of South Australia and Victoria. Obtainable through at least five degrees of latitude, and within a short or moderate distance of the shipping ports, and waited on, as one may say, by seven private timber railways belonging to the different timber companies, and having a total mileage of at least 120 miles ready to transport it to the coast—the most important of these railways is the forty-mile line of the

Rockingham Railway and Jarrahdale Timber Company, Limited, which passes through the heart of the Jarrahdale Forest to Rockingham Pier, on the western coast, 25 miles south of the capital, Perth—this splendid and invaluable hardwood is more accessible to foreign traffic than even most of the timbers of New South Wales under present conditions. And, in the words, therefore, of Baron von Müller, "this much can be foreseen—that *E. marginata* is destined to supply one of the most lasting of hardwood timbers for a long time to come, at the least costly rate, to very many parts of the globe."

Next to jarrah, the best known of the West Australian hardwoods is Karri (*E. diversicolor*), though its distribution is very much smaller, extending over only about 2,300 square miles of territory, and occurring in the humid country about the south-western coastal rivers east of Cape Leuwin. The Karri is a gigantic tree, which has only one rival in size in the Australasian colonies, the colossal mountain ash (*E. amygdalina*) of Victoria, the grand features of which it almost completely repeats. Its maximum height can scarcely be overrated at 400ft., as stems have been measured 300ft. long up to the first limb, and a circumference of 60ft. at the base is on record. From these enormous trunks widths of timber as great as 12ft. can be obtained; but the young trees, when growing closely together, have a very slender stem, so much so that a tree 180ft. high, and with comparatively but little foliage, may have a stem not over a foot in diameter. This particular characteristic, which, in conjunction with the smooth and whitish bark of the mast-like stems, impresses a peculiar character upon the karri forests, should make the timber specially suitable for flagstaffs and ships' masts and yards, the more so as it is not only durable, but elastic, though not so easily worked as jarrah. Hitherto it has not been employed as largely as its merits would seem to warrant, though it has proved valuable for rails and shafts, the spokes and felloes of wheels, and for other purposes where strength and toughness, combined with elasticity, are needed. The tree, which is easily manageable in culture, and of comparatively quick growth, was introduced some years ago into not only Victoria, but the South of Europe, Northern Africa, and other extra-Australian countries, where it is frequently called *E. colossa*, on account of its colossal size. Its proper and specific name, however, according to the contemporaneous opinion, I believe, of all Australian experts, is *E. diversicolor*, which appellation it derived from the unusual paleness of the leaves on the under side.

The White Gum of Western Australia (*E. redunca*), called by the aborigines "Wandoo," is the most important timber, in point of distribution, after jarrah, the forests occupying at least 10,000 square miles. It is found generally in all the forests excepting those where karri abounds; but it grows in the greatest profusion on the eastern slopes of the Darling Range. It is not a particularly tall tree, seldom exceeding 120ft. in height, though the stem is often very thick, and has been known to attain a diameter of 17ft. It is one of the heaviest timbers in existence, weighing (in well-seasoned stuff) at least 70lb. per cubic foot, and sometimes more. The wood, which is pale in colour, is proportionately hard, tough, and durable, and is largely used in the colony, especially for cart-shafts, cogs, rollers, and the naves, spokes, and felloes of wheels, for all of which it is pre-eminently adapted. It should have, I think, a very much wider application in foreign use, and I have heard no reason alleged why it should not stand in much the same timber category as the ironbarks of New South Wales. Up to the present time, however, the white gum of the great western forests does not appear to have figured to any material extent as an article of export.

Tuart (*E. gomphoccephala*) is a very valuable timber on account of its exceeding strength, as it is considered one of the very strongest timbers known. The area of its distribution is limited, as it grows only on the limestone ranges one or two miles from the coast of the Indian Ocean, and its limits are the Murray River—the Murray which empties itself into Peel Inlet, and not, of course, its far larger namesake of the south-eastern colonies—on the north, and Geopraphe Bay on the south, an extent of only about one degree of latitude. It is a particularly hard timber, twisted and curled in the grain; it shrinks very little in seasoning,



and will not split during the process, and it has been known to be exposed for thirty years without being affected. Tuart is consequently much esteemed for shipbuilding, the coaming of hatches, engine-bearers, the framing of railway carriages, carriage wheels, &c. Large-size planks and scantlings from 20ft. to 40ft. long and 2ft. wide can be cut from this timber.

The West Australian Red Gum (*E. Callophylla*), is really a species of ironbark, growing between Irwin Bay and King George's Sound on the south-east coast, and attaining a height scarcely inferior to jarrah, with an occasional stem diameter of 10ft. Its consumption appears to be chiefly local, and principally at the hands of builders and wheelwrights, who respectively employ it for rafters and other constructional purposes, for naves and spokes, and likewise for agricultural implements. There seems, however, no reason why it should not form an article of export, especially as its habitat is so near to Albany, the West Australian port of call of all the great ocean liners.

Yate-tree (*E. cornuta*) is another valuable timber, growing between Cape Riche and Geopraphe Bay, and is considered for some purposes equal to the best English ash. Its excessive hardness and great elasticity render it peculiarly useful for the shafts of carts and similar articles, as also for agricultural implements and wheelwrights' work. But it is also of value to the shipbuilder, or rather, perhaps, the boatbuilder, as it is particularly adapted for the ribs of boats. Moreover, according to Mr. Walter Gill, F.L.S., Conservator of Forests in South Australia (into which colony the yate-tree has been introduced during the last ten or a dozen years with marked success), this timber possesses a special value, peculiar to itself, in the fact that it is fit for many purposes at an earlier age than most of the other hardwoods. A fence at Bundaleer (S.A.) was lifted some time ago, in which the sap-wood of the round posts, cut from trees only seven years old, showed no signs of decay, though they had been standing in the ground three years. "Few posts of other saplings at such an age," says Mr. Gill, "will stand in the ground above one year. The timber, also, even when cut to a thin strip, proves very tough and elastic; and, used as single bars in a plough, it stands the daily strain of a six-horse team without a sign of fracture."

York Gum (*E. loxophleba*) is found in much the same district as the white gum. In height it seldom exceeds 80ft., and the area of its distribution is in extent about the same as, or slightly larger than, that of the Karri—viz., 2,400 square miles. It is non-fissile, but remarkable for its toughness, and consequently of special value to wheelwrights.

There are some other species of *Eucalyptus* belonging to this colony which may be mentioned. The West Australian Blue Gum (*E. megacarpa*) prevails between Cape Leuwin and King George's Sound, and is understood to be a valuable timber, though at present it is seldom used. Gimlet-wood (*E. salubris*), the most important in the colony of several species for the distillation of the essential oil out of *Eucalyptus*, is a remarkably tough timber, though workable with comparative ease, and not only serves for poles, shafts, &c., of vehicles, but is likewise well adapted for the purposes of the wood-engraver. Both this timber and the Morrell-tree (*E. longicornis*) are found about the sources and upper regions of the Swan River, the latter being extremely dark in colour and particularly hard, and employed locally for rafters in house-building, and for all kinds of wheelwright's work and agricultural implements. And there is still a bastard Box (*E. Microtheca*) scattered northward from the Murchison River to Cambridge Gulf, which is spoken of by local experts as producing a dark, hard, heavy, elastic timber, well adapted for railway posts and sleepers, waterworks, and a multitude of lesser building and ordinary carpentry purposes.

The *Melaleuca leucadendron*, already mentioned under the head of Queensland as White Tea-tree, is now extremely common in the swamps. It is generally known in this country as paper-bark tree. It may be interesting to note a peculiar employment which it now finds—viz., the use of the bark for packing fresh and perishable articles of food.

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Messrs. Ridges and North, architects and surveyors, have arranged partnership, and have opened offices at 24B, Warwick-street, Worthing.

## CONCERT-HALLS AND ASSEMBLY-ROOMS.—XIX.

By ERNEST A. E. WOODROW, A.R.I.B.A.

IN the last four chapters I have given examples of some of the most famous concert-halls of England and the Continent which are used for orchestral and concert music only, and I have endeavoured to show how, under various circumstances, different forms have been adopted at

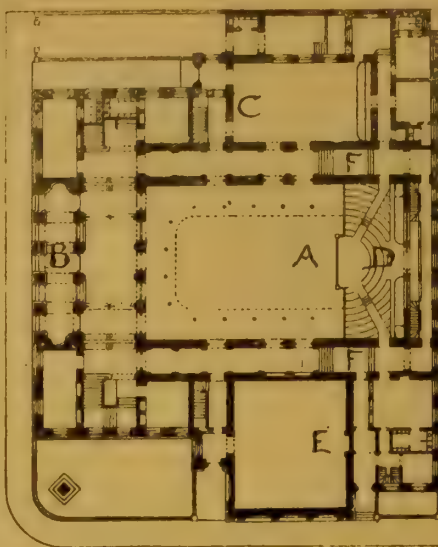


FIG. 1.—A, hall; B, entrances; C, minor hall; D, orchestra; E, library; F, corridor.

home and abroad with a varied degree of success. It is interesting to notice how these forms and proportions vary in almost every individual case. The plans which have been used to illustrate the foregoing chapters differ to a degree one can scarcely credit when one considers the laws of acoustics which are said to govern buildings in which music is performed. The acoustical properties we learn from our textbooks are regulated by the proportions and shape of the auditorium, and the materials of which it is constructed, as well as the condition of the atmosphere. Proportions, materials, and ventilation must therefore be considered by the architect in designing a successful concert-hall. It is impossible to put down hard-and-fast rules to be

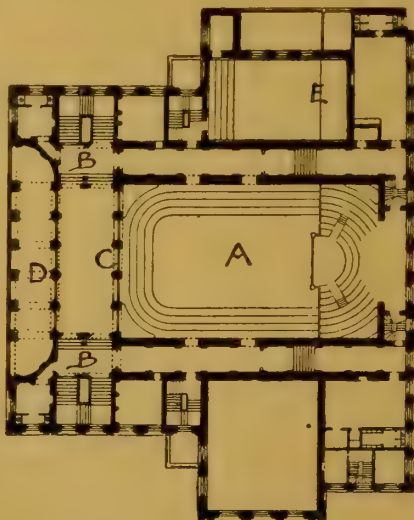


FIG. 2.—A, gallery level of hall; B, staircases; C, foyer; D, loggia; E, upper part of minor hall.

observed under these three heads; and, in fact, every case must be treated on its merits. Mr. Burrows, in his paper on "Sound in its Relation to Buildings," read before the Royal Institute of British Architects, drew attention to the various forms which the plan of a building should assume to insure acoustical success, and he dwelt upon the fact that the greatest difference of opinion existed among authorities on this important

question. First we have the rectangular room, then the circular, the polygonal, the octagonal, the amphitheatrical, the room with curved end and straight sides, followed by the horseshoe type, and, lastly, by the composite type.

We have seen many examples of the rectangular plan in the illustration of the former numbers of these articles. Fig. 1 and 2 represent the Clark Hall at Paisley, which is a plan of this class, and a noted success. Fig. 3, the Cincinnati Music Hall, built by A. F. Oakey, is a building planned as an elongated rectangle, and one of the most celebrated concert halls of America.

Referring to buildings of the composite type, Mr. Burrows spoke of the Grand Theatre, Islington, which was built by Mr. Matcham, and is a house of the provincial class of theatres, where the play can be seen and heard from every part of the house. I produce in Fig. 4 a plan of the ground-floor level of this house, and in Fig. 5 a plan of the dress-circle level. Although built as a theatre, this auditorium cannot strictly be said to come under the class of concert halls and assembly rooms; but it is an example of a successful building for acoustic purposes, wherein operas as well as plays are performed.

Mr. A. F. Oakey, in his admirable paper on "Acoustics of Architecture," which appeared in a number of *Van Nostrand's Magazine* in 1881, says that the acoustics of buildings is a science with which intention has nothing to do: each problem must be studied by itself, and every possible contingency must be weighed and settled by some application of the few simple laws we have to depend on. There are many apartments that are agreeable to

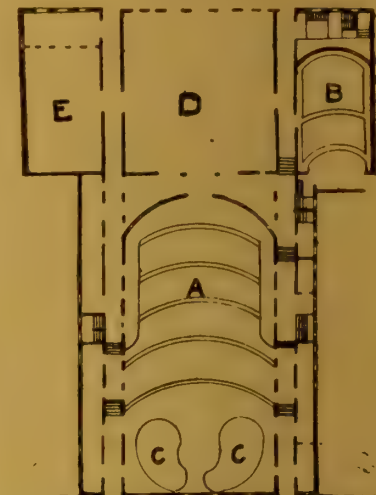


FIG. 3.—A, auditorium; B, minor hall; C, orchestra; D, approaches; E, adjuncts.

a speaker and to his audience, while to a musician and his audience they are more or less annoying, and this is easily understood, because the vibrations produced by speaking are not of so prolonged or regular a nature, and consequently cannot cause nearly so much reverberation. But, on the other hand, there is no instance of an apartment where music is heard to advantage, where a speaker does not find himself free from restraint, oppression, or a necessity for exhaustive exertion.

Proportion, of course, governs entirely the success of a hall, and from the above remarks of Mr. Oakey, one must take into consideration the use to which the hall has to be put. In another portion of his paper he speaks of the distance the average speaker can be heard as 90ft. in front of him in the direction in which he speaks, 75ft. at the side, 30ft. behind, and 45ft. in a vertical direction. Taking any three of these figures, we have 90, 30, 45, or 6, 2, 3; 90, 75, 45, or 6, 5, 3; 30, 75, 45, or 2, 5, 3, or always harmonic proportions. These proportions must exist in the first movement or first disturbance of the air, or these distances as given would be incorrect; and if these proportions are true for the first movement, they must be so for every particle of air that passes the sonorous tremor. Supposing, continues the writer, as is often the case, that the speaker faces in the shortest direction; then the resistance in that direction is much less than laterally and vertically, while the force in that direction is greater; consequently, before those persons seated near the side walls have heard anything, those seated between the speaker and



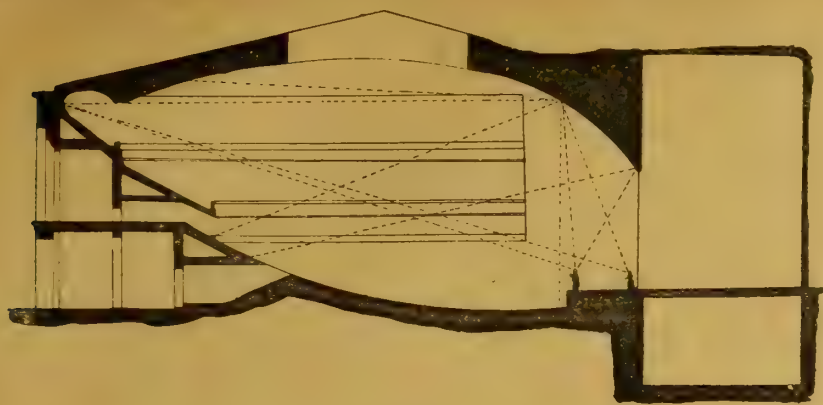


Fig. 6.

the wall opposite have not only heard, but have received an echo from the wall behind them. If we suppose this defective disposition to be changed for a hall of harmonic proportions, in which the speaker delivers his voice, as he should, in the length, we will be much better off, inasmuch as the sounds will be appreciated at all points with the same intensity; but we still have to deal more or less with that opposite wall and its echoes.

Not only the proportions of the plan must be considered, but the proportions of the section. Fig. 6, which is taken from Mr. Gosset's work on planning theatres, gives a diagram of a speaker on the stage, and the dotted lines show the direction of the voice. In this section it will be seen that the line of the area floor, and the lines of the galleries above, are all set out on the Scott Russell isocoustic curve, so that the sound-wave passes to the back, without interruption from the bodies or clothing of those seated in the front rows. Mr. Oakey says there are many difficulties which beset us, including the absorbing surface—an audience present with their clothing. It is not because you are at a greater distance, in your back seat, from what is going on, that you cannot hear well: it is because there is a quantity of material in dresses, coats, bonnets, &c., between you and the performance, and because the sound is rising with the exhalations of all these people, until it passes far above your head, as you sit on a dead level with your nostrils presented to the entertainment in the vain attempt to see, if you cannot hear. There is no disadvantage to a listener in being at the farthest end of an apartment, if only he has nothing but the air, and pure air, between his ears and what he listens to. Mr. Oakey says between his ears, because that average height must determine the difference between the level of his seat and that of his

have already referred as an example of a successful acoustic building, is proportioned on the figures 5, 3, 2, the dimensions being 130ft. long, by 78ft. wide, and 52ft. high. The area floor rises from the platform to the back wall, which is a flat curve. In America, the Boston Music Hall is said to be a good example of Mr. George Snell's work in that city; this hall is worked out on harmonic proportions. The dimensions for the

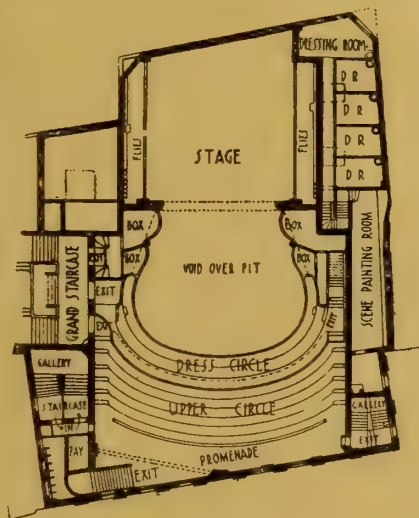


Fig. 5.

Cincinnati Music Hall are based upon the figures 5, 3, 2, being 200ft. long, 120ft. wide, and 80ft. long (see Fig. 3).

Many of my notes on this subject, which appeared in the fifth article on "Theatres" in the BUILDING NEWS of August 19, 1892, are, of course, applicable to the subject now under discussion, although written in special connection with theatre buildings, and I do not propose to traverse the ground a second time. In that article appeared a composite plan of Wagner Theatre at Bayreuth, as well as a semicircular project by Messrs. Davioud and Bourdais, the section of which, however, is reproduced in this chapter, being necessary to explain some of the text.

With regard to the materials used to insure acoustical success at one time, all authorities agreed that wood was the only article to be relied upon; but of late years authorities have differed even on this point. We are all aware of the success Messrs. Perry and Reed attained when they erected the first fireproof music-hall in London. This example has been copied in many instances, and perhaps the greatest success of all is the Queen's Hall, Langham-place.

Concrete has been found to have a great amount of resonance, doubtless on account of the interstices in its formation. Mr. Perry's instance of a concrete house built by him on the coast, where the sound of a gale blowing would, as he expressed it, make the house hum, is an example of the resonance of concrete. Hard plaster surfaces are not consistent with perfection in acoustics. I have already mentioned the method used by Mr. Knightley for lining the walls at the Queen's Hall, Langham-place, as being highly satisfactory.

The form of the ceiling is also a matter of much

importance, to which architects should give great attention. Mr. Statham claims that a flat, or nearly flat, ceiling is the best form for a music-hall; others, as Mr. Burrows points out, insist on a curved form for a ceiling, while others again are content with an ordinary flat curve or concave, which has proved a success at Cincinnati Music-hall (Fig. 3).

Ventilation enters largely into the question of the perfection of a concert-room, the air should be kept pure, and the direction of the ventilation should be from the performer to the audience. A dense or foul atmosphere is fatal to success.

## NOTES ON DOMESTIC DRAINAGE. —XVIII.

EXAMINING AND TESTING OLD DRAINS AND SANITARY APPLIANCES.

WHILST it is essential that every drain and sanitary fitment in all its details shall be properly designed and constructed in accordance with the recognised principles of sanitary science, so that the whole may be absolutely efficient when first constructed, yet in the interests of health it is also desirable that they should be periodically examined and tested—say, once a year—by a thoroughly qualified sanitary expert. Unfortunately, even in the houses of the wealthy, the instances in which such a rule is adopted and properly carried out are comparatively rare, the more usual practice being to defer such examination until it is unmistakably realised that some hitherto unnoticed defect has been the cause of serious illness or disease, and which, had it been discovered in time, might have been easily remedied. It must be borne in mind that, under the most favourable circumstances, drains and sanitary fittings are subject to the deteriorating influence of ordinary wear and tear, and also to inevitable, if slow, decay. On these grounds alone it is necessary that they should be periodically examined and repaired if required. In addition, the drains are constantly liable to be rendered inefficient at some point through accidental or unforeseen causes, such as a settlement of the ground or building, whilst the fitments are often damaged or rendered insanitary through improper or careless use. By a careful examination from time to time any defects arising from such causes are ascertained, and may then be remedied at a trifling expense compared to that which may eventually become necessary if allowed to continue for a short period without attention.

When making an examination respecting the sanitary condition of the drains and fitments of any building, it is necessary that the whole method of procedure should be systematic and thorough, or the final results will be unreliable and altogether unsatisfactory. Nothing in connection with the examination should be left to guesswork, or taken for granted, but everything that may affect the hygienic condition of the building under consideration should be exhaustively examined and tested. To do this effectually requires considerable experience, together with a large amount of judgment, time, and patience, and is altogether a very different proceeding from the superficial operations usually carried out and considered sufficient for such a purpose.

An accurate knowledge of the general plan of the drainage system, situation of outfall, the gradients and flushing arrangements of the various branch drains, and the general character of drainage discharged by each should first be obtained. The position of the intercepting and inspecting chambers should be noted. Their interiors should be closely examined, and, if necessary, tested, to see if the bottoms and benchings are sound and water-tight. It should also be observed if the branch or main channels have any tendency to cause splashing or obstruct in any way the even flow of sewage. The condition of the intercepting trap should be remarked—its degree of self-cleansing action and depth of water-seal; also that the stopper to the cleansing arm is properly fixed. The various gully traps should also be examined as regards their state, depth of water seal, &c., also whether they are rendered inefficient by the water-seal being momentumated or siphoned out by the discharge of water into the traps or the passage of sewage through the drain with which they may be connected. The provision of fresh-air inlets and foul-air outlets to the drains, whether sufficiently adequate or not, together with their position as regards the doors, windows, chimneys, &c., of the house, and the description

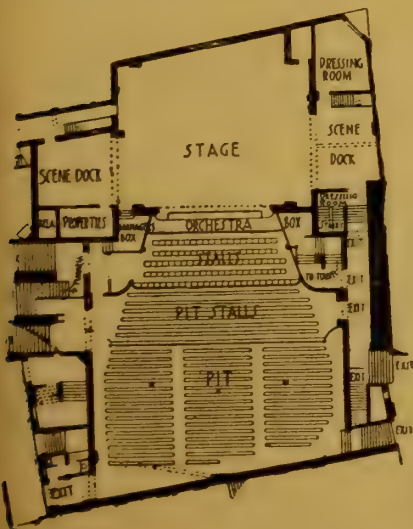


Fig. 4.

neighbours in front. In other words, there should be not less than 6in., and, if possible, 9in. difference in the levels of the seats, so that they may rise in a gradual line from the first to the last. The diagram, Fig. 6, fully illustrates the meaning of these remarks.

The Free Trade Hall, Manchester, to which I



of joint used for the foul-air extracting shafts should be noted. Also that all soil-pipes are carried up full bore and provided with wire guards at the top, that the rain-water pipes are entirely disconnected from the foul drains, and that the overflows from cisterns, safes, fitments, &c., discharge into the open air in suitable situations. It should be ascertained whether any drains pass under the building, and, if so, the character of such drain and its construction; also whether any cesspools or neglected refuse heaps are situated near the house. Any wells or underground rain-water tanks should be examined, and if used for drinking purposes, the water analysed. The course of the overflow from the rainwater tank should also be determined.

To ascertain whether the joints and pipes of the drains are thoroughly sound, various "tests" have been devised, the more important being those known as the "hydrostatic" or "water test" and the "smoke test." The details connected with the application of both these tests have already been given. The results obtained by the water test are the most trustworthy, though this test cannot always be conveniently applied to existing drains. Usually, the smoke test is adopted; but where a drain passes under any building, it is desirable to make arrangements for that portion being thoroughly tested with water. When testing drain, soil, or ventilating pipes with smoke, the test should be carried out by means of a machine which is capable of forcing the smoke into the pipes with some degree of pressure instead of simply filling them with smoke and allowing same to find its way through any defects unassisted. Having ascertained that the house-drains are disconnected from the public sewer by means of an intercepting trap and that both it and all the gully traps connected with the drains are well sealed with water, the smoke machine is attached to the fresh-air inlet of the drainage system, and smoke driven in until it is seen to escape freely at the outlets of all the soil and ventilating pipes. The outlets of these pipes (and any other openings connected with the drains) must then be securely plugged with a damp cloth or well-tempered clay, and the smoke forced in under pressure. Where a smoke machine similar to that shown in Fig. 97 is used, any defects are immediately made known by the constant falling of the cylinder connected with the combustion-chamber, in addition to the smoke being seen to issue through any imperfect joints or other defects. In places where it is not convenient to attach the smoke-machine to the fresh-air inlet, the smoke may be driven in through any gully-trap that may be suitably situated for the purpose, the water-seal being first removed.

It is important to notice that the smoke issues freely from the ventilating pipes or foul air extracting shafts without any restriction whatever, in order to make sure that they are properly carrying out the object for which they were intended. The bend at the foot of a foul air extracting shaft has been frequently found completely choked with rubbish, iron rust, &c., thus being rendered utterly useless for ventilation or foul air extraction purposes. In the same way, where a mica flap fresh-air inlet is fixed, it should be ascertained that the inlet pipe is quite clear, more particularly at the bend, and also that the mica flap valve is working properly. When the external drains and soil-pipes are being tested with smoke under pressure, it should be observed if there is any escape of smoke inside the building through any defective closet-traps or joints on the branch soil-pipes.

The examination and testing of the whole of the external drainage system having been completed, the condition and efficiency of the internal sanitary arrangements should be ascertained. It is desirable to commence at the basement or lowest floor of the building, taking the successive floors in regular progression, and carefully examining every room. All pipe-casings, inclosures to baths, water-closets, &c., should first be removed, so that the whole of the fittings may be exposed to view, and the course of the various pipes traced throughout their length.

Any trapped gullies situated in the cellar or basement, and directly connected with the foul drains, should be noted for removal, as the trap is liable to become unsealed through evaporation. When cellar or basement floors require washing they should be cleaned down with water and a cloth or mop, instead of gully-traps being fixed to carry off the dirty water from the floors. In cases where it is absolutely necessary to provide

for waste liquids being conveyed from the cellars or basements, they should be removed by means of surface channels discharging over a trapped gully outside the building. It should be seen if the kitchen, scullery, and butlers' sinks are properly trapped, and if the traps are each provided with an anti-siphonage pipe. Also that the waste-pipes are disconnected from the drains and discharge over trapped gullies. Where anti-siphonage pipes are fixed, they should be examined as to whether the air-way is free, and not in any way blocked with dirt. If anti-siphonage pipes are not provided, the traps should be tested in order to ascertain if any of them can be untrapped by the water-seal being siphoned or momentum out.

The details of construction of each water-closet apparatus should be carefully noted, especially in the following particulars:—The volume and force of flush obtainable, the cleansing properties of the basin and trap, whether provided with anti-siphonage pipe or not, liability of water-seal to be broken by siphonage or force of momentum, character of joint between trap and soil-pipe, also between trap and anti-siphonage pipe, if supplied from water-waste preventer or a cistern properly disconnected from the general water supply, and whether the water-closet chamber is thoroughly ventilated. Such points as those mentioned should be observed, whatever the type of closet under examination, whether wash-down or valve pattern. In addition, valve-closets should be provided with a tray or safe having a waste-pipe discharging into the open air and fitted with hinged flap-valve, also an air-pipe to the valve-box discharging into the open air; and the closet basin should have an overflow weir discharging into the safe, or a deeply-trapped overflow arm discharging into the air-pipe. In the latter case it should be observed whether the overflow arm receives an adequate supply of clean water on each occasion that the closet is flushed. The valve under the closet-basin must also be examined as to whether it fits closely to its seating.

All baths, lavatories, urinals, &c., should undergo a similar minute scrutiny as already indicated for water-closet fittings. It should be seen that the wastes are trapped in every instance, and the waste pipes traced to make sure that they discharge into the open air over trapped gullies, and are not in any way connected to the drains. The character of the overflow pipes and the condition of their interiors should also be noticed.

The position and general arrangement of the domestic water-supply must be carefully examined. It should be observed if the cisterns have well ventilated surroundings, easily accessible, provided with covers, and the overflows discharging into the open air well away from any chance contamination with sewage or sewer air. The water service to the water-closets, &c., should be completely disconnected from the remainder of the domestic supply.

Small tubes containing a quantity of smoke-producing material and known as "smoke-rockets," are sometimes used for testing short lengths of drain or soil-pipes. When lighted, they emit a dense yellow or black smoke with pungent odour. Smoke-rockets are very portable, and oftentimes convenient; but a smoke test of this description is much inferior to that afforded by a good smoke machine which forces the smoke into the drains with a slight degree of pressure.

What is known as the scent-test or "smell-test" is also occasionally used in the examination of drains and soil-pipes. Certain substances, having a very penetrative, distinctive, and easily-recognisable odour, are introduced within the drains or soil-pipe at a convenient point (the outlets and drain openings having been previously plugged or sealed), so that the odour may permeate the whole system. Any defects are then made known by the sense of smell of the person making the examination. This test, though convenient under some circumstances, is not so reliable as the smoke-test. Oil of peppermint is most generally used for the scent-test. This should be mixed with a quantity of boiling water, and immediately discharged into the soil-pipe through some conveniently-placed water-closet. The mixture must be poured into the soil-pipe by an assistant, and the closet afterwards well covered with damp cloths; otherwise the odour of peppermint is liable to be carried through the house, and the test rendered ineffective. Small glass phials filled with a powerfully-smelling mixture may also be bought ready prepared for use in carrying out similar smell

tests; but whatever the character of the test employed, it is necessary that the greatest care should be exercised if accurate and satisfactory results are required.

THE END.

## CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXVI.

By JOSEPH HORNER.

GIRDERS and stanchions are so plain that there is no difficulty with their patterns. It is usual always to give these an abundance of taper, Fig. 104. The taper is imparted to the inside of the flanges—say  $\frac{1}{4}$  in. in a depth of 3 in. or 4 in. Outside there is scarcely any given or

FIG. 104.



FIG. 105.

needed. Fig. 104 shows how the pattern should be made. Fig. 105 shows a faulty construction, undesirable, because the edges of the stuff at *a a* are liable to overlap and tear up the sand in moulding.

Fig. 106 shows a stanchion pattern in section. The top rib *A* should be doweled on, as shown, in the plane *a—*, to lift in the top sand, which lessens the risk of fracture and consequent work of the moulder. It is not necessary to joint the

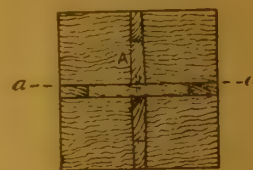


FIG. 106.

end flanges along *a—* provided the rib is left loose. A truer end-face will be obtained by not jointing the flanges.

Plain cantilever patterns are made as shown in Fig. 107. From a pattern made thus several dozens can be moulded. The plate is jointed in three pieces with halved joints, and then cut to outline. The flanges are screwed around the edge of the plate, and the beading also on top and

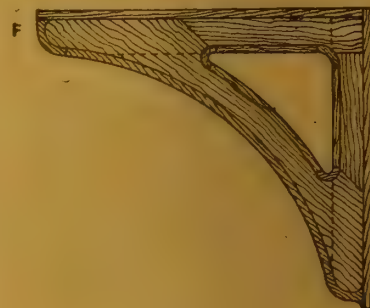


FIG. 107.

bottom faces. The timber shading shows how the grain is best arranged for strength. This example is typical of much light-framed pattern-work.

In a previous paper I spoke of the necessity of supplying a foundry with templates, in preference to giving dimensions or sketches, or as supplementary thereto. Even if it be but an angle for a piece of branch pipe, or for a bracket or flange, it is always safer to screw two strips of wood together to the angle required, and send that along with the sketch. A few examples of



templets are shown in Fig. 108, suitable for gratings and other work. A is a templet for a casting in which the edges are bevelled, as, for example, in gratings going round a polygonal area. B is a templet having a corner cut out where the casting has to clear a projection of some kind. At C the projection comes in the centre of the end. D is a templet of a segment of a circle. Of course, in all cases it is the outer edges which are the working edges, the inner being of no account, but dependent on the width of the strips used. Templets liable to diagonal rocking should have a strip nailed across to preserve the correct outline.

In contractors' ironwork fractures sometimes occur. Occasionally such fractures can be repaired by patching, but more often new castings are necessary. But the making of new castings often involves the cost of making new patterns, either because of the cost of, or delay, in transit from a distant foundry, or because they are of designs or dimensions no longer kept in stock, as in the case of parts of plant and machinery. Especially in remote shops, in the case of breakdowns, where loss of time is loss of money, and in cases where exact finish and

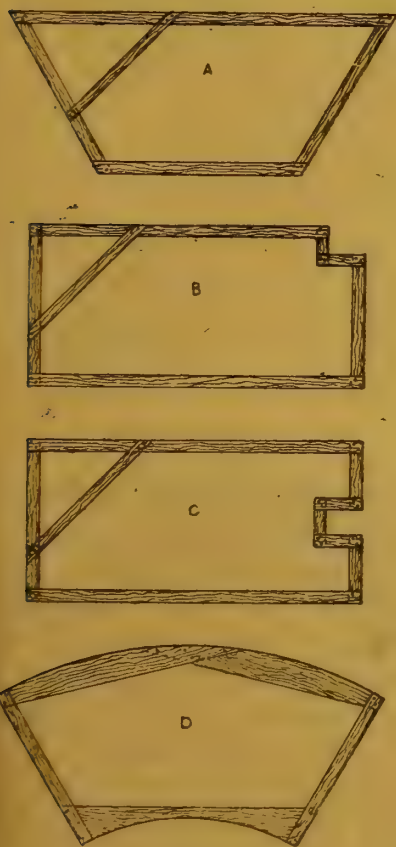


Fig. 108.

accuracy are of relatively small account, it is often desirable to take a mould from a broken casting. These, when fractured, can often be utilised for moulding from, and in this way the cost of a new pattern can be saved. This is not, however, the case with all castings, but it is with many. Contractors know that moulds are often made from fractured castings without the necessity of incurring the cost of a new wood pattern; yet the foundry people will often say they cannot mould from the fractured parts, but must have a pattern, which often costs more than the casting.

Moulders, as a rule, prefer to work from a nice new, clean, smooth wooden pattern, to working from a broken casting. An intimate knowledge of foundry work is required to understand the class of jobs which can profitably be moulded from, and the class which cannot. The following remarks will, however, give some trustworthy ideas on the subject to the readers for whom these papers are written.

Probably the kind of contractors' castings most likely to fracture are pieces of piping, pulleys used for hoisting tackle, cog-wheels, castings for jib heads of cranes, trolley wheels, all forming portions of plant.

While some castings can be moulded from very easily, others can not. If such are badly broken, it is difficult to set the broken pieces in the mould in their correct position; the difficulty is enhanced if their forms are irregular and intricate. Flat plated work is easier to mould

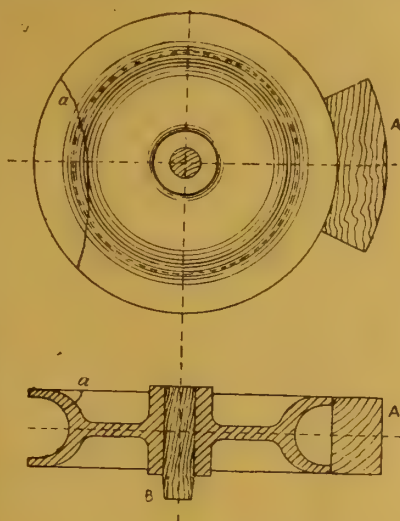


Fig. 109.

from than curved or circular work, and shallow work than deep. In the case of intricate work, not much broken, a good deal can be done with cores. Light work, though broken, may often be cemented together sufficiently strong to allow of a mould being taken from it.

Sometimes deep vertical iron faces are so rough that they will not deliver cleanly from the sand, rendering much mending up necessary. In such cases, if mending up is objectionable, pieces of loam cake may be laid along in the mould to form the faces. Or a thin layer of wood may be rammed against the rough face of the casting, and form the face of the mould. When not used for this purpose it is necessary in all castings except the smallest to make the mould larger than the broken casting, in order to allow for shrinkage, and this is usually done by ramming strips of the correct thickness required for that allowance against the sides of the pattern.

There are really few broken castings that cannot be moulded from; but then it would sometimes be more costly to do so than to make a pattern. Yet in many cases it would be a question of relative cost. Some castings are more liable to fracture than others. In such cases it is better to make and keep a pattern in readiness for use. Again, there are many castings for which the cost of preparation for moulding would nearly equal that of a new pattern, and would then fail to yield a good mould. Any broken castings that involve a lot of core-box

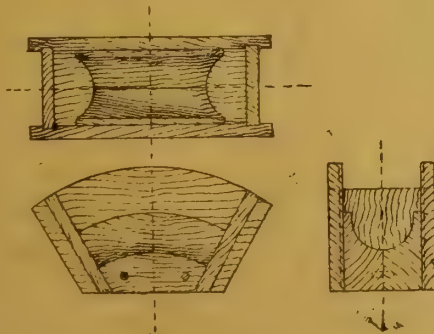


Fig. 110.

work in order to utilise them for moulding, would be better discarded in favour of a wooden pattern.

There is no difficulty, and no objection on any grounds to moulding from a plain, or tolerably plain-plated article with no recessed portions. It is when recessed parts occur that the question of the making of a wooden pattern has to be considered. A plain belt pulley, or a barrow wheel, or a running wheel with a single flange—all so well-known examples that I need not illustrate them—can be utilised for moulding from. But a double-

flanged running wheel, or a chain or rope pulley, cannot be moulded from unless the recesses are cored out. But this is easily done thus:—Suppose the sheave pulley, Fig. 109, to be fractured at *a*, as often happens, then a segmental print, A, a few inches long is fitted to the outside of the sheave pulley, and worked by the moulder round by the edges of the broken casting, and the sand is rammed against the perpendicular faces of A. Then there is a core-box made to fill up the print space, and to core out the recessed portion of the casting. Fig. 110 shows the core-box, and six or eight of such cores will complete the circle. The centre hole in Fig. 109 is plugged up, and the end of the plug forms a core print B. If the hole has to be bored out, the print must be turned  $\frac{1}{16}$  in. less in diameter than the hole. Precisely the same method will be adopted in the case of a double-flanged trolley wheel.

When moulding from broken parts in metal, the moulder cannot stick his spike in for rapping and withdrawal as in wooden patterns. It is desirable, therefore, when time will permit, to drill holes for rapping, and screw holes for lifting, in the broken casting. When this is not done, the rapping must be done on the edges, and the lifting by the fingers, or with wire or string put underneath the broken parts before ramming them up. In some cases holes already in existence in the parts can be utilised for rapping and lifting by, being left just as they are, or else filled up with plugs of wood into which the spike or screw can be driven. In Fig. 109 the spike for rapping and lifting can be driven into the wooden plug B.

Broken pipes and columns are very easily moulded from. If the pipe in Fig. 111 is broken, as at *a* and *b*, a new casting can be made from it

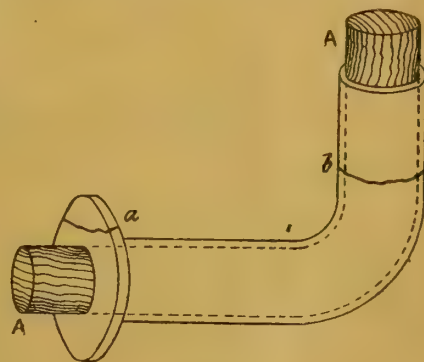


Fig. 111.

by filling the open ends with projecting prints, A A. The core is struck just as though a wood pattern were used.

#### DOMESTIC ARCHITECTURE IN WASHINGTON.

AN interesting contribution on the "Domestic Architecture of Washington City," by Mr. Glenn Brown, appears in the present number of the *Engineering Magazine*. He draws attention to the advantages of a regular plan in the laying out of that city which the foresight of Peter Charles L'Enfant and Gen. Washington had provided. President Washington gave personal attention to the scheme, which was authorised by Congress in 1790. He and his colleagues "carefully selected the sites of the great edifices where they would command the greatest prospect and be susceptible of the greatest improvement," and after these sites were selected, avenues were laid out, radiating from the Capitol and president's house, and one or two other important points. By this arrangement views of the Government buildings were secured, and direct access to all parts of the city obtained. The square, triangular, and circular parks at the intersections of the avenues and streets give breathing spaces and opportunities of seeing the buildings. Mr. Glenn Brown prints a few typical plans of houses which have been erected at the various corners and junctions, and which difference of shape of building gives Washington a variety and picturesqueness not found in other cities in the States. Congress also granted a right to break the building lines by allowing certain parts of the fronts to project in the form of bay and oriel windows, towers and porches. It must be mentioned that the Government owns the streets and parks. One plan shows an acute-angled



plot made by the intersection of an avenue with streets, and there are many such acute corner plots. The plan in question is "The Simpson House," located on Rhode Island-avenue and P-street, in which the legal rights have been skilfully utilised. The corner has a three-quarter circle, which cuts off the acute angle by a "give-and-take" arrangement, and this is made the parlour. The hall is formed between this room and the remaining part of the wedge-shaped plot; it gives access to the parlour on the right and to a small sitting-room on the left, which has a projecting bay window to one front. A large dining-room runs from side to side, with windows at each end, and opens into the small sitting-room, although a separate passage at the back of the latter room, gives direct access from the hall to it. The staircase is arranged as a projection on the other main front at the rear end of the hall. This mode of turning the angle with a circular bay is a striking feature in many of these plots. In other instances the triangular space has only one front towards the street, the rear running to a point. Lieut. Herwig's house is of this type. These houses are of wedge shape, the wider end being the front to the street, and the sides radiating backwards. The writer says, "It has been a custom in laying out lots to run the lines, where possible, at right angles to the street fronts," and one or two plans are given to show this arrangement. Many illustrations are given of residences and buildings, including the "Boardman," the Tuckerman houses, Senator Hale's house, the Leiter residence, Senator Hearst's house, many of these being large and palatial structures in the Italian Renaissance and so-called "Romanesque" styles. The interiors are in some instances commonplace and unsatisfactory; but though the details and decoration of the buildings are often coarse and redundant, these examples are sufficient to show the progress of a higher taste.

#### FACTORY CONSTRUCTION AND FACTORY ACTS.—III.

By GEORGE H. BIBBY, F.R.I.B.A.

##### MEANS OF EXIT.

IN certain factories, where workpeople of both sexes are employed, the difficulties of planning are increased by the necessity for providing, not only separate staircases, exits, lavatories, and closets, but, also in some factories, separated workrooms. In many establishments such separation is practically impracticable, yet the system obviously has many advantages, both for employers and employed.

In Figs. 4 and 5 are shown the ground and first floors respectively of a factory possessing several advantages, including the means of separation, on each floor, of the male and female workpeople if required. The only approach is from the front next to the street, and the site is so placed that there are no means of lighting or ventilating from the remaining three sides.

The staircases are situated so as to afford two means of escape from the upper floors, and at opposite extremities of the factory. They are intended to be of fire-resisting materials, such as stone or concrete, and to contain not more than 12 steps in each flight, and without "winders," and in both instances would be inclosed within substantial brick walls, and with a central wall of brickwork; handrails would be placed on both sides, and all doors usable as exits would be arranged to open outwards towards the staircases, or, at those points where either of the staircases might be used, the doors would swing both ways, as shown by the doors leading to the bridge on Fig. 5. In arranging the doors leading to the staircases, care has been observed to prevent the outward-opening doors from lessening the passageway on the staircase landings, and the lifts are arranged so as not to endanger either of the staircases by conducting fire or smoke to those portions of the building. The water-closets and lavatories are particularly well placed, having in view the disadvantages of the site of the factory, and the open iron bridge affords a means of escape towards both staircases; a further precaution has been observed by arranging the windows to open, and with the special object of enabling the workpeople to avail themselves in case of necessity of movable fire-escapes.

In the Factory and Workshop Act, 1895, section 9, is a provision which is calculated to prevent the exits and passages connecting workrooms with staircases from being adversely

affected by machinery in motion. Sub-section 1 recites as follows:—"In a factory erected after the commencement of this Act, the traversing carriage of any self-acting machine shall not be allowed to run out within a distance of 18in. from any fixed structure, not being part of the machine, if the space over which it so runs out is a space over which any person is liable to pass, whether in the course of his employment or otherwise." In this and other respects the Act of 1895 makes useful rules with the view of preventing any obstacles arising from machinery in motion from interfering with the exits to the doors and staircases of factories and workshops.

The factory shown upon Figs. 4 and 5, having its only exits at the front of the premises, is without some advantages; but in large numbers of factories, where back exits only are provided for the workpeople, these frequently open upon small courts or narrow passages where it would be difficult to bring in fire-escapes, or to procure the sufficiently rapid exits of the workpeople, many of whom in the event of fire linger too long upon the premises in their efforts to save their working tools or clothing, &c.; but if back doors and windows should be provided, the former should always be kept unlocked during working hours, and some, or all, of the windows should have opening sashes, or casements, sufficiently large in area to allow adults to pass through without difficulty, either to the movable fire-escapes which may be provided under the Factory and Workshop Act, 1895, section 10, or to the canvas shoots now so frequently provided from the higher floor levels of factories, and in the use of which workpeople are in some factories periodically exercised.

"Show me the back windows of a man's dwelling, and I will tell you his character," is a remark capable of extension to some factories and factory owners, and it is to be regretted that some of the finest factories (erected without regard to expense in many respects) not unfrequently exhibit in their plans and detailed arrangements a terrible disregard or ignorance of what is due to their workpeople as regards their safety, health, and comfort during those unduly protracted hours of labour, which so frequently

and unduly exceed the time allowed for rest, meals, and recreation combined.

The Factory and Workshop Acts of 1891 and 1895 contain provisions greatly tending to promote the better structural arrangement of such buildings and their improved sanitary condition. Amongst the special provisions in this latter respect is that contained in section 30 (Factory and Workshop Act, 1895), which states: "In every factory or workshop where lead, arsenic, or any other poisonous substance is used, suitable washing conveniences shall be provided for the use of the persons employed where such substances are used." That it should, so late as the year 1895, be found requisite to frame a special clause in an Act of Parliament for the purpose of securing workers with poisonous matters with suitable lavatory accommodation, will surprise many who may consider that such accommodation should be afforded to all workpeople, whatever the nature of their employment.

Previous to the year 1844 the word "factory" had not a meaning clearly defined by law; but an Act was then passed which recited that the word "factory" "shall be taken to mean all buildings and premises situate within any part of the United Kingdom of Great Britain and Ireland, wherein, or within the close or curtilage of which, steam, water, or other mechanical power shall be used to move or work any machinery employed in preparing, manufacturing, or finishing, or in any process incident to the manufacture of cotton, wool, hair, silk, flax, hemp, jute, or tow"; and in the Factory Acts of the years 1860, 1861, 1864, 1867, and 1878 the word "factory" had a gradually extended use.

In the first Factory Act of 1802 the words "mill" and "factory" were quite interchangeable terms, "cotton mills" and "cotton factories" meaning the same thing.

By the Factory and Workshop Act of 1878, factories were first divided into textile and non-textile factories, and any place where a manufacturing process was carried on that was not included in those divisions was called a workshop.

Without going minutely into the full meaning of textile and non-textile factories, it may be

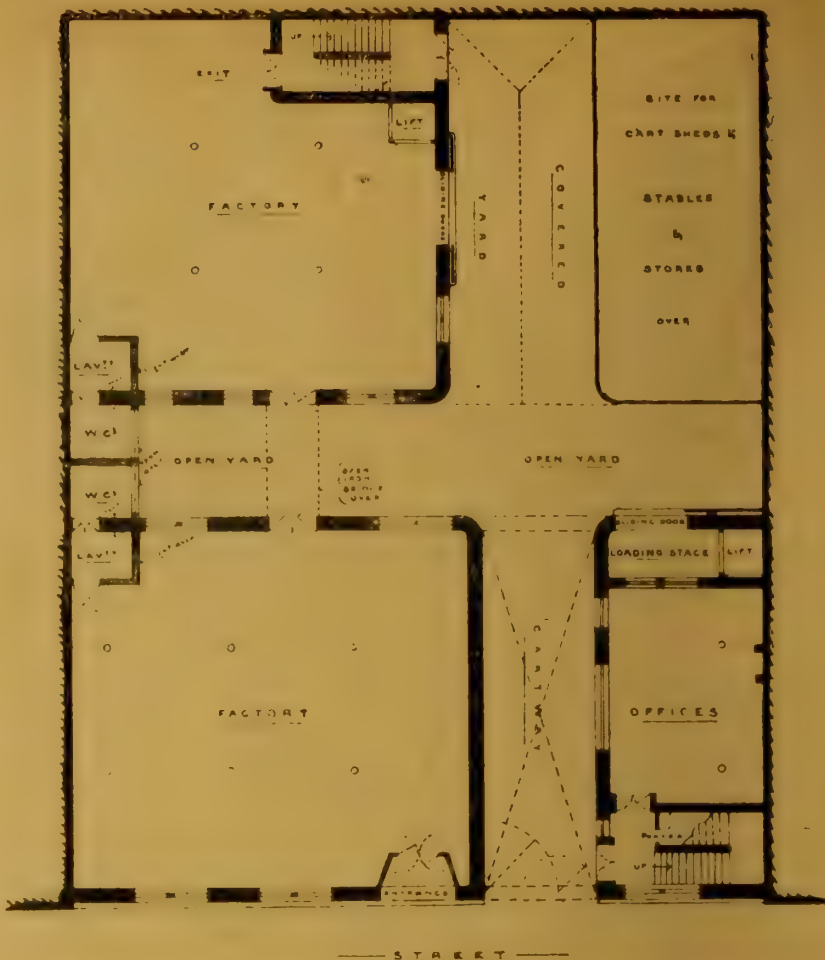


FIG. 4.



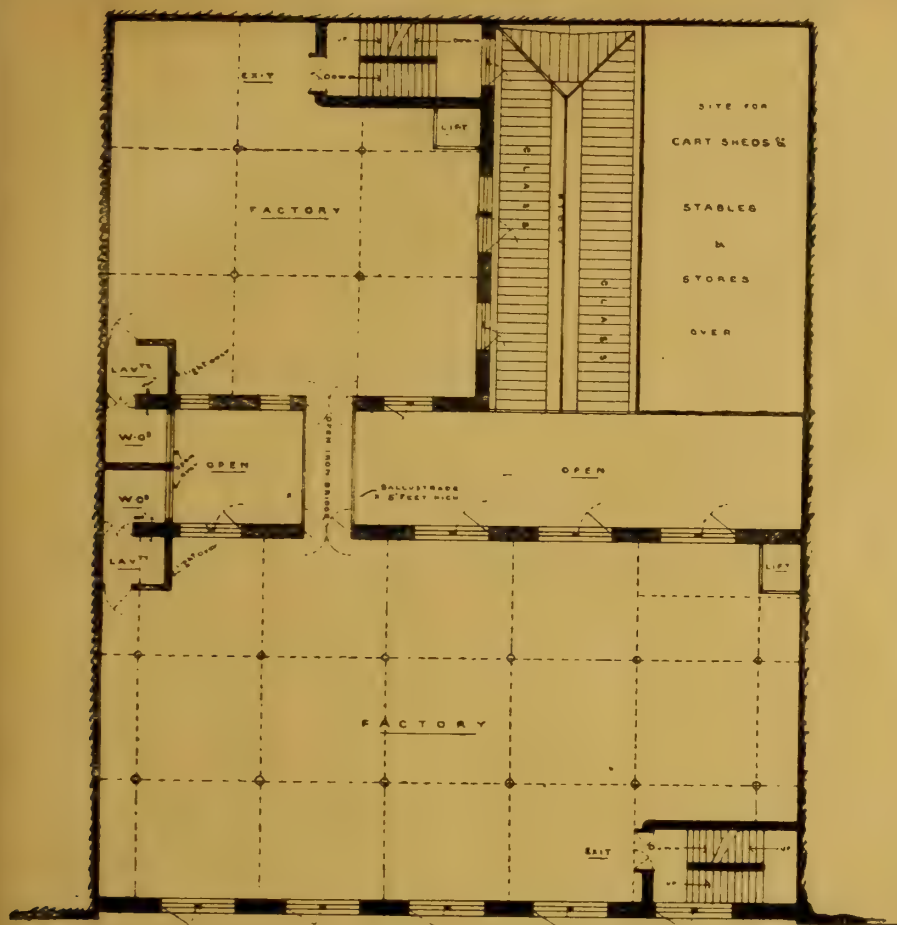


FIG. 5.

stated, roughly, that a factory (in law) is a place where foreign motive power is employed in a manufacturing process, and that other places where only manual power is used are, but with some exceptions, workshops.

Although the first Factory Act was not passed until the year 1802, yet the modern factory system may be said to have had its origin in the successful establishment of a large silk-mill or factory on the banks of the Derwent, near Derby, in the year 1718, where it was placed to secure the necessary water-power.

The plans and details for the erection of this factory were prepared under circumstances of danger and great difficulty, and were, in fact, copied secretly (at the risk of his life, by a young Englishman) from a silk factory at Leghorn, in the year 1715. Drawings and details were made during the night, and forwarded to England concealed in bales of silk, for at this period everything connected with such buildings and machinery was kept as an Italian secret.

As a result of the disclosure of the system upon which the Italian factory and its machinery were constructed, the great silk-mill at Derby was erected. It was built five stories in height, and is said to have resembled generally many others yet to be seen in the factory districts. A drawing of the factory appears in Knight's "Old England," where two tall chimneys are shown, as steam was not then in use (although added at a later period to this factory); the utility of the chimneys may be explained by assuming them to have been connected with a system for warming the building, which is said to have been specially arranged upon account of the great extent of the buildings, which are said to have been one-eighth of a mile in length, 32 ft. in breadth, and to have cost £30,000; not a very large sum according to modern ideas (considering the size of the erections). The factory was divided into eight large apartments, lighted by about 500 windows. The foundation was formed on an island swamp (for water-power reasons), and on oaken piles, 16 ft. to 20 ft. long, driven close to each other; over this consolidated mass of timber was laid a bed of stone, from which were turned stone arches to carry the walls. Upon the whole, and in view of the fact that modern factory and building Acts were not then in force, the erections appear to have

been far superior in many respects to important factories of a later date.

(To be continued.)

#### HOME ARTS AND INDUSTRIES ASSOCIATION EXHIBITION.

THE twelfth yearly exhibition of this useful and enterprising society was opened under the patronage of the Princess of Wales at the Albert Hall yesterday. The classes on this occasion seem to be as well represented as heretofore; but it must be confessed that the gathering does not present anything of special or individual merit, such as would make any decided development either in craftsmanship or design. No doubt the object of the association is rather devoted to the general average production, and this standard is fairly well maintained; but it seems a matter of regret that no branch seems to be able to obtain designs distinguished by any marked originality or new development. Presumably lack of available funds wherewith to pay the competent designers for fresh ideas continues to hamper the work of the more competent executants such as exhibit from Stepney, Pimlico, and the Chiswick branches, whose work we fancy ranks among the best. The most extensive collection by one exhibitor is the handsome show of Della Robbia Pottery, from Birkenhead, including some figure panels and friezes of an architectural character well worthy of attention for moderate use in contemporary building. Much of the modern terracotta work which we see erected partakes too much of the limitations of mere "crockery" in its forms and details; but there is no reason whatever why, with judicious taste, the Della Robbia ware should not be taken in hand. One panel of two tiles we noticed after a figure by the late Ford Maddox Brown. Some of the pots and plaques are capital in form and colour. The tall copper fenders with repoussé ships and standard brackets on which to stand pots and kettles, are marked for prizes and come from Gattendon. They are quaint and well executed, but surely would keep the fire warmth from the feet, and besides the stands' tops are not large enough to accommodate plates and dishes—a need often felt at luncheon-time in

most houses. A brass fender in open fretwork, with owls spreading their wings 'twixt the setting sun and the stars, is a very capital piece of workmanship from Fivemile Town, Ireland. From Stepney some inlay-work again pleases us, such, for example, as the long string of geese, adapted from a quaint design by Mr. C. F. A. Voysey; but its application to a fender-box, with this delicate intarsia work close to the floor, seems very much like a mistaken use of ornament. The same remark applies to a form or bench in walnut with inlay squires composed by Miss de Grey. The Countess of Lovelace has designed a writing-table with inlays of odd and not ungraceful form, made by the Pimlico class, from cartoons by Miss Mabel de Grey, and hard by there is a shallow hanging cupboard, enlivened in the panel door by a procession of monks and mushrooms midst the trunks of trees, one of the best pieces of conventional design in the gallery. From Ratcliffe, Mr. E. Kibblewhite exhibits a little oak settle, described as an "adaptation," but it is a very amateurish production, much lacking in uniformity of scale and idea, lumpy in parts and thin in others, though we are bound to remember it evinces a great improvement on the part of the producer, whose work we have noticed before. The pigs on the verge-board of this settle are really very good, though out of sight rather. The coarse carving from Penwith and Altrincham we do not admire, and the cabinet sent under the auspices of the Kent County Council from the Loose class reminds one of the poorest productions of the Tottenham Court-road.

#### THE INSTITUTE OF BUILDERS' CLERKS.

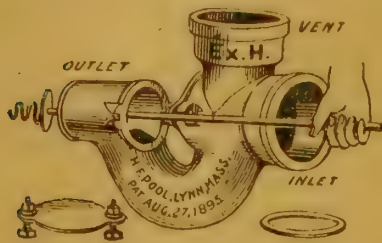
THE prospectus and copy of rules of this newly-organised society have just been issued, and will be forwarded on application to the hon. secretary, Mr. J. Pearse Bowditch, of 94, Dalberg-road, Brixton, S.W. The objects of the Institute are to introduce clerks of good character and business ability to employers, and to elevate the status of the profession by raising the standard of technical and professional education among members, and checking the downward tendency of salaries by aiding thrifty and capable men to a position of greater independence, supported by the moral influence of the Institute. Members will be insured against loss through want of employment, sickness, accident, or death; it is also intended to promote good-fellowship, and facilitate the spread of knowledge by meetings in each branch, and to assist members with legal advice in case of necessity. The Institute will be managed by a council of delegates from the district branches, elected by the members, and by a president, vice-president, treasurer, secretary, trustees, and auditors. There will also be an executive committee, at the central offices, of twenty members, elected annually, and it is proposed that each district shall appoint its own local secretary and committee. The basis of membership is a wide one: all clerks above 18 years of age who have been three years in the building trade and twelve months in one situation being eligible. The Institute will, at all its offices, keep registers of all situations vacant, and it is proposed to issue a gazette (monthly at first) giving particulars of situations required by members, indicating the member's identity by a number only. The members and agents of the Institute will keep the secretary informed of all vacancies about to occur, and the executive promise to use every means to suitably place every member who may be out of employment. Benefits are offered to members in four sections. Of these, A combines the general privileges of membership, with uniform out-of-work benefit of 10s. for first four weeks, diminishing to 8s., 6s., and 5s. every four weeks, in accordance with a table divided into three grades. Thus, a member in class B, for a subscription of 9s. per quarter, with an entrance fee of 5s., would receive (in addition to the general advantages of the Institute's organisation) a weekly allowance of £1 10s., and if out of work for six months he would draw a benefit of £24 18s. The committee provide for the privilege of resumption of benefit within a month. The Institute will also provide a reading and writing-room at its central and branch offices, and will form a reference library for use of members. Courses of lectures and demonstrations will, from time to time, be arranged for, on matters of interest to members. The insurance against sickness under Section B is optional to members; and the tables are framed



in such a way as to meet the requirements of those to whom the ordinary benefit societies are of little use. Members may insure for any amount of full benefit not in excess of their weekly earnings. Thus, for 8s. per quarter a member may receive a weekly benefit of £2, or a benefit of £27 6s. 8d. in six months, and for an additional 4s. per quarter he would be entitled to an allowance of 8s. per week for life, should he become so affected as to be permanently incapacitated. Section C provides for the insurance at low rates of a sum of £10, £15, or £20, payable on the death of a member; and in Section D medical attendance is provided for a subscription of 6d. monthly.

#### A DRAIN-CLEANING TRAP.

THE accompanying cut illustrates a form of trap intended for the house-drain, in which the novel feature is the offset that permits easy access for cleaning in case of stoppage. The trap is made with the adjacent ends arranged laterally out of alignment, with cleaning-out ports, making it convenient to clear out any obstruction that may occur between the house and the sewer, or in the run of the drain-pipe in the



cellar, as the lateral offset of the trap allows for a straight and full way in either direction. The adjacent ends and covers are milled off to an even surface, and each cover is held in place by two large bolts, using large brass nuts, with a rubber or lead washer, making a tight cover and one easily taken off and put on with a common wrench. These traps are made by the inventor and patentee, H. F. Pool, 5, Market-street, Lynn, Mass., U.S.A.

#### "PEGAMOID."

THE registered trade mark "Pegamoid" has been given to certain patented processes which have the effect of waterproofing and generally protecting any material—such, for example, as paper, leather, cotton, linen, woollen, and other cloths—to which they have been applied. Articles which have been treated by the "Pegamoid" process are rendered more durable, more elegant in appearance, and more useful. They are damp-proof and insect proof, soft and flexible, cheap and unaffected by changes of temperature and climate. "Pegamoid" brand leather is expected to supersede the real Morocco leather, for it is cheaper and looks equally as good, and it will not stain or rot. Printed papers so treated are washable; they keep their colours, and they will not spot or stain with rain or damp. So easily applicable is this patent process that there is hardly a thing in daily use in domestic and commercial life to which it may not be applied with advantage. Imitation leathers are made so as to resemble various qualities and grades of the different hides and skins in ordinary use. Not only is the rich surface appearance of the best leather imitated and even excelled, but the "feel" of the imitation is exactly the same. Imitation morocco is principally used for upholstering purposes, and it is made in any colour. The ordinary grain of the leather is obtained with perfection, and any fancy embossed pattern can be produced with an effect only equalled by the best and most expensive skins. The special advantages of the material for upholstering are:—*Durability*.—The surface being hard and horny, although flexible, it can only be scratched with difficulty, an obvious advantage over real leather which will be appreciated by everybody. *Waterproof*.—This characteristic renders it possible to wash and scrub (even with boiling water) the articles so upholstered. *Stain Proof*.—It is not damaged by grease or acids. Permanent stains and consequent rotting are thus avoided. *Richness of Texture*.—The surface appearance is like that of the best skins. Yet, while the surface itself is hard and

resisting, the leather is, nevertheless, soft, flexible, and easily worked up.

Waterproof cloth, treated by "Pegamoid," possesses many advantages. Posters will not chip or rot in the severest weather; they surpass the enamelled iron sign, being lighter in weight and capable of receiving printed colours of far greater brilliance and variety; they can, of course, be scrubbed clean at any time, and hence secure a cheap, lasting, and effective outdoor advertisement. Maps printed on this material serve their purpose far better than those printed on paper or cloth. For naval and military charts and for cyclists' touring maps it should replace the old style, as it is impervious to damp.

When wall and ceiling papers have been treated they are damp proof, and may be washed down; but no troublesome varnishing is required, and there is no necessity to have a polished enamelled surface. The softest of "Liberty" tints and tones may be used; there is, in fact, not the smallest appearance of a varnished or enamelled paper of the old-fashioned kind. Besides, the treatment of the paper renders it proof against insects, so that it is absolutely sanitary as well damp proof; and if the wall or ceiling be soiled by a smoking lamp the black may be removed with a wet sponge. Printing papers derive the same advantages, besides which, the lasting qualities of the paper so treated render it of great value for costly books and official records. Messrs. C. and J. G. Potter, of London and Darwen, have secured exclusive licenses for treating all kinds of wall and ceiling paper as well as other kinds of papers; Messrs. Eley Bros. have secured the right of making "Pegamoid" brand cartridge cases, and, having sold many millions of these cartridges during the season of 1895-6 they write that the cases have been "subjected to the severest tests and criticisms of the sporting world with highly satisfactory results." Messrs. David Moseley and Sons, of Manchester, have acquired the right to use the invention for treating cloth and linen cloth, and state that since the grant of the license was made they have applied the patented processes to cotton, linen, and union fabrics for numerous purposes with satisfactory results, and they add this significant remark: "With respect to machine beltings, we have had belts made from the patented materials running for some months, and we are of opinion that they are the best belt we have used. Samples submitted to Messrs. Kirkcaldy and Co., of London, exceed, in tensile strength that of any previous samples submitted by us to them"; and Messrs. Rylands and Sons have entered into a contract for licenses in connection with their enormous business of Draperies, Clothing, &c. Further, Messrs. W. H. Smith and Son, after experimenting in printing upon paper and cloth, have been convinced of their great utility, and they write that "specimens of posters, which have been exposed in trying positions for eight months show practically no change in colouring or clearness of design." Messrs. Smith and Son have, consequently made arrangements to use the cloth and paper in their extensive business in maps and advertisement sheets. The interest of the architect and builder will, of course, be centred mainly in the art fabrics and wall papers, which will be found worthy of careful attention. "Pegamoid" is in the hands of Messrs. Joseph J. Byers and Co., the sole general agents, of 40, King-street, Cheapside, and will soon be prominently brought before the public. It is a really wonderful invention, and destined to affect almost every branch of manufacture beneficially.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual business meeting for the election of council and standing committees for the session 1896-7 was held at 9, Conduit-street, W., on Monday night. Mr. F. C. Penrose, F.R.S., the retiring president, occupied the chair. The scrutineers reported the following as the result of the voting, an asterisk (\*) prefixed to a name denoting member of council for 1895-6. Council.—President: Professor George Aitchison, A.R.A. Vice-presidents: W. M. Fawcett, F.S.A.; Ernest George; Alexander Graham, F.S.A.; Aston Webb, F.S.A. Hon. secretary: Wm. Emerson. (All the above were unopposed.) Ordinary members: John Belcher, T. Blashill, J. M. Brydon, W. D. Caroe, F.S.A.; A. Cates, T. W. Cutler, Campbell Douglas (Glasgow), H. L. Florence, J. A. Gotch, F.S.A. (Kettering);

E. A. Gruning, C. Hadfield (Sheffield), E. T. Hall, B. Ingelow, E. W. Mountford, J. Oswald (Newcastle-on-Tyne), John Slater, R. Phené Spiers, F.S.A.; P. Waterhouse. Not elected: Percival Gordon Smith, H. Heathcote Statham, R. Selden Wornum, William Young. Associate members: W. H. Atkin-Berry, J. S. Gibson. Not elected: A. S. Flower, F.S.A.; T. M. Rickman, F.S.A. Representative of the Architectural Association: A. Beresford Pite. Representatives of allied societies: W. L. Bernard (Bristol), A. M. Bromley (Nottingham), T. Drew, R.H.A. (Ireland); J. Ely (Manchester), W. Heaman (Birmingham), H. Perkin (York), A. Thorne (Devon and Exeter), E. M. Bruce Vaughan (South Wales), and T. Lennox Watson (Glasgow). Auditors: E. Woodthorpe and O. Fleming.

The report of the scrutineers added that the following were the results of the voting on those nominated for the four standing committees:—

Art Standing Committee.—Fellows (10): Ernest George, Alfred Waterhouse, John McKean Brydon, John Belcher, Edward Ingress Bell, William Douglas Caroe, Edward William Mountford, James Brooks, Sir Arthur Blomfield, and John Macvicar Anderson. Not elected: William Young, Ralph Selden Wornum, and William Samuel Weatherley. Associates (6): Henry Thomas Hare, A. Beresford Pite, Owen Fleming, John Begg, James Siwwright Gibson, and William Henry Romaine-Walker. Not elected: George Campbell Sherrin, George Kenyon, and William Arthur Webb.

Literature Standing Committee.—Fellows (10): Alexander Graham, Richard Phené Spiers, Arthur Edmund Street, Paul Waterhouse, Henry Louis Florence, Benjamin Ingelow, Sydney Smirke, Charles Harrison Townsend, William Frederick Unsworth, and John Hebb. Not elected: George Henry Bibby. Associates (6): Andrew Noble Prentice, Percy Scott Worthington, Leslie Waterhouse, Arthur Smyth Flower, Ravenscroft Eley Smith, and Banister Flight Fletcher. Not elected: Arthur Thomas Bolton and John Tavenor Perry.

Practice Standing Committee.—Fellows (10): Edwin Thomas Hall, Edward Augustus Gruning, Samuel Flint Clarkson, Thomas Battersby, Edmund Woodthorpe, Joseph Douglass Mathews, Lacy William Ridge, Henry Cowell Boyes, Joseph Stanislaus Hansom, and Walter Hilton Nash. Not elected: Thomas Harris, Francis Sadleir Brereton, William Warlow Gwyther, Graham Clifford Awdry, Alexander Henry Kersey, and George Hubbard. Associates (6): William H. Atkin Berry, Henry Thomas Hare, George Richards Julian, Augustus William Tanner, Frederick Henry Appleton Hardcastle, and Robert Stark Wilkinson. Not elected: Francis Thomas Wilberforce Goldsmith and Thomas Edward Mundy.

Science Standing Committee.—Fellows (10): Lewis Angell, Percival Gordon Smith, William Charles Street, Herbert Duncan Searles-Wood, Arthur Baker, John Salmon Quilter, William Warlow Gwyther, Frederic Richard Farrow, Lewis Solomon, Benjamin Tabberer. Not elected: Henry Dawson and Professor Banister Fletcher. Associates (6): Thomas Locke Worthington, Henry William Burrows, Max. Clarke, Matthew Garbutt, Bernard John Dicksee, George Pearson. Not elected: Robert Langton Cole, Edward William Malpas Wonnacott, and Bruce John Capell.

#### THE PANTAGRAPH.

IN the course of a useful series on Inlaid Work in the *English Mechanic*, the writer takes occasion to explain the method of using the pantagraph, which may help some querists who are constantly seeking hints in "Intercommunication":—

"It will sometimes be found desirable to reduce or enlarge an original design, so as to suit the work in hand. To those possessing little drawing ability, the use of the pantagraph will be found of the utmost service. This may be purchased for one shilling, and even less, or, what is much better, it may be made. By a study of the sketch, its use will be understood. Should an enlargement be desired, insert the pivot in the hole at g and press the point into the drawing-board. Place a tracing point in the hole at h, and the pencil at i, under which may be fixed the blank paper. With the fingers of one hand on the tracing point, move it carefully over the design, at the same time, with the other





Design in Coloured Woods (from Pisa Cathedral—15th century).

hand, putting just sufficient pressure upon the pencil to cause it to make its mark as it travels over the paper. If the design is to be reduced, the pivot must be placed at *i*, the pencil at *h*, and the tracing point at *g*, as shown in the sketch.

"When drawings are required to be enlarged or reduced, the sliders holding the pencil and tracing point must be moved by measurement, remembering that the pivot must always be placed at *i* or *g*, never at *h*; by a little consideration this will be apparent.

"In order to make this most useful instrument a few details must be given. It consists of four perforated limbs or rules, *a, b, d, e*, of wood or metal, arranged in pairs jointed together at the

at *h*, to a pencil-holder or point-holder; *f<sub>1</sub>* and *f* are thumb-screws, which act as pivots for joining *a* and *d*, *b* and *e*. The rule *a* is pivoted to a support, *i*, which is fixed to the drawing-board; *g* is a pencil attached to the end of the rule *b*; lines traced by *g* will also be drawn by *h*, on a smaller scale corresponding to the adjustment. After having produced our designs, and cut them in the manner described, it is possible to improve them by shading."

Among the designs given by the author of the paper is one from Pisa Cathedral (15th century), which may be useful to inlay wood-workers and others.

#### OBITUARY.

The death of Mr. HENRY CRISP, F.R.I.B.A., of the firm of Messrs. Crisp and Oatley, of Close-street, Bristol, occurred on Monday last at his residence, West Park, Clifton. Mr. Crisp, who was 70 years of age, was a son of the Rev. Thomas S. Crisp, a former president of the Baptist College, Stokes Croft, Bristol. He was articled to the late Mr. Thomas Foster, architect, in the year 1845, and commencing practice on the expiration of his articles, was very soon successful in many competitions. Pining Church was built from his designs, and Stonehouse Church and the great Perpendicular church of St. Cuthbert, Wells City, underwent alterations under his care. He subsequently entered into partnership with the late Mr. E. W. Godwin, F.S.A., and together they carried out many important works, amongst others Dromore Castle for the Earl of Limerick, and Glenbeigh Towers, Co. Kerry. In the competition for the Guildhall, Bristol, the firm submitted three designs, and were awarded by Alfred Waterhouse, R.A., all three premiums, first, second, and third; neither plan, however, represented the Guildhall as it stands to-day, for after a great deal of controversy over the subject, the work passed into other hands, Messrs. Godwin and Crisp being awarded the second premium in the new competition, in which another assessor acted. Amongst local matters in which Mr. Crisp was concerned were the considerable extension and new administration department at Bristol Lunatic Asylum, the nurses' home, and new wards at the General Hospital, police-stations at Bedminster and Redland, and show-rooms and factories of the Bristol Waggon Works. Many big business premises and vicarages have been erected from the deceased's designs, and the restoration of that well-known landmark, Dundry Church tower, was intrusted to him. In 1888 he took into partnership Mr. G. H. Oatley, who had

been associated with him since 1879, and in 1894, the firm, in conjunction with Mr. W. S. Skinner, won an important competition for a lunatic asylum for 2,000 patients at Winwick, in Lancashire, for which the estimated cost is over a quarter of a million. This work is still in progress. Mr. Crisp had been since 1889 a Fellow of the Royal Institute of British Architects, and some years since served on the council of the Institute. Until a month or two ago he was president of the Bristol Society of Architects, but owing to failing health he resigned that position. His strength gradually weakened, and very early on Monday morning he passed away. We gave Mr. Crisp's portrait with a biographical notice in our issue of Jan. 17, 1890.

#### CHIPS.

New board schools are approaching completion in Bracraft-street, Cleethorpes, near Grimsby. Mr. Croft is the architect, Mr. Marrow the contractor, and Messrs. Illingworth and Co., of Leeds, are supplying the fittings and furniture.

The strike in the building trade at Kettering has ended, both parties having accepted the award of Messrs. Gotch and Saunders, architects, of that town, raising the rate of wage for carpenters and bricklayers from 7d. to 7½d. per hour, and that of labourers from 4½d. to 5d.

For the ventilation of the new Free Church, Stonehaven (Mr. John Coutts, Aberdeen, architect), the "Climax" patent direct-acting turret ventilators, ornamental design C, are being used and supplied by Messrs. Cousland and Mackay, ventilating engineers, the sole manufacturers of these ventilators.

The Bolton Town Council have decided to provide a boating-lake for the town at Deane Valley. The lake will have an area of 8½ acres, being 512 yards long and 80 yards wide. The estimated cost is £9,500, with an annual rental for the necessary land of £171.

The memorial stones of a new Calvinistic Methodist Chapel, Llanfwrwg, Ruthin, were laid by Mrs. W. Cornwallis West and others on Thursday in last week. The chapel, which will seat 400 persons, is being erected from designs by Mr. Thomas Parry, Colwyn Bay.

A Local Government inquiry with regard to an application by the Eccles Town Council for power to borrow £20 for carrying out an electric lighting scheme, and £11,348 for other works, was held on Thursday and Friday in last week in the Eccles Town Hall before Mr. G. W. Willcocks, C.E., inspector under the Local Government Board.

At a meeting of the dean and chapter of Bangor, held on Monday, it was resolved to accept Messrs. Hill and Sons' scheme for restoring and improving the cathedral organ, at a cost of some £1,800, and also to redecorate the choir, the work to be proceeded with as soon as the funds are assured.

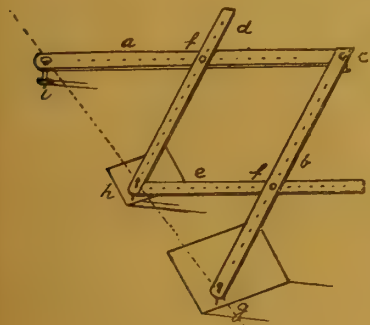
In the arbitration between Mr. W. Lister Mariner, of Keighley, and the Bradford Corporation respecting the amount of compensation to be paid for constructing a sewer through Mr. Mariner's land at Frizinghall, the award has been given for £491 2s. 9d. by Mr. E. S. Clare, the umpire. The amount claimed was £1,292.

The Queen has subscribed £50 to the fund which is being raised for the restoration of the tower of the parish church of St. Austell, Cornwall, a work now in progress.

An organ was used for the first time in St. Anne's Episcopal Church, Dunbar, on Sunday. The organ, which has been built by Messrs. Willis, of London, has cost £500.

The dock extension works at Southampton are proceeding briskly, and every week perceptible advances are made towards completion. One of the quays will be ready for use early in July.

The first of the huge beams which have been waiting in the cathedral yard at Winchester to be utilised by Mr. John Thompson, of Peterborough, in the reconstruction of the nave roof, under Mr. J. B. Colson, the cathedral architect, was, with befitting ceremony, hoisted into position on Tuesday. It is a piece of oak from Stettin, 41ft. in length, 18in. deep, and 14in. across. The lead from the roof is being re-cast by Mr. W. P. Moreton, of Winchester. The opening of the roof has brought to light several points of interest. The most important is that the pitches of the two roofs—first, that of Bishop Walkelin, and afterwards that of Bishop William of Wykeham, who converted the Norman nave into a Perpendicular one—are now plainly discernible. William of Wykeham's roof is some 6ft. higher than that of Walkelin. The point is now settled that the Norman Cathedral did not have, as some had supposed, a flat roof similar to that of St. Alban's.



The Pantograph.

crossing, the two pairs being also jointed together at *e* and *h*. The perforations are made at uniform distances in accordance with the scale of measurement. The pivoted joints by which the two pairs are connected are constant, while the joints between the intersecting limbs of each pair may be shifted by inserting the joint pins, *f, f*, in different holes in each limb. By thus changing the pins the copy may be reproduced in any scale, either larger or smaller than the original, or it may be drawn the same size.

"In use, the end pivot *i* is fixed to the table, the pivot *e* sliding on the plane surface according to the impulse given to it; the pivot *g* carries a tracing point, which is passed over the original lines to be reproduced, and the pivot *h* carries a pencil or point which traces the copy or pricks it into the paper.

"*a, b, d, e*, are rules perforated with a series of holes placed at graduated distances; *a* and *b* are permanently but movably jointed at *e* to a traversing support; *d* and *e* are similarly jointed



## Engineering Notes.

**CENTRAL LONDON RAILWAY.**—After much delay the construction of this important undertaking is about to be commenced. It is a line of about  $6\frac{1}{2}$  miles in length, starting at Shepherd's Bush, and proceeding under Uxbridge-road, Bayswater-road, Oxford-street, High Holborn, Holborn, Holborn Viaduct, Newgate-street, Cheapside, Poultry, and Old Broad-street, terminating at Liverpool-street. It will consist of two separate tunnels throughout its entire length, the stations being 14 in number, and over four-fifths of the total number of claims for properties required have now been settled. The works of construction and equipment have been let to the Electric Traction Co., Limited, and at the half-yearly meeting of that body on Friday, it was stated that the actual operations will be commenced in a few days. The line from Shepherd's-bush to the Bank had, the directors reported, been divided into six sections. Tenders were invited for the shaft and tunnel work of each section separately, and they have given the sub-contracts as follows:—Sections 1, 2, and 3—Shepherd's Bush to the Marble Arch—Mr. J. Price; sections 4 and 5—the Marble Arch to the Post Office—Messrs. Walter Scott and Co.; and sections 6—the Post Office to the Bank—Mr. G. Talbot. In connection with the railway there is to be constructed under the open space in front of the Mansion-house and the Royal Exchange a system of public subways, which will also give access from the public streets to the Bank Station. The sub-contract for this work has been let to Mr. G. Talbot.

**EXETER, TEIGN VALLEY, AND CHAGFORD RAILWAY.**—Considerable progress has been made during the last six months in the construction of this undertaking. Some two miles of line near Lea Cross is practically ready for the establishment of the permanent way. The contractors, Messrs. J. and Dickson, are at present concentrating labour at Perridge, about  $3\frac{1}{2}$  miles from Exeter, and where the heaviest piece of work of the whole route has to be carried out—namely, the formation of a tunnel half a mile long. The line will have a depth of about 70ft. at the commencement and termination of the tunnel, and of about 250ft. at the apex. About 250 men are now at work, but another 200 navvies will soon be put on.

**KEYHAM EXTENSION DOCKS, DEVONPORT.**—The Admiralty authorities have decided to carry out during the next few years an extensive scheme of extension of the basins, docks, and warehouses at Keyham. The extension does not take in any more land from the Manor authorities, but is all within the boundary wall from the Keyham gates to the R.N. Barrack-gates at Camel's Head. At the southern end of the proposed works will be a tidal basin, 720ft. long and 500ft. broad, giving an area of about  $8\frac{1}{2}$  acres. The present north wall of Keyham is to be extended out into the river for a distance of about 50ft., the proposed basin being placed on the east or land side. Three other docks are proposed, one of which is marked as a lock. The dimensions of these locks are to be, two of 700ft. long and one of 725ft. long, the 725ft. dock being the one nearest the land; each of these docks will be able to accommodate two ships over 300ft. in length easily, and will be sufficient for the largest battleship afloat. These three docks, having caissons at each end, can all be used either as docks or locks, providing three entrances to the big basin, two from the tidal basin, and one from the river. The large basin will have an area of  $35\frac{1}{2}$  acres, being 1,550ft. long by 1,000ft. wide, and there will be another dock leading from it, landwards of the other three, 450ft. long. This dock will be fitted with only one caisson, and will have no connection with the tidal basin. The large basin beside the lock entrances may be entered from the sea-front, the caisson for this purpose being situated just inside the end of the present barrack pier. After this caisson, the sea-wall widens outwards until opposite the corner of the basin, where it will be about 350ft. wide, and then it goes from this point to another about 400ft. from the north side of the basin, and runs parallel to this side to the limit of the barrack territory. This large sea-wall at the north end of the basin will be used as a coal depot. The greater part of the docks and basins are outside the present foreshore, on a site now occupied by a bank of mud.

On the land side of the scheme the ground is to be used as workshops, sheds, and stores, including a shed for the use of the Dockyard Reserve on the border of the tidal basin. This shed, besides storerooms, boat-house, &c., will contain a small factory, with separate shops for the different trades, to be used by the naval engine-room artificers, and will replace the *Defence*, the present floating factory.

**NEWMILNS AND DARVEL RAILWAY.**—The extension of the Glasgow and South-Western Railway from Newmilns to Darvel was formally opened last week. The construction of the new line, which is two miles in length, involved the demolition of the Newmilns Public School, and it is carried through the public park of that town by a huge viaduct of 26 arches built with stone, arched with brick, and finished on the top with an iron railing. The contract was carried out by Messrs. Boyd and Forrest, Kilmarnock and Stewarton, under Mr. Merville, the engineer of the Glasgow and South-Western Railway Company.

**OVERHEAD RAILWAY, LIVERPOOL.**—The delegates attending the annual conference of the Amalgamated Society of Engineers, which is at present being held in Liverpool, the principal business being the revision of their rules, visited, on Monday, the Overhead Railway, and the extension to the Dingle that is now in process. The extension begins about 150yds. north of the present terminus at the Herculaneum Dock, and the first portion consists of an iron viaduct, extending for some 250yds., and carrying the line to the entrance of a tunnel. This viaduct, which will include one span of 220ft., is rapidly reaching completion, the ironwork being supplied from the forges at Warrington of Messrs. Pearson and Knowles. The new tunnel is also approaching completion; it is 800yds. in length, and is built for a double line. When the extension is finished, in the course of a few months, there will be direct communication by the overhead line between the Dingle and Seaforth.

**THE INSTITUTION OF CIVIL ENGINEERS.**—At the annual general meeting of this body, the council for the session 1896-97 was duly elected, when several members were placed on the governing body as representative of the profession outside the United Kingdom. The full list of the new council is:—President, Mr. John Wolfe Barry, C.B., F.R.S.; vice-presidents, Mr. W. H. Preece, F.R.S., Sir Douglas Fox, Mr. James Mansergh, and Mr. William Anderson, D.C.L., F.R.S.; other members, Mr. A. R. Binnie, Mr. Henry Deane, Mr. W. R. Galbraith, Mr. George Graham, Mr. J. H. Greathead, Mr. J. C. Hawkshaw, Mr. Charles Hawksley, Mr. John Hopkinson, jun., D.Sc., F.R.S., Mr. A. B. W. Kennedy, LL.D., F.R.S., Mr. John Kennedy, Mr. G. Fosbery Lyster, Sir Guilford L. Molesworth, Sir Andrew Noble, F.R.S., Mr. William Shelford, Mr. B. B. Stoney, LL.D., F.R.S., Mr. F. W. Webb, Sir W. H. White, F.R.S., and Sir E. Leader Williams. Of these gentlemen, Mr. Henry Deane represents Australia, and Mr. John Kennedy, Canada.

**THE SURREY COMMERCIAL DOCKS.**—A visit was made by a large party of the members of the Society of Engineers on Tuesday to the Surrey Commercial Docks, Rotherhithe. The undertaking has been only known by its present name for about thirty years, but is an extension of the Howland Dock constructed before 1660. New works have been added to the estate from year to year, and at the present time the property of the company comprises ten docks and seven timber ponds, with an aggregate water area of 160 acres, and land and wharfage area of 210 acres, making together about 370 acres. The available length of quayside in the docks amounts to five miles, and the docks have four entrances from the River Thames at different points. In order to accommodate large timber steamers a new deep-water entrance-lock is being made, 500ft. in length, with three pairs of gates, 80ft. in width, and a depth of 30ft. on the sill. The Greenland Dock, which was constructed in 1696, being the oldest wet dock in the kingdom, will also be deepened and extended. The works were begun last year, and the cost, if carried out as proposed, will amount to about half a million sterling. The works now under contract are part of the complete scheme, as designed by the late Mr. James Adair McConnochie, and are being carried out by Messrs. S. Pearson and Son, contractors, under the direction of Mr. J. Wolfe Barry, C.B., his resident engineer being Mr. Wm. Bennett, and assistant engineer Mr. W. G.

Wales. They consist of a dock 845ft. by 450ft. with a depth of 31½ft.; this dock will ultimately be connected with the extended Greenland Dock and form one large dock, 2,350ft. in length, having an area of 21 acres. There are also a communication passage to the Canada Dock with one pair of gates, 60ft. in width and 27ft. of water; and a new canal lock, 135ft. by 21ft. 6in. by 11ft. The walls of the dock are being constructed of 8 to 1 Portland cement concrete, with a 6in. facing of 5 to 1 concrete; the lower portion of the wall for 9ft. is of 9 to 1 concrete, and the upper 10ft. of the wall is faced with blue Staffordshire bricks, backed with stocks, and coped with granite 1ft. 6in. thick. The wall has an average height of 43ft., is 20ft. 5in. wide at its base and 8ft. at underside of coping level. The batter of the face is  $\frac{1}{4}$ in. to 1ft. The bottom of the dock will be made watertight with 18in. of puddled clay. Messrs. Sir W. G. Armstrong, Mitchell, and Co. are the contractors for the gates, swing bridges, and hydraulic machinery, and the power for working will be obtained from the Dock Company's present mains.

### CHIPS.

The jubilee of St. David's Roman Catholic Church, Swansea, has just been celebrated by the addition of a lady-chapel, reflooring of the whole building, replacement of the windows by fresh ones, and the refacing of the external stonework, the total cost having been £600.

Interesting ceremonies took place on Friday in connection with the inauguration of several corporation schemes for the improvement of the south-west district of Edinburgh, the expenditure on which amounts to £3,000. The functions embraced the formal opening of the new steel bridge over the canal between Polwarth-crescent and Yeaman-place, of the new subway joining Dalry and Fountainbridge, of the new access between Dalry and Coltbridge, of the new roads depot, together with the laying of the foundation-stone of the new workmen's dwellings at Tynecastle Park. Among those present were the three heads of the departments charged with the various undertakings—Mr. Morham, city superintendent of works; Mr. Cooper, borough engineer; and Mr. Proudfoot, road surveyor.

The great east window of Ripon Cathedral, which has been covered up for some weeks, has just been exposed to view again, showing the alterations and remodelling which it has undergone at the hands of Mr. A. O. Hemming, of London. The remodelling has been carried out as a memorial of the late Dean Fremantle, but the formal dedication will not take place until the Ripon Festival, on August 20.

The form to be taken by the proposed memorial of the late Rev. William Rogers will be the remodelling of the St. Thomas Charterhouse Schools and Institute. The committee appointed to consider the scheme have received a report from Messrs. Purves and Curphey, surveyors, who state that a sum of at least £2,600 will be required to carry out the structural alterations. A further sum of £1,800 is needed for the acquisition of the vacant land adjoining the institution, and the building thereon of a special lecture-room will cost about £800. The building of a physical laboratory and the enlargement of the existing chemical laboratory will cost about £200, so that the total sum required amounts to between £5,000 and £6,000.

The North Wales Wesleyan Synod granted on Friday permission to erect new chapels at Tanyfron, near Wrexham, Rhiwlas, near Bangor, Mollfre, near Abergel, to renovate the Beaumaris Chapel, to build a schoolroom at Peniel, near Tregarth, and to purchase a minister's house at Mold.

M. Santorin, who, with a party of French archaeologists, is conducting excavations in Greece in search of relics of ancient Greek art, has discovered a beautiful statue of Venus, unfortunately without the head. The work, so far as it is preserved, is reported to bear an astonishing resemblance to the Venus of Milo.

The city council of Bristol have received a report from a committee recommending the increase of the salary of Mr. H. Faraday Proctor, electrical engineer, from £260 a year to £400, rising by increments of £25 a year to £500.

The American Society of Civil Engineers, following the example of their brethren at the Institute in Great George-street, Westminster, have resolved to house themselves in a more adequate and commodious structure than their present premises in New York. A new site in West Fifty-Seventh-street in that city has been secured, and the plans of Mr. Cyrus L. W. Edlitz, also of New York, have been selected in competition. The building will be in a plain type of Italian Renaissance, four stories in height, and faced with stone.



## CONTENTS.

The Improvement in Architecture .....	845
Varied Practice .....	845
Dudley Gallery Art Society .....	846
The Timbers of Australasia.—VIII. ....	847
Concert-Halls and Assembly-Rooms.—XIX. ....	848
Notes on Domestic Drainage.—XVIII. ....	849
Cast-Iron in Builder's and Contractor's Work.—XXVI. ....	850
Domestic Architecture in Washington .....	851
Factory Construction and Factory Acts.—III. ....	852
Home Arts and Industries Association Exhibition .....	853
The Institute of Builders' Clerks .....	853
A Drain-Cleaning Trap .....	854
Royal Institute of British Architects .....	854
"Pegamoid" .....	854
The Pantagraph .....	854
Obituary .....	855
Engineering Notes .....	856
Our Illustrations .....	856
Group of Furniture, Royal School of Art Needlework .....	858
Books Received .....	858
The Building News Directory .....	858
Building Intelligence .....	858
Competitions .....	857
Correspondence .....	857
Intercommunication .....	857
Legal .....	857
Legal Intelligence .....	857
Parliamentary Notes .....	857
Water Supply and Sanitary Matters .....	858
Our Office Table .....	858
Meetings for the Ensuing Week .....	858
Trade News .....	858
Tenders .....	852

## ILLUSTRATIONS.

PASSMORE EDWARDS PUBLIC LIBRARY, KINGSLAND ROAD.—  
NEW BANK AT LEEDS FOR MESSRS. WILLIAMS, BROWN,  
AND CO.—DINING ROOM IN PROPOSED HOUSE IN SURREY.  
—INFANTS' SCHOOL, DAGENHAM, ESSEX.—CHURCH OF  
ST. BARNABAS, MORECAMBE.—PROPOSED CHURCH OF  
ST. THOMAS, ST. ANNE'S-ON-THE-SEA.—COMMUNION AND  
CHOIR FURNITURE OF THE PARISH CHURCH OF BEITH,  
N.B.—FURNITURE AT THE ROYAL SCHOOL OF ART  
NEEDLEWORK.

## Our Illustrations.

THE PASSMORE EDWARDS PUBLIC LIBRARY,  
KINGSLAND ROAD, SHOREDITCH.

THIS foundation-stone was laid yesterday, the 11th inst., by Mr. J. Passmore Edwards, the donor, amid much enthusiasm. The Commissioners for Public Libraries and Museums for the parish of St. Leonard, Shoreditch, of which body Mr. Thomas Martindill is the chairman and Mr. W. C. Plant the secretary, arranged the proceedings, which were carried out with the most satisfactory results. The Rev. Septimus Buss, LL.B., vicar of Shoreditch, opened the ceremony, and the Right Hon. Baron Monkswell moved a vote of thanks to the donor, which was acknowledged by Mr. Edwards in suitable terms. The building, when first adapted for the purposes of a public library, was opened by the Duke of Devonshire on May 10, 1893\*, on which occasion we gave an account of the undertaking. The need of more space consequent upon the crowded state of the rooms has necessitated the extension and completion of the buildings. The house occupied by the librarian has, therefore, been pulled down, and the whole of the site thus obtained is being built on, as shown by the view and plans illustrated herewith to-day. These extensions necessarily rendered the rearrangement of the lending department, which will now be located on the ground floor, the new reading-rooms extending on the right-hand of the entrance from the back to front of the building. The boys' room will be well under control, and the entrances to all parts of the library are commanded by the porter's box adjoining the staircase hall. A room for ladies will occupy the space devoted hitherto to the public space of the lending department, and over the front news-room a spacious magazine-room overlooks the Kingsland-road. In the basement retiring-rooms for male and female clerks have been arranged, with additional store space, which was much needed. The cost of this work has been undertaken by Mr. Passmore Edwards, who provided the money for the purchase of the property originally, which amounted to £4,250, and in addition to this unconditional gift made a donation of 1,000 volumes. The façade is in Portland stone. The contractors are Messrs. J. Jarvis and Sons, of Hackney. The steel girder work is by Messrs. Read Bros., of Cadogan Works, Chelsea.

The top glazings are by Messrs. Mellowes, and the casement gearings by Mr. T. Elsley. The architect is Mr. Maurice B. Adams, F.R.I.B.A.

After the ceremony at Kingsland-road, the company proceeded in carriages to Pittfield-street, Hoxton, where Mr. Passmore Edwards laid the foundation-stone of the Passmore Edwards Public Library, about to be erected by the same Commissioners, and towards the cost of which Mr. Edwards has given £2,000. A view of the building was illustrated in our pages for December 13th last. Since then the plan has been modified considerably to meet the requirements of the Commissioners; but the alterations in the elevation have not necessitated a fresh view being made. Mr. H. T. Hare, A.R.I.B.A., is the architect, and Messrs. Dearing and Co., are the builders. The façade to the right of the block belongs to the public baths, with which Messrs. Spalding and Cross are associated as joint architects, their plan having been adopted by the vestry. This latter work is to be a distinct contract. Prof. Jas. Stuart, M.P., proposed, and Mr. H. J. Sawell, J.P., seconded a vote of thanks to Mr. Edwards. A gymnastic display by the local boys' institute concluded the proceedings, and the Hornchurch Cottage Homes Band, and also the band of the Metropolitan Police, attended and played selections of music.

NEW BANK AT LEEDS FOR MESSRS. WILLIAMS,  
BROWN, AND CO.

THIS bank, which is now being erected in Park-row, has an elevation entirely of polished Dalbeattie grey granite, rising the whole height of the ground floor, 29 feet from the pavement, with red Aberdeen shafts to the porch, and bands in the frieze, and bays of the same material. Above the ground floor the walls are cased with buff terracotta with a slight glaze, and Ruabon bricks. The bank, which occupies the whole of the ground and basement floor, has its entrance in Park-row; but there is an entrance for clerks from Russell-street, and one for tenants occupying the upper stories of the building from Greek-street. The interior will be lined with Burmantofts Faience. The same company are also supplying the terracotta for the front. The granite is from Messrs. Neill, of Dalbeattie. Messrs. Armitage and Hodgson have the contract for the constructive work, the ironwork by Messrs. Butler and Co., the plastering by Messrs. J. P. Mountain and Son, the plumbing by Messrs. Braithwaite, the painting by Messrs. F. Jackson and Co., all of Leeds. The clerk of works is Mr. W. Bruce. The architects are Messrs. A. Waterhouse and Son.

DINING ROOM, HOUSE IN SURREY.

In a small house the dining-room almost necessarily becomes to some extent a living-room for the family. The atmosphere of food in such a case becomes unpleasant and insanitary, and much inconvenience is caused by the clearance of the table for meals. In order to avoid these objections, the illustration shows a dining-table placed in a recess fitted with seating. When the dinner is being laid the curtains which screen this recess from the room can be drawn across the opening, the table being laid from the small serving door adjoining the dining-recess, and thus the servant need not pass through the room at all. When ready the curtains are drawn, displaying the table bright with dainty glass and flowers, lighted by a central hanging-lamp or candles, against the dark background of the seats. And so, not only is an interior effect obtained which is far more artistic than the average dining-room, but everything may be worked with that quiet orderliness which may have been felt to be an impossibility under the cramping conditions of a small house. Messrs. Baillie Scott and Morris designed this room to realise these ideas.

INFANTS' SCHOOL, DAGENHAM.

THE illustration shows the school erected last year for the school board at Dagenham, in Essex, to accommodate 270 infants. Externally, the walls are faced with yellow stock bricks, having red brick dressings and blue brick plinth, and the roofs are covered with tiles. The builder was Mr. Thos. Bruty, of Hornchurch, and the architects were Messrs. Wigg Oliver and Hudson, of 7, Bedford-road, W.C., and 80, Leman-street, E., whose design was selected in a limited competition.

PROPOSED CHURCH OF ST. BARNABAS, MORECAMBE.

THIS church is intended to be built on a corner site, near the sea. It consists on plan of a nave of five bays, 72ft. 6in. long, by 24ft. wide, and

north and south aisles same length as nave, and 13ft. and 11ft. wide respectively; chancel 35ft. by 23ft., same height as nave, and divided by a chancel arch. On the north-west side there will be a chapel, 29ft. by 15ft., with separate porch, and on the south a transept, 29ft. by 11ft., a portion of which will contain the organ console and bellows, the organ above being corbelled out into chancel. The vestries will be under the east window, with separate entrance porch. At the west end will be the tower, 20ft. square and 90ft. high, with north and south porches entering through same. The font will be placed in the tower. The roofs will be open timber, plastered, and covered with tiles (except aisles and vestry, which will be leaded). The church is intended to be faced externally and internally with red stone, with bands of white stone, and the dressings of mixed red and white stone. The style adopted is the Late Decorated. The accommodation will be for 650. The architects are Messrs. Austin and Paley, of Lancaster.

PROPOSED CHURCH, ST. ANNE'S-ON-THE-SEA.

THE proposed church of St. Thomas, which is in the Late Decorated style, will have its floor-level raised some feet above the surrounding streets on a terrace, the banks of which will be planted with willows. On plan, the church consists of a nave 23ft. wide and 31ft. to wall-plate of five bays, with W. and S. double porches at the west end; N. and S. aisles 10ft. 6in. wide and 26ft. to wall-plate, a chancel 40ft. long, same width as nave, and same height to wall-plate, 31ft. The roof is continuous, there being no chancel arch, but the division of chancel will be marked by a fine screen of oak. On the north side will be the organ transept, 26ft. by 16ft., with vestries and offices on the east side, and on the south of chancel a morning chapel, 36ft. by 16ft., having a separate entrance-porch, above which is the bell-turret with slated spirelet 70ft. high. The principal features of the design are the lofty aisles and the arcades, which are the same height on both sides of church, and run the full length, thus giving a very dignified appearance to the interior. The font is placed at the west end under the west window. The church will be faced externally with stone, and internally the nave and aisles, &c., with brick, and the chancel with stone. The roofs will be open timber and covered with tiles, except the aisles, which will be leaded. The accommodation will be for 600. The architects are Messrs. Austin and Paley, of Lancaster.

COMMUNION AND CHOIR FURNITURE, PARISH  
CHURCH, BEITH, N.B.

WE give an illustration of furniture recently placed in the above church for the Rev. I. G. Sutherland, M.A. The font, which is in Sicilian marble, with onyx shafts, was presented by the late Wm. Muir, of Mains, and was supplied by Messrs. Galbraith and Winton, Glasgow. The furniture is in dark oak, handsomely carved, and was made in Beith, which is the chief seat of the cabinet and chair-making industry in Scotland. The choir chairs are covered in pigskin, supplied by Messrs. Muir and Son, Beith, who some time ago introduced this material to the furniture trade. The work was designed and carried out under the supervision of Mr. Wm. Osborne, architect.

## CHIPS.

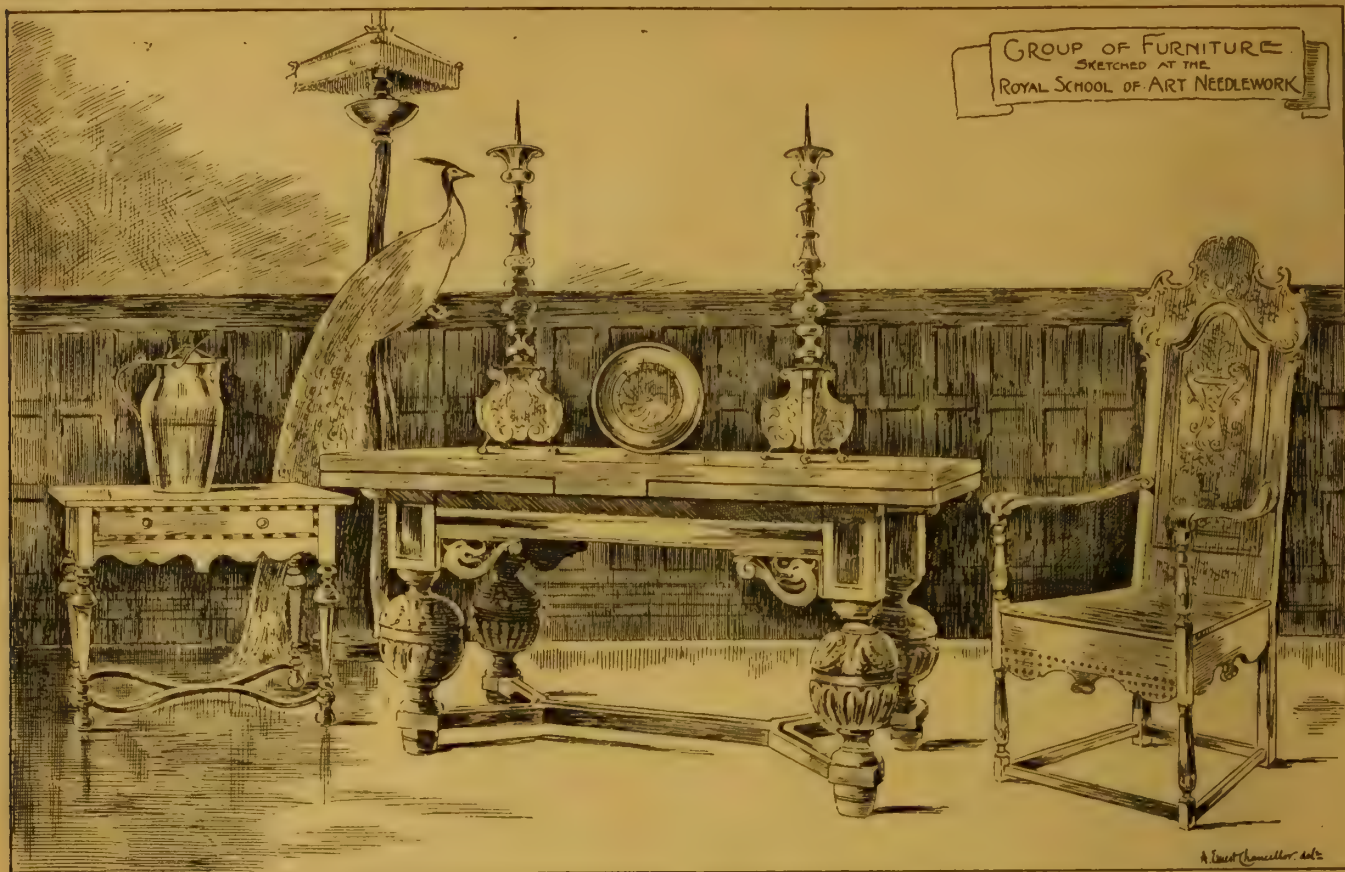
The Bury (Lancs) Town Council have rejected by 18 votes to 17 a proposal to build a new fire-station, including cottages for firemen, at a cost of £10,000.

Rapid progress is being made with arrangements for opening a section of the Lancashire, Derbyshire, and East Coast Railway from Barlborough, near Chesterfield, to Tuxford. Goods and mineral trains will commence running in July, and a portion of the rolling stock has been already delivered at Tuxford, where the line is in connection with the Great Northern Railway, and where a locomotive shed and other buildings have been erected. Barlborough will be, for a time, the terminus of the line at its western end; but rapid progress is being made at Chesterfield, where the company has its headquarters. The eastern extension of the line to Lincoln is not so far advanced, as it awaits the completion of a viaduct over the Trent.

A new Board school in Fair-street, Horselydown, S.E., was formally opened on Monday. The school contains accommodation for 358 boys, 358 girls, and 455 infants. General Moberly, in declaring the school open, said that the building had been erected under great difficulties, and was one of the most expensive schools in the Metropolis; the cost amounted to £35 for each child accommodated.

\* See BUILDING NEWS, May 12, 1893.





#### GROUP OF FURNITURE, ROYAL SCHOOL OF ART NEEDLEWORK.

**T**HE annual summer sale of furniture and bric-a-brac at the above institution, in the Exhibition-road, South Kensington, will be inaugurated on the 25th of this month by its president, H.R.H. Princess Christian.

We herewith give a sketch of a group of furniture from one of the large showrooms, which, under the management of Miss Wade, the secretary, are now filled with all manner of desirable articles in anticipation of the forthcoming sale. The Draw-out Cromwellian Table is undoubtedly one of the most noticeable of the exhibits. To this sturdy piece of work the slender proportions of the Arm-Chair offer a complete contrast. The simple little Table in oak, the two brass Candlesticks from a Flemish church, the peacock Lamp-Stand, and the Dutch Milk-Can further indicate the variety of serviceable objects with which these rooms are now well stocked.

#### BOOKS RECEIVED.

*Lighting, Heating, and Cooking.* A little brochure, a reprint from the *Sanitary Record*, and published by the Sanitary Publishing Company, Limited, Fetter-lane, E.C., contains many useful facts and suggestions on the illumination of buildings, lighting streets, production of heat for cooking and warming. The author deals with each of these subjects, and for general readers the information given will be found useful. The writer shows how light and heat can be made conducive to health and domestic comfort and convenience. He shows the injurious effect of heating buildings, for instance, by hot air conveyed in pipes from a central furnace. The pipes are filled with heated gases from the furnace, and these consist largely of carbonic acid; the heated metal is also detrimental to health, and the air is deprived of its moisture. Hot-water heating by pipes, coils, and radiators is safer, healthier, and cheaper.—*Metallic Structures: Corrosion and Fouling, and their Prevention*, by JOHN NEWMAN, Assoc. M. Inst. C.E., &c. (London: E. and F. N. Spon).—This volume is a practical handbook or "aid book" to assist those who are interested in the design, erection, or maintenance of iron and steel structures, and to draw their attention to points requiring attention in the protection of these structures from corrosion. As the author observes, although it is very seldom acted up to, preservation from corrosion is only

second in importance to the design, as the results of that process, if not prevented, will soon reduce the strength of the structure. Engineers and architects will find much useful information on the preventive and other measures necessary to preserve iron and steel structures. The first part deals with corrosion: its causes, as it affects cast and wrought iron and steel, the corrosive influence of soils, vegetation, situation, rainfall, &c., galvanic action, the influence of scale on those metals, on metal embedded in concrete, brickwork, and masonry, and wood, also piles and columns, pipes and sewers. Speaking of scale or skin of cast iron, the author observes that it is a film of silicate, and is a protection, as it is not readily acted upon by salt water, and, therefore, in submerged cast iron-work the natural skin should be preserved. This silicate scale (fused sand or loam) should be coated with oil or paint soon after casting. Turning and planing the cast iron remove the skin, and open vulnerable places for active corrosion. Wrought iron and steel are different; the skin in their case ought to be removed to prevent corrosion. The skin is not a silicate, but a chemical combination of iron and oxygen. The necessity of covering iron exposed in roofs and bridges with an anti-corrosive and insulating covering, and of keeping them so covered, is urged. A galvanic action is set up when a rolled plate is immersed in sea-water; the oxide scale may become a temporary shield, but the scale gradually flakes off. Any painting should be done after the scale is entirely removed, so that it is desirable to remove the scale before painting them, not to wait till it falls away with the paint. The author gives a useful hint for finding out the condition of submerged piles—viz., by suspending a few short lengths of piles to the permanent structure under water, which can be removed at any time for testing. The chapter on the corrosion of metal in masonry, concrete, and brickwork is full of facts and experiences of interest to architects. The notes on lead and cheap paints, and varnish, tar, and bituminous paints, and the requirements of anti-corrosive coverings are fully considered.—*Engineers' Draughtsmen's Work*, by A PRACTICAL DRAUGHTSMAN (London: Whittaker and Co.), is a little work intended for beginners, young men in schools and workshops who desire to obtain entrance into drawing offices, or to acquire the method used by the draughtsman. A description of instruments, hints for their use, levelling, sketching, shading drawings, designing, mounting drawings and tracings, &c., are matters

treated on in this little guide, and these are well illustrated by diagrams. We can recommend the book to all beginners in engineering offices and shops.—*On Sea and Shore* is an illustrated handbook descriptive of an ocean trip to the Highlands, published by the Aberdeen Steam Navigation Co., of London and Aberdeen.

#### CHIPS.

The Edinburgh Town Council have resolved that the new fever hospital at Colinton Mains should be constructed on the pavilion system one or two stories in height.

At a recent sale at Christie's, Mr. Frith's well-known series of five pictures, "The Race for Wealth," were knocked down for 310 guineas. This amount is less than half the sum paid for a set of sketches of the same in 1882.

The Duches of Albany laid the foundation-stone of a new chapel now being added to St. Anne's Church, Wandsworth, on Saturday afternoon. Mr. Edward W. Mountford, F.R.I.B.A., is the architect, and Messrs. Johnson and Co., of Wandsworth Common, are the builders.

The London and South-Western Railway Company have just let a contract to Messrs. Perry and Co., contractors, of London, for the erection at Southampton of new workshops, stores, and steam laundry for the Union Steamship Company. The new building will practically be an extension of the Company's Engineering Works, and will utilise most of the vacant ground on the west side of the existing buildings. Building operations will be commenced without delay—the site has already been cleared—and will be completed, it is estimated, early in 1897.

Dean Farrar's 13th Centenary Fund for the restoration of Canterbury Cathedral now amounts to £9,310. During last week operations were begun upon the crypt and chapter-house under the personal direction of Sir Arthur W. Blomfield, A.R.A., and the repair of the cloisters will very shortly be undertaken.

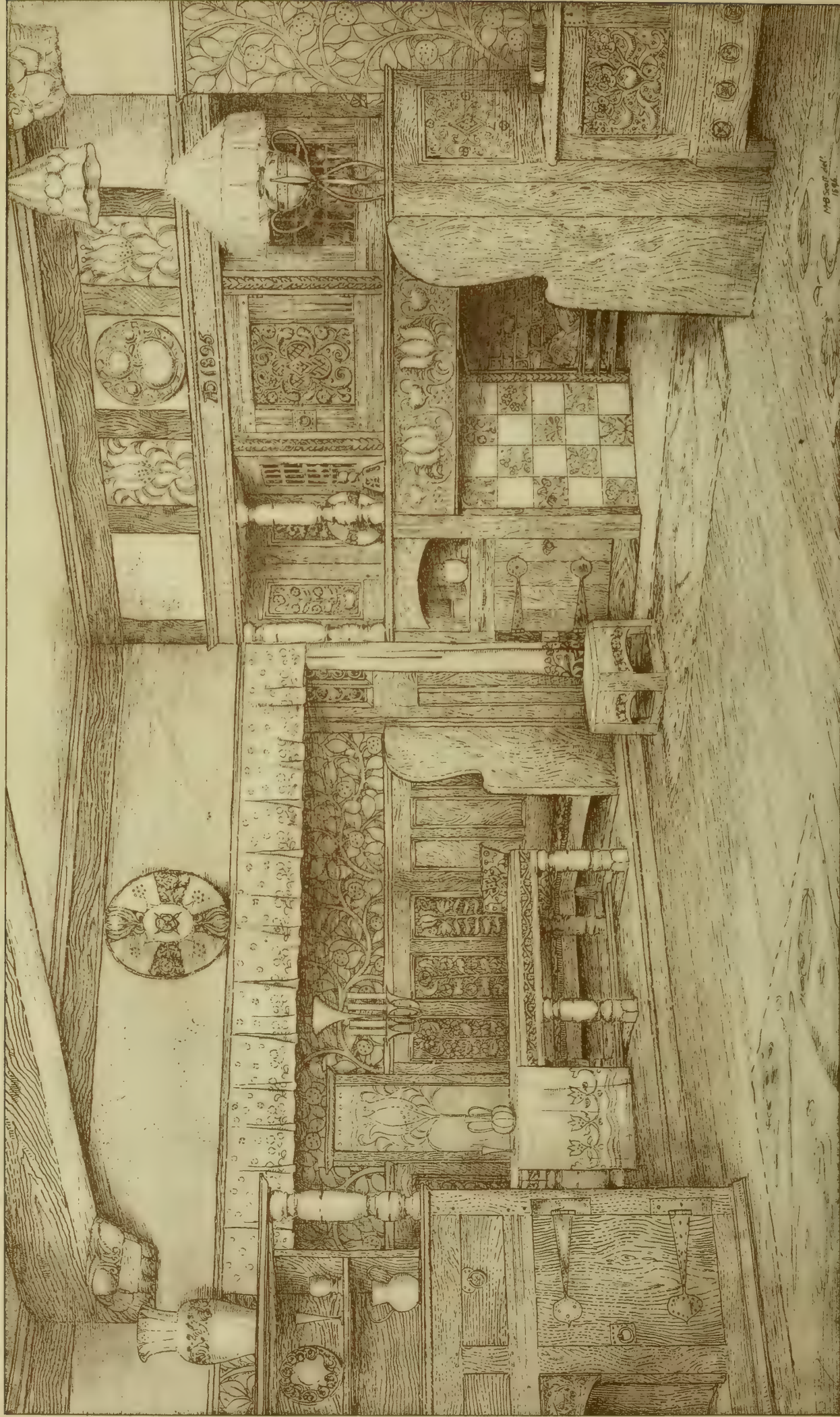
The Whitby Urban District Council have completed arrangements with Sir George Elliot, Bart., for the acquisition of open spaces on the West Cliff, the erection of a shelter, and other important improvements there. Plans for new roads in the same locality have also been passed.

The demolition of 4, Coleman-street, E.C., by workmen in the employ of Messrs. B. Colls and Son (whose premises abut on the site), recently brought to light 17 pieces of pottery of Mediaeval design in a remarkably good state of preservation, ranging in period from the beginning of the 15th to the end of the 17th century.









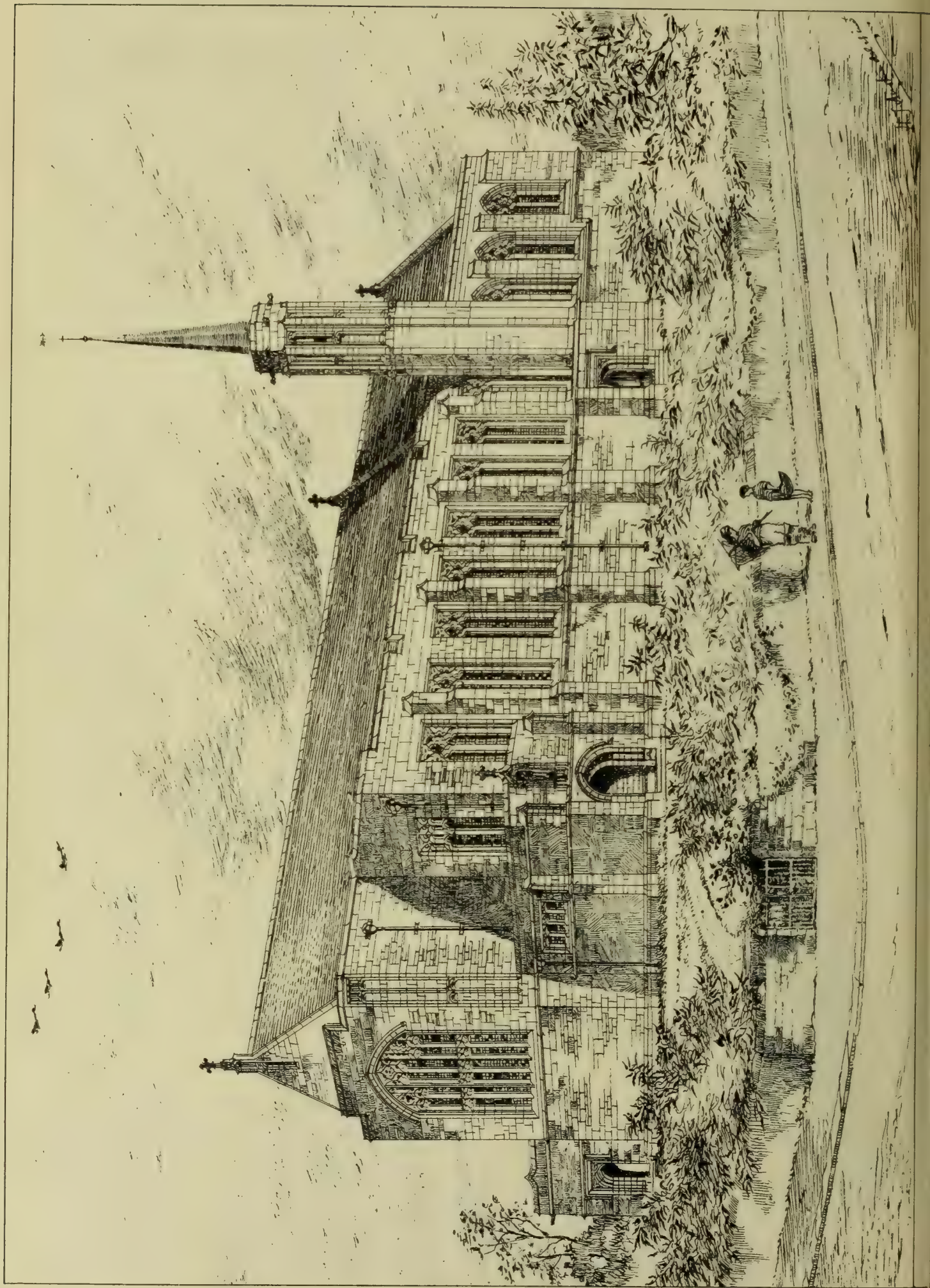
DINING ROOM IN PROPOSED HOUSE IN SURREY. MESSE<sup>RS</sup> BAILLIE SCOTT & SETON MORRIS ARCH<sup>T</sup>S

"PHOTO-TINT" by James Agerman 6 Queen Square London W.C.  
MS Sept 2nd 1896

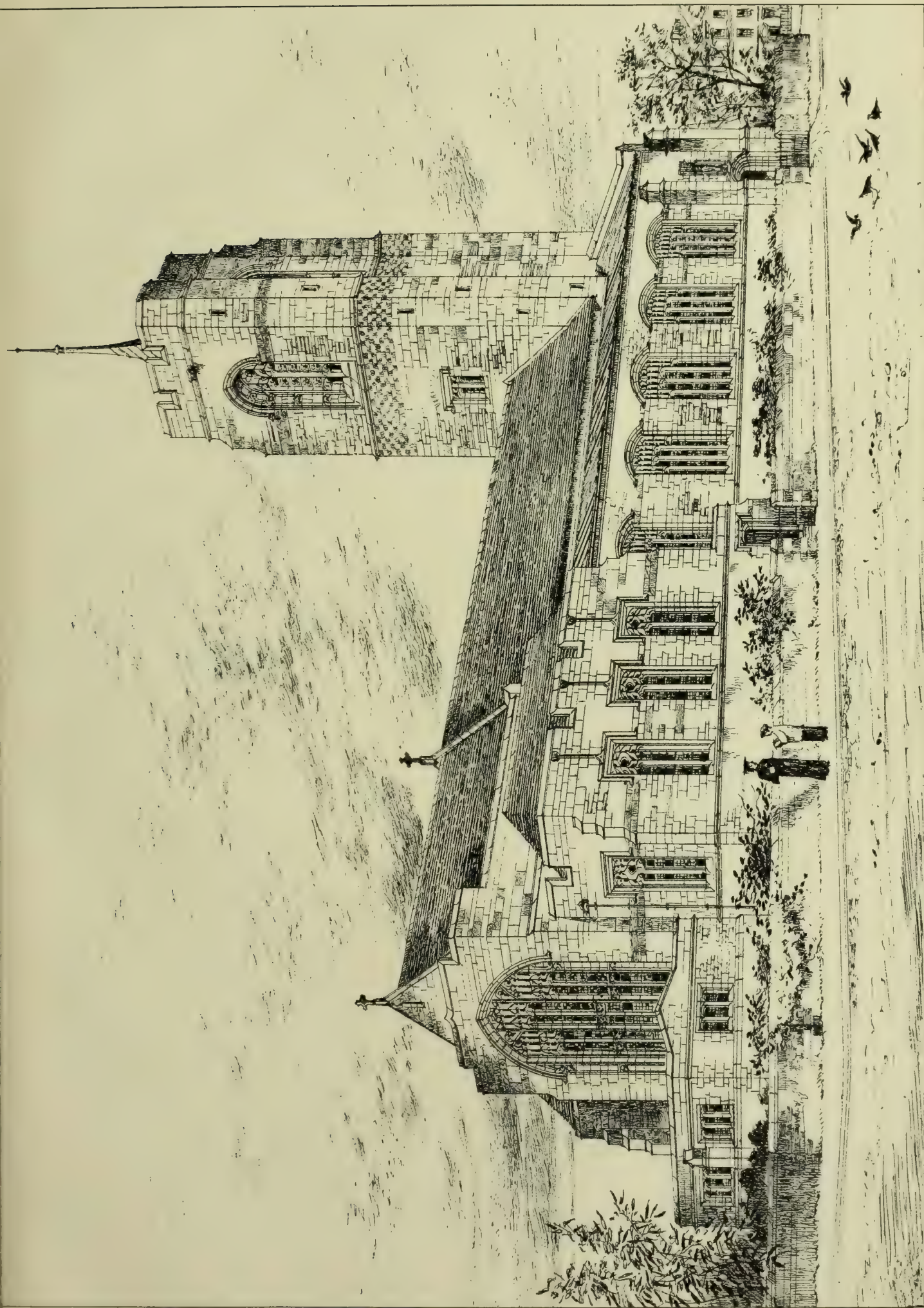












CHURCH OF ST BARNABAS · MORECAMBE · MESS<sup>RS</sup> AUSTIN & PALEY ARCHT<sup>S</sup>

Photo Lithographed & Printed by James Alderman, 6, Queen's Lane, W.

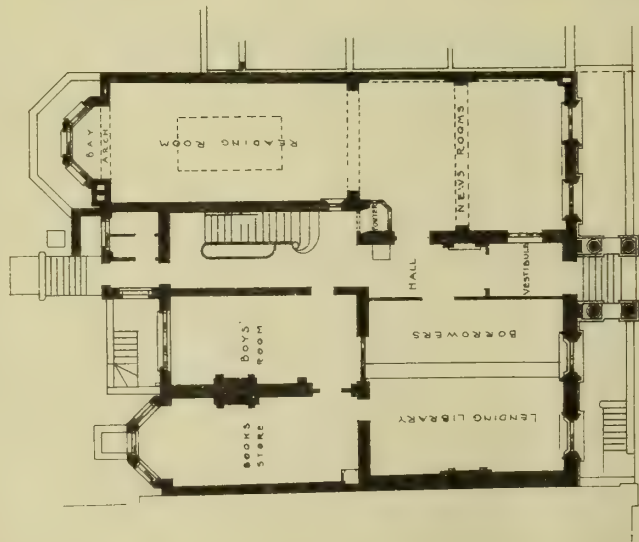




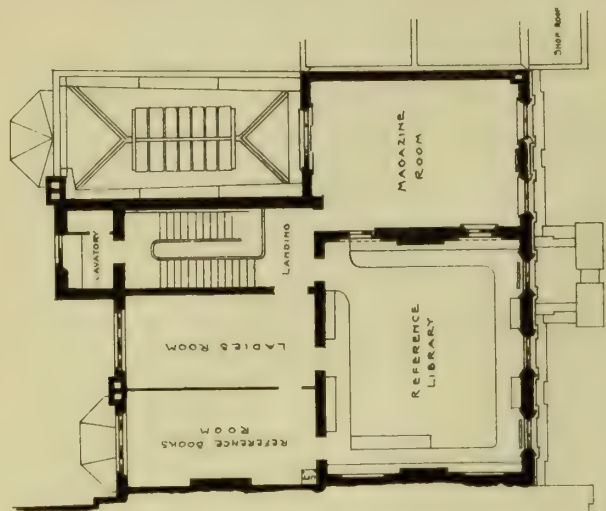




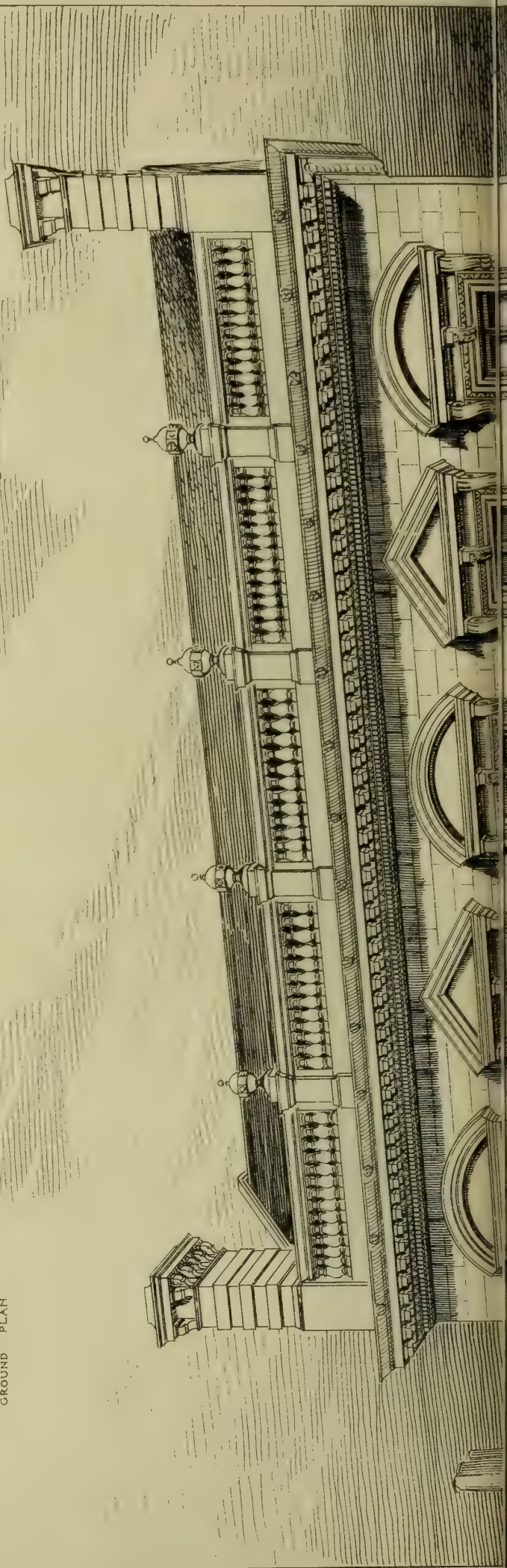




GROUND PLAN



FIRST FLOOR PLAN





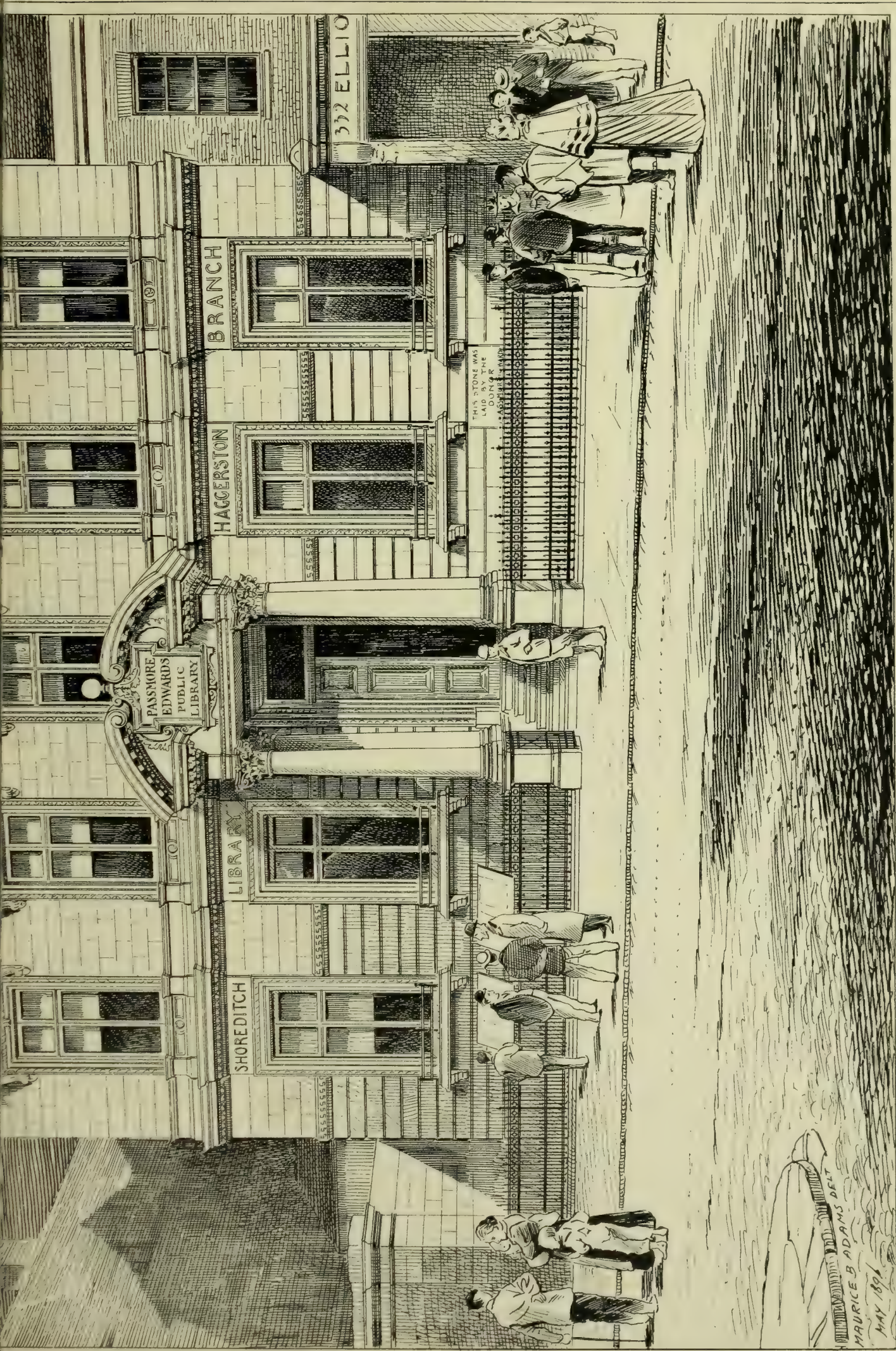


Photo Lithographed & Printed by James Armstrong & Co. Queen's Quay, W.

THE PASSMORE EDWARDS PUBLIC LIBRARY KINGSLAND ROAD SHOREDITCH:  
EXTENSIONS & COMPLETION MAURICE B ADAMS F.R.I.B.A. ARCHITECT

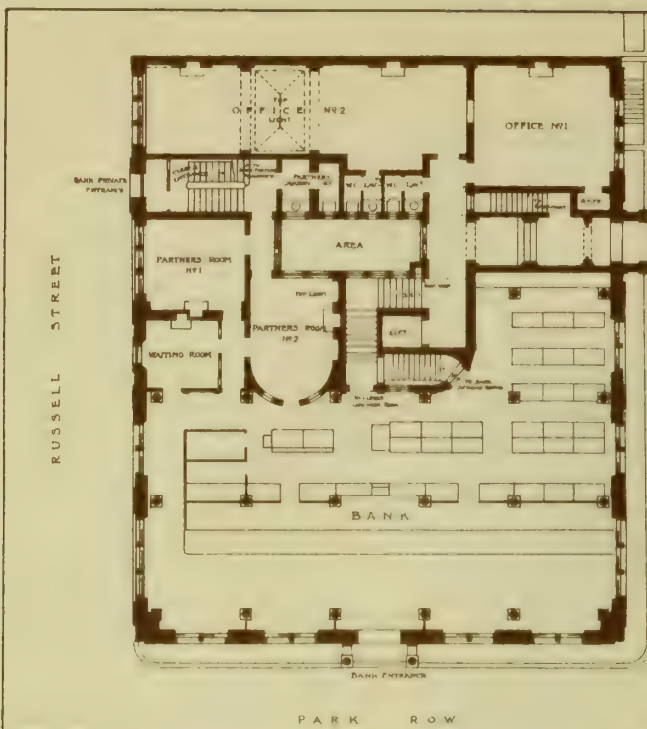








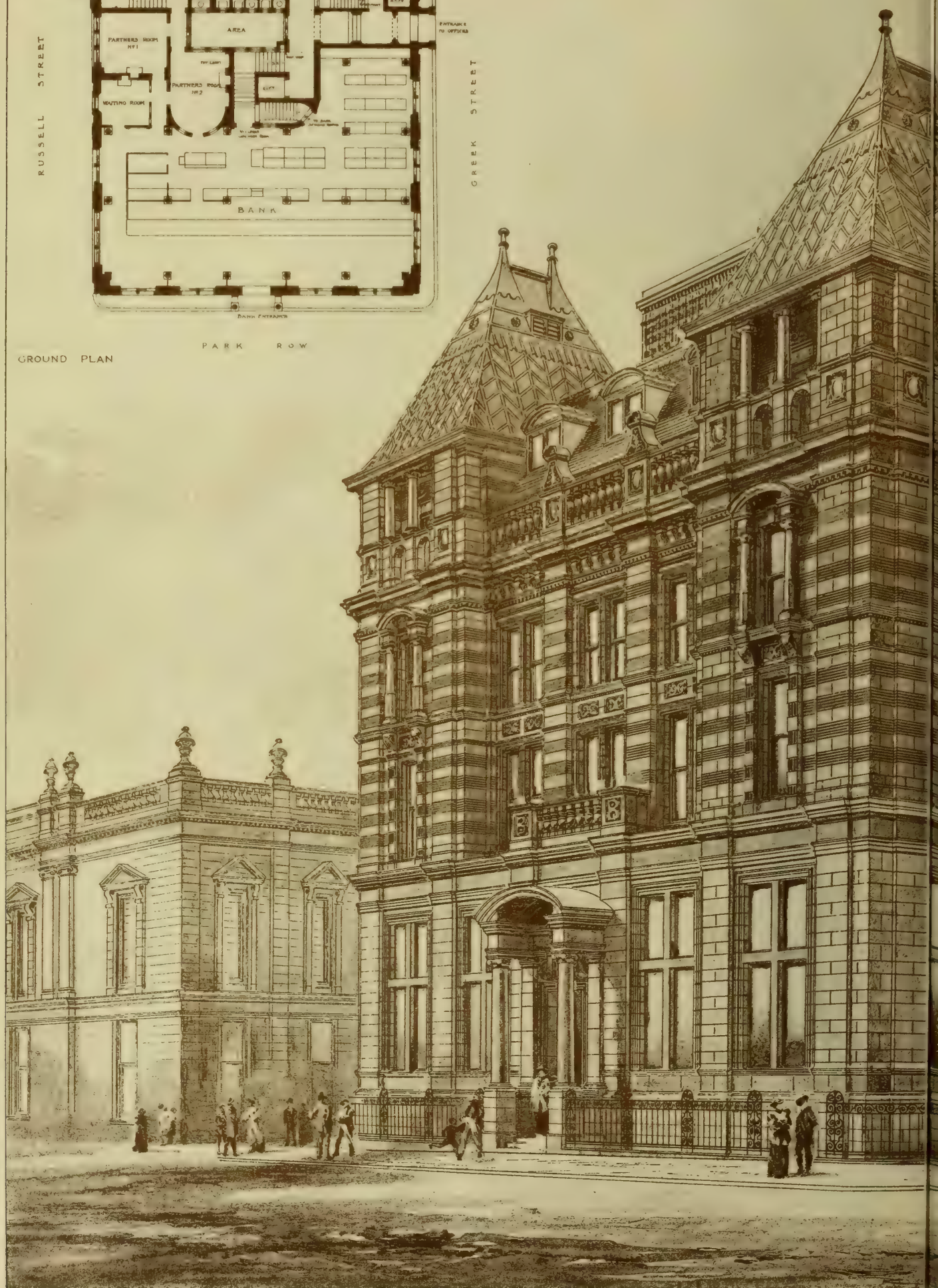




GROUND PLAN

PARK ROW

RUSSELL STREET





JUNE 12, 1896.



MS BROWN 2C2 A WATERHOUSE RA ARCHT

PHOTO-TINT by James Akerman Queen Square London W 1

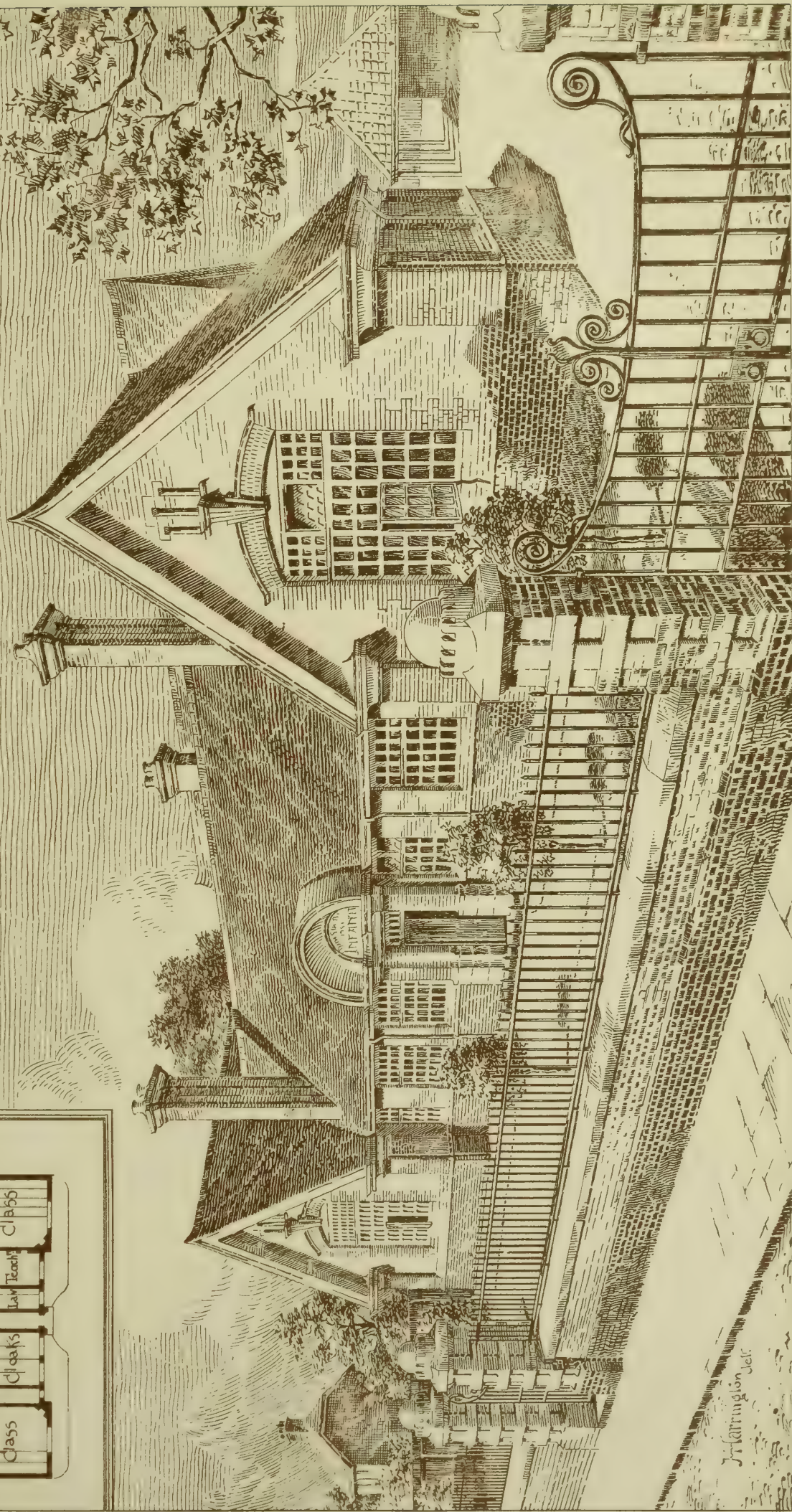
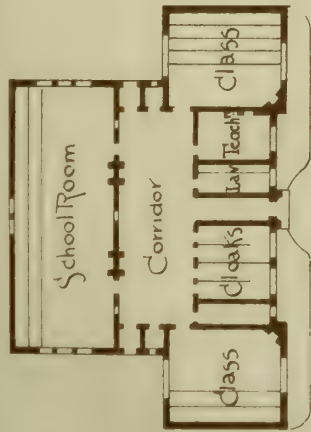






INFANTS' SCHOOL  
ERECTED AT Dagenham Essex  
FOR The School Board  
WIGG OLIVER & HUDSON Architects LONDON

1895

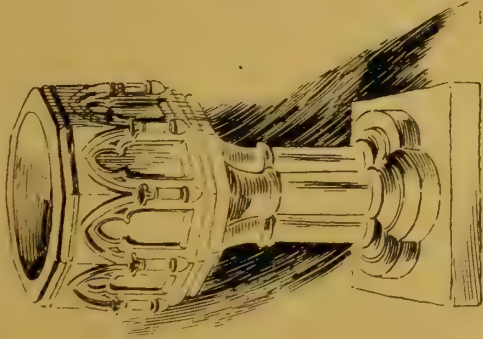






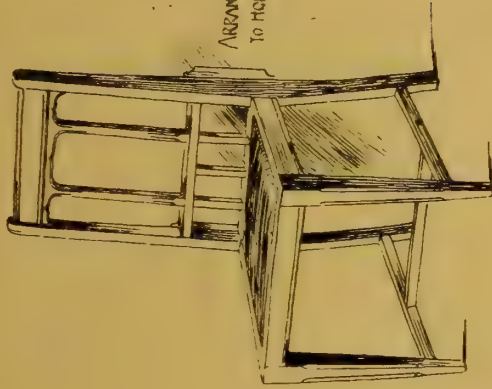


MARBLE FONT



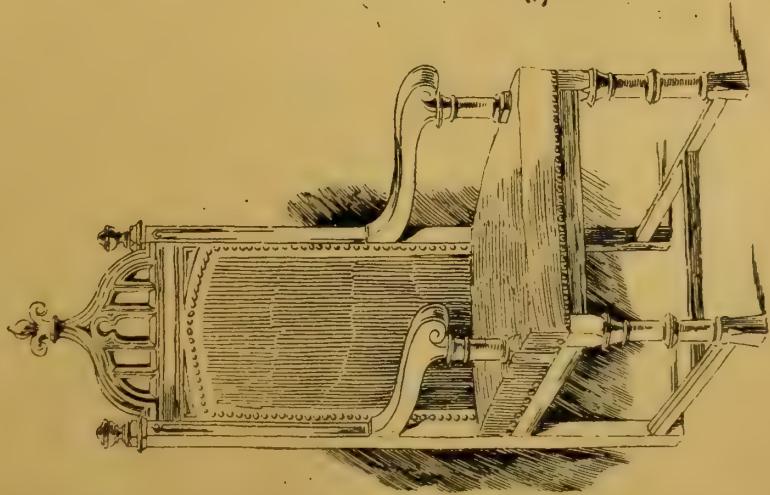
3 feet 3 ins  
to floor

CHOIR CHAIR



ARRANGEMENT AT BACK  
TO HOLD BOOKS

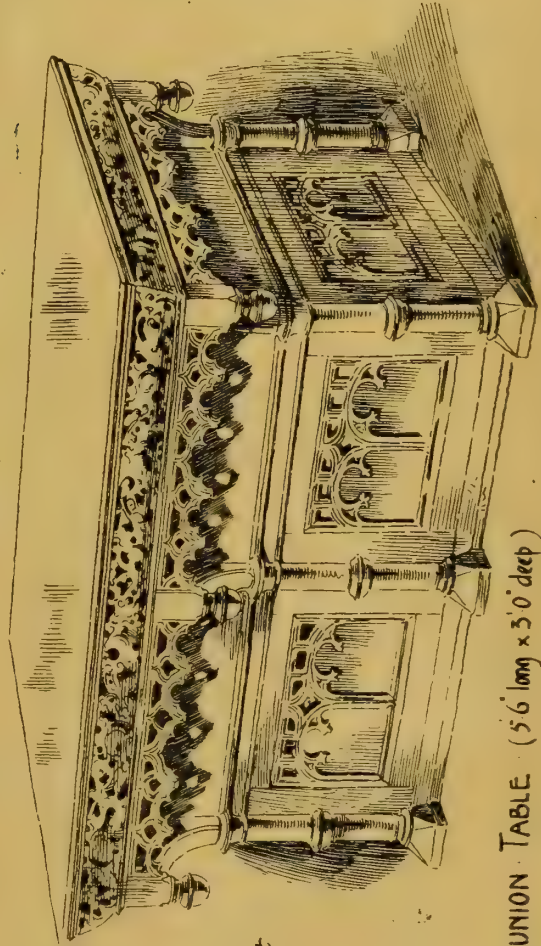
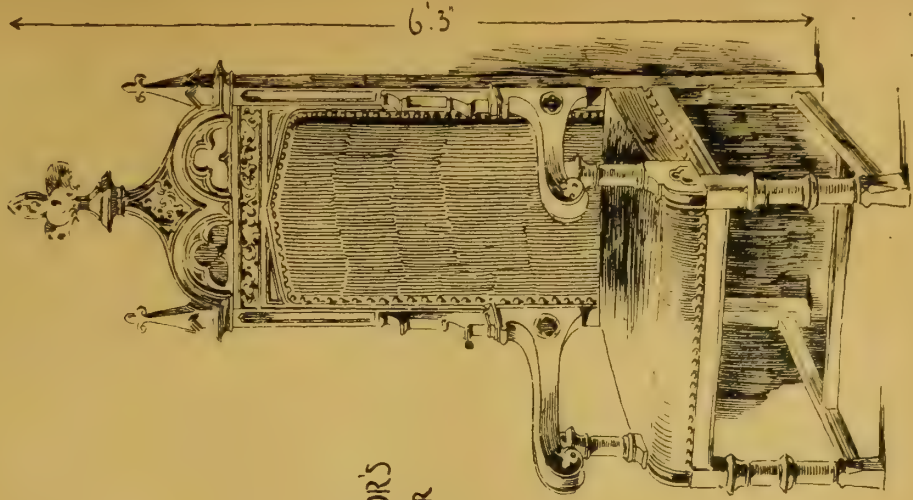
ELDERS' CHAIR



PARISH CHURCH OF BEITH. N.B.  
Communion and Choir Furniture &c

WM OSBORNE BEITH

MODERATOR'S  
CHAIR



3 feet

(COMMUNION TABLE 5'6" long x 3'0" deep)



## Building Intelligence.

**ABERDEEN.**—Operations will soon be commenced for the erection of a new block of business premises in Aberdeen for Messrs. George Mellis and Son, wholesale merchants. Messrs. Ellis and Wilson, architects, have prepared the plans for the new buildings. The main front is 71ft. in length to Guild-street, and the side 109ft. in length to Stirling-street. The block consists of six floors, including the basement. The front part to Guild-street, with a depth of 30ft. is to be devoted to shops and offices, and is of a more ornate description than the remainder of the building, which will form the warehouse. The three shops on the ground floor, with cellars below, will be let.

**BALTON-UNDER-NEEDWOOD.**—Last Wednesday the Bishop of Lichfield visited Barton-under-Needwood, and preached in St. James's Church, on the occasion of the reopening of the edifice after restoration. In the spring of last year the church was damaged by wind and lightning, and it was found necessary to rebuild the whole of the tower parapet. In addition, the mullions of the clerestory windows have been restored, the east end of the church has been repaired, and the ringers' gallery enlarged, the bells being rehung at the same time; new choir-stalls have been introduced into the chancel, and the pulpit has found a better place in the nave. Special gifts, however, have been made by friends—two treble bells to complete the peal of eight, a clock with Cambridge quarter chimes, the west window with stained glass, a new porch at the south-east entrance provided, the contiguous window filled with stained glass, and the chancel arch replaced.

**BOOTHBY PAGNELL.**—Mr. John Thompson, of Peterborough, commenced last week the restoration of Boothby Pagnell Church, which is in a dilapidated state. The cost of the repairs, which will be borne entirely by Mrs. Thorold, of Boothby Hall, will amount to between £5,000 and £6,000. The walls of the chancel, nave, and north aisle are to be raised, new roofs will be placed on the building, the tower pointed, and the pinnacles repaired, whilst a new parapet is to be erected on the nave roof. It is proposed to build a new vestry on the north side, alter and improve several of the windows, renovate the interior, and line it with stone. A new heating apparatus will be provided, new pews put down, and an organ purchased. Mrs. Thorold will also put in a stained-glass window as a memorial to her late husband, Captain Cecil Thorold, J.P. The work is to be completed by December 19th next. The architect is Mr. J. L. Pearson, R.A.

**BRISTOL.**—The opening of the new school at Two Mile Hill took place on June 10. Mr. John Mackay, architect, of Kingswood, prepared plans for the structure, which accommodates 970 children—viz., 300 boys, 300 girls, and 370 infants. Mr. Wiltshire, contractor, has carried out the work under Mr. Mackay. The cost of the site was £935, and the building, including a caretaker's residence, will amount to about £10,500. Another school which the board have in hand is being erected at Greenbank, from the plans of Mr. Bligh Bond, of Bristol.

**CLOPTON.**—The parish church of Clopton, Suffolk, was reopened last week after the completion of the second section of restoration. In 1883 the church underwent partial restoration. A lath-and-plaster ceiling over the nave was removed and some carved oak-work was discovered, and after being repaired where necessary, was again placed in position. The windows were all restored and glazed with cathedral glass on lead lines; an entirely new chancel was built, and in digging the foundations those of the original chancel (which was pulled down early in the century, and superseded by a mean structure) were discovered, and the new chancel was built on them. Later an oak pulpit was erected, and oak pews were substituted for the chairs. The works now completed include new choir stalls, made in oak by Messrs. West and Collier, Oxford, new linen altar cloth, fringed with lace, and some rich old oak carving, which has been made into a super-altar; the vestry has been enlarged and the organ overhauled, and a new bell-chamber is nearly completed. The carpentry work has been carried out by Mr. F. Dowling, Clopton.

**EDGBASTON.**—A new meeting-room has been erected, from plans prepared by Mr. G. T. Hawkes, architect, 45ft. by 22ft., 20ft. high,

classrooms in addition. The roof is carried by pitch-pine trusses springing from stone corbels, and ceiled partly up the rafters and to collar beam with varnished boarding, and there is also a dado round the room 4ft. high. In front of the platform a baptistery, back of platform arched recess, over which is a three-light window. At the rear of this room smaller classrooms and vestries. The building was erected for Mr. Swaine Bourne by Mr. William Beeston. The whole of the windows have been filled in a suitable manner with leaded lights, designed by Mr. Kendrick Swaine Bourne, in antique and other glass, with the introduction of Scripture texts, the whole effect being lofty, light, bright, and cheerful. Externally, walks are asphalted and lined with park fencing, and shrubs will be planted; the walks asphalted by the Val de Travers Company, Limited, Birmingham; the iron gates by Messrs. Bayliss, Jones, and Bayliss, Wolverhampton; the furnishing by Messrs. A. Janes and Son, High Wycombe, Bucks.

**ENNISKILLEN.**—At the meeting of the commissioners on Monday, the engineer (Mr. Elliott) submitted the approved plans of the new town hall. Mr. Cooney said the architect should make no probable estimate. If any member of the board wished to consult him on it, they could do so privately. The engineer agreed with Mr. Cooney's suggestion. If he left the plans before the Local Government Board, and they advanced their grant on them, they would require them to carry out those plans. The contractor might be far above his specification. Mr. Jordan asked a question in reference to the building stones to be used. The engineer said he would use the Lisnaska stone for the back, but he was going to have Mountcharles stone for the front and the windows. Mr. Jordan: Is Mountcharles a better stone than Lisnaska? The engineer: Mountcharles is a whiter stone, a more handsome stone, and I would like to have a contrast. I am not sure we can get Mountcharles stone yet, as I was down there some time ago, and the quarry is in the hands of a man who does not turn out the stone very quickly.

**HALIFAX.**—The building trades in Halifax continue very busy, and the numerous plans for new buildings which have lately come before the improvement committee indicate that a large quantity of property is being erected. Amongst plans recently approved are the following:—Shed, warehouse, &c., at Cromer-street, Fenton Estate, for Mr. John Imbery; stabling in Culver-street, for the Industrial Society; sweet factory in Thompson-street, for Mr. G. W. Wright; stable, coachhouse, and greenhouse, Heath Avenue, Mr. C. F. Horsfall; eight dwellings in Old-lane, for Mr. Joseph Lingard; the new goux department at Stoney Royd; stabling in North Parade, for the executors of the late Mr. Samuel Brook; mill chimney in Commercial-road, for the executors of the late Mr. F. Smith; tower for sprinkler at Box Trees Mills; 14 semi-detached houses at Beechwood-road, for Mr. Thomas Kershaw; five dwellings in Bradshaw-lane, for Messrs. Tetley and Co.

**HOLBECK.**—A special meeting of the Baths Committee of the Leeds City Council was held on Tuesday, Mr. John Carter (the chairman) presiding, to consider the tenders received for the building of public baths by the corporation upon a site previously described in Holbeck-lane. For the masons and bricklayers' work nine offers ranging from £4,000 to £5,114 15s. 7d. had been received. The tender of Mr. J. T. Wright was accepted. For the carpenters and joiners' work there were twelve tenders, varying from £1,160 to £1,330. Messrs. G. Oakes and Sons' (Hunslet) offer was accepted. Twenty firms tendered for the plumbing and glazing, their figures ranging from £126 to £332. The offer of Messrs. W. and C. Barrand, of Leeds, was successful. This firm did the work at the Kirkstall-road Baths. For the engineer's work fourteen firms tendered, their prices running from £759 16s. 3d. to £1,467. A sub-committee was asked to go further into the matter, and accept the tender they think best. Eleven firms competed for the fireproof and concrete work, the lowest offer being £748 16s. and the highest £1,217 14s. 6d. The tender of Mr. J. McFarlane, Leeds, was adopted. For the iron-founder's work eleven tenders ranged from £250 to £387 15s. 9d. For the patent glazing nine offers were to hand, the lowest of which was £69 14s. 6d. and the highest £146 12s. 9d. The sub-committee were asked to deal with the two last-mentioned contracts. The tender of Messrs.

R. Branton and Co., Leeds, for plastering, was selected from a list of eight, the lowest of which was £66 and the highest £81. There were eight tenders for the slaters' work, varying from £265 18s. to £289. Choice fell upon Mr. W. Shovell, of Hunslet. Eighteen firms tendered for painting, the range of their offers being from £75 8s. to £140. The tender of Mr. J. Gaunt, Leeds, was accepted. These baths at Holbeck are to be not only larger, but much more complete, than the baths previously erected by the corporation.

**KIRKLEY, LOWESTOFT.**—At the cost of Mr. E. Kerrison Harvey, many alterations and additions have been made to the interior of Kirkley Church. The organ has been restored and enlarged. A chancel screen of rich design, a Litany desk, and a clock have been placed in the church, and these additions were dedicated on Whit-Sunday. The chancel screen weighs over four tons, and is constructed throughout of wrought iron. It is enriched by gilding, shields being emblazoned on either side of the gateway. The shields on either side of the entrance bear the emblems of SS. Peter and Paul, and those in the centre represent our Lord as the Agnus and the Pelican. Either extremity bear the arms of the diocese and the province of Canterbury. Surmounting these are four angels, bearing respectively the violin, the harp, a music-book, and the ball and cross symbolic of St. Paul. In the centre of these rises up a large cross, supported by further arcaded work. The screen has been manufactured by Messrs. Hart, Son, Peard, and Co., of Drury-lane, the same firm who, instructed by the architect, Sir Arthur W. Blomfield, A.R.A., constructed the baptistery screen in the same church. The Litany disc is of solid brass, with a base of copper and brass. It has been made by Messrs. Benham and Froud, of Chandos, Strand, and is in unison with the style of the rostrum, lectern, and gas pendants previously supplied by the same firm. The case has been manufactured by the makers of the chancel screen. On either extremity of the base are two angels. The works have been made by Messrs. Thwaites and Reed, of Clerkenwell.

**KNOWSLEY.**—The Countess of Derby laid at Knowsley on Friday the foundation-stone of a village hall, which is to be built at the sole cost of Lord Derby, near the parish church and schools. The building will be of grey brick, with a free use of Wootton red-stone dressings, and will be covered with Welsh blue slates. The hall will be 60ft. long and 30ft. wide, with open-timbered roof 33ft. high to the apex. Near each end and on both sides are doors opening into cloak-rooms and lavatories. At the east end there will be a gallery accommodating about 80 persons, reached by means of a stone staircase. At the west end of the hall a stage or platform is arranged; this will be 30ft. wide and 15ft. deep, and behind are dressing-rooms. The plans have been prepared by Mr. Leslie, surveyor of buildings, Knowsley, and the contract for the work, exclusive of the joinery (which will be done in the Knowsley Building Yard), has been let to Mr. James Pilkington, contractor, Rainford. The cost will be about £4,000.

**NEWTON ABBOTT.**—The foundation of the new hospital in East-street was laid on Thursday, the 4th inst. The new hospital will consist of a central three-story block, with a one-story wing on either side. The central block will contain the executive portion of the establishment, the ground floor of which will comprise entrance hall, 10ft. by 20ft., with tile flooring, vestibule, with wood-block flooring, and corridor, 126ft. by 6ft. 6in., by which access will be obtained to the two wings. On the right of the entrance-hall will be a convalescent room, 14ft. by 16ft., and connected with this will be the board-room, 14ft. by 27ft. On the left will be the matron's room and offices. A staircase will lead from the hall to the first floor, where will be bedrooms, store-room, bath-room, and nurses' sitting-room; while on the second floor will be more bedrooms. The walls will be constructed of blue and red limestone, with Bath stone dressings. The corridors and linen closets will be heated by coils and hot-water pipes, and the wards by Manchester stoves. The architect is Mr. S. Segar, and the contractor Mr. H. Mills.

The appointment of surveyor to the Prestwich (Lancashire) Urban District Council has been given to Mr. Thos. Nuttall, civil engineer, 20, Market-street, Bury.



## COMPETITIONS.

**INGHAM INFIRMARY EXTENSION.**—An intimation has been received from Mr. Jas. R. Wheldon, secretary, that the plans of Mr. Henry Grieves, A.R.I.B.A., architect, South Shields, in the competition for extensions to the Ingham Infirmary, have been placed first by the assessor, Mr. Alex. Graham, F.S.A., vice-president of the R.I.B.A., and that second place has been awarded to the plans of Mr. J. J. Dockwray, also of South Shields. The conditions were prepared by Mr. Leeson, of Newcastle.

**LINCOLN.**—The city council received, at their last meeting, a report from the Special Baths Committee, who stated that, after considering the protest made by some of the competing architects who furnished designs for the proposed new public baths, against the award of Mr. Rowland Plumbé, the assessor and arbitrator, they confirmed his award by which the designs of Messrs. Spalding and Cross were accepted. In compliance with the resolution of the council in committee, they had prepared a statement of the capital and annual cost of erecting and maintaining the proposed public baths, with a view of taking a vote of the ratepayers on the question of the adoption or otherwise of baths. The capital cost was estimated at £11,923 for the buildings, and £3,282 for the site of 1,760sq. yds. After considerable discussion it was decided, notwithstanding strong protests by some members, to take a poll of the city on the question of the adoption or rejection of the entire scheme.

**LLANDYSSUL INTERMEDIATE SCHOOL COMPETITION.**—The plans submitted by Mr. J. H. Phillips, M.S.A., St. John's Chambers, Cardiff, have been selected in the above competition, and he has been engaged to carry out the work.

## CHIPS.

Colchester Town Council have accepted the tender of the Electric Construction Co. to supply an electric installation for £10,675. The buildings are estimated at £2,500.

The rural district council of Wirral have elected as building surveyor, at a salary of £120 per annum, Mr. Alfred Hughes, of Birkenhead.

A block of schools is about to be built for the Luton School Board in Dallow-lane and Dunstable-road, in the West Ward district. Mr. J. R. Brown is the architect.

As a result of a conference between representatives of the Edinburgh Parish Council and the Scottish Lunacy Board, it has been agreed that the parish council will be under the necessity of providing a new asylum to accommodate pauper lunatics to the number of 400 or 500. The present asylum at Morningside is able to deal with only about one-third of the number of lunatic paupers chargeable. It is expected that the building connected with this scheme will necessitate an outlay of at least £50,000. The question of a site for the new asylum has still to be considered.

The ancient parish church of Hampreston, Wimbome is to be restored at an estimated cost of about £2,500, towards which subscriptions amounting to £1,500 have been obtained. The building is of 14th century date, though portions of it show evidences of work of the previous century.

The town council of Aberdeen have passed plans for the proposed reconstruction of the sawmills of Messrs. John Fleming and Co., Limited, which were destroyed by fire some time ago. The estimated cost of the new mills is £2,500.

The members of the Hampshire Field Club paid a visit to the Southampton Corporation Waterworks at Otterbourne on Wednesday week, under the leadership of Mr. Whitaker, the president. Mr. Mathews, C.E., the waterworks engineer, received the party, and conducted them through the works. Prior to reaching Otterbourne the party went on to Compton Down to inspect some round tumuli there. The Hampshire Field Club held a second meeting at Broughton and Stockbridge yesterday (Thursday).

On Wednesday week Messrs. Lucas and Aird began the erection of two new warehouses at the Southampton Docks. Both are being built to meet the requirements in the storage of grain and general merchandise, and will be after the pattern of the large warehouse on the quay of the Inner Dock in the same port, behind which the first of the two new buildings is being erected. Its dimensions are 293ft. by 42ft., with five floors and a basement. The other warehouse will also comprise five floors and a basement, and covers an area of 222ft. by 85ft. It will be erected between the Inner and the Outer Docks. Both buildings are to be completed next January.

## Correspondence.

## A CONTEMPLATED BLUNDER.

To the Editor of the BUILDING NEWS.

SIR,—The London County Council is contemplating the perpetration of a blunder, and the combined action of the Press is needed in pronouncing the opinion of London to prevent it.

The blunder is that the L.C.C. has abandoned its intention of forming a new street from Holborn to the Strand, the construction of which it has committed itself to for years past, and proposes to use the money in building a palace for its own aggrandisement and luxury. Before closing its meeting, however, last evening, it postponed the further consideration of the matter for a fortnight.

In the Paper of Reports before the meeting yesterday of the L.C.C., was a report by the establishment committee on a site for a new county hall, in which it is stated that the work carried on by the L.C.C. in its present building has become "a discredit to London." It explains that several houses in Spring-gardens have had to be taken, in which to carry on the work of the Council, and that one house has been taken a quarter of a mile off, and another house half a mile off, and consequently that a new hall is necessary, and so the Council proposes to carry out a great scheme of extending the Mall and erecting a council palace. The cost of acquiring the land is estimated at "£813,000 net," and the cost of the council palace £500,000, thus together, £1,313,000.

Now, Sir, the L.C.C. has for years past admitted that one of the most urgent needs of London is a communication between Holborn and the Strand, which would also open up a communication between North and South London.

I submit, and I challenge legitimate, accurate, intelligent contradiction, that the need of a new palace for the use of the L.C.C. is not to be compared with the need of a communication between Holborn and the Strand.

If the inconvenience caused to the well-paid staff of the L.C.C. is, as the Report states, a "discredit to London," the blockades of central London, through the absence of a communication between the two great Metropolitan Avenues, is so deep a disgrace as to make the L.C.C. contemptible in the eyes of all intelligent persons.

The trivial inconvenience to the staff of the L.C.C. is of no importance compared with the enormous inconvenience and actual loss to all classes of the public through the long-continued and increasing blockades. Holborn and the Strand are chronically blocked at the intercepting junctions, and as well as Bow-street and the streets off it, are often packed like a stable-yard at a provincial inn on a market day.

For years past the L.C.C. has admitted the urgency of a new street between Holborn and the Strand; for years past public meetings have been held, and deputations sent from them to the L.C.C. urging the construction of such a street; for years past almost the entire Press of London has urged the necessity for such a street, for not only visitors to London, but every class, from the labourer and costermonger upwards, suffer untold losses in time and money and most painful inconveniences every working day in the year, and year after year. The congestion in West Central London is positively dangerous to life and limb. The L.C.C. has also spent immense sums of public money in its labours to arrange for a new street, by valuations, by surveys and plans, by Parliamentary and other legal action, by serving statutory notices throughout the district, and by various other expensive ways, yet, forsooth, all this is to go for nothing; the losses of the labouring and commercial and travelling classes are all to be counted as nothing, and to be allowed to continue so that the money may be available to save the staff of the L.C.C. from some inconvenience, and to gratify the ambition of some of the L.C.C. members, too well known for their assertiveness, who desire to have a magnificent palace in which to hear themselves vaunt their partisan and versatile speeches.

As to the L.C.C. having taken offices half a mile from its central office, such a fact only exposes its incapacity of management, and is no reason why a palace should be built for it at an enormous cost to the ratepayers, and at the sacrifice of a most urgently needed improvement.

If the L.C.C. can find £1,313,000 for an object not urgent, it can find that amount for an object which it has admitted year after year, and which

all London has agreed, is imperatively urgent. If it is now objected that the proposed new street will cost two millions sterling, then let us have a street that will only cost £1,313,000, which the L.C.C. seem to think an easy amount to raise.

The people of West Central London, so far as my observation goes, are filled with the utmost surprise and justifiable indignation that the L.C.C. should be so false to its promises, so lost to its own dignity, so utterly indifferent to the galling needs of the labouring, commercial, and other classes, as is evidenced in its present attempt to abandon the carrying out of an improvement more needed than any other of the period, and to contemplate spending the money instead upon a scheme to promote its own importance and self-indulgence.

Having spoken at several public meetings on the subject, I can claim to have ascertained the mind of the public in West Central London, and in the name of the public I invoke your powerful assistance to aid in putting right this contemplated wrong, so that no Council palace shall be built until a new street is constructed between Holborn and the Strand.—I am, &c.,

C. F. DOWSETT.

3, Lincoln's Inn-fields, W.C., June 10.

A special sitting of the Hastings County Bench was held at the Town Hall on Saturday for the purpose of hearing summonses taken out by the Bexhill Urban District Council against a number of persons who objected to the apportionment made for payment by them with respect to the making up of new roads in Bexhill. Mr. Matthew Dodson Graves, surveyor to the Bexhill District Council, gave evidence in support of the summonses, and the orders applied for were made in every case, with costs against the owners.

The new public baths and free library in Wellington-road, Dewsbury, were formally opened on Wednesday week. The two institutes are housed in one building, which, together with the purchase of site, has cost £20,000. It has been erected from designs by, and under the superintendence of, Mr. G. E. T. Lawrence, A.R.I.B.A., of Queen Victoria-street, E.C., and the contracts for building, plumbing, slating, &c., were let to Messrs. E. Chadwick and Sons, of Staincliffe. Mr. W. English, of Leeds, was clerk of the works.

The brilliant opening of the holiday season has had a wonderful effect on the Blackpool Town Council. At the last monthly meeting it was decided to increase the salary of the borough surveyor from £350 to £450, that of the inspector of nuisances from £150 to £170, and that of the town clerk from £500 to £600.

Cornell University, U.S.A., is to have a separate college for the study of architecture. It will follow the same lines as the celebrated Ecole des Beaux Arts, at Paris, and every effort is to be made to bring it up to the standard of the famous French school. The entrance examinations will be more severe than under the previous organisation, and will include some of the sciences which were formerly part of the subsequent architectural course.

The permanent collection of the City Art Gallery of Leeds has just been enriched by the purchase of the following works by living English artists:—"Pilgrims Resting," by Robert W. Allan, R.W.S.; "Deer-stalkers," by Arthur Wardle; "Wild Flowers," by Flora M. Reid; "What are These to Me and You, who Deeply Drink of Wine," by Charles H. Sims; "As Red as a Lobster," by Mrs. H. J. Robertson; "For Primrose Day," by Mrs. Lester Sutcliffe; "In Poverty, Hunger, and Dirt," by Arthur Buntington; "The River Bosham," by A. D. Peppercorn; "Childhood," by John de Costa; "The Azure Mead," by Gilbert Foster, R.B.A.; "The Drums of the 'Fore and Aft,'" by E. Matthew Hale; "Evening," by R. B. Nisbet, R.I.; "Where the Broad Morass its Bosom Heaves to Meet the Setting Sun," by John Finnie; "Arundel Castle, from the Meadows," by John J. Willson; and a bronze head, "St. Agnes," by Alfred Drury.

When the new railway tunnels were being bored underneath the Mound at Edinburgh, notwithstanding all the precautions that were taken, the walls of the National Scottish Gallery were cracked in several places. By arrangement with the Scottish Board of Manufactures the Railway Company are to make good the damage, and to enable the necessary repairs to be commenced the national collection of pictures is at present being transferred to the East Gallery, which has just been vacated by the exhibition of the Royal Scottish Academy. When the transfer is completed, about a fortnight hence, the East Gallery will be open to the public under the usual regulations. The opportunity will be taken by the Board of Manufactures of the West Gallery being under repair to make internal alterations for its improvement.



## Intercommunication.

### QUESTIONS.

[11509.]—**Architect's Charge.**—What would be an architect's legal charge for plans and tracing (and getting same passed), without details or specification, for eight houses costing £200 each = £1,600?—A. D.

[11510.]—**Ganister.**—Can anyone tell me what so-called Ganister stone is, and of what use it is in building or for other purposes, and what would be the most likely book or periodical to get information about its uses and value?—SUBSCRIBER.

### CHIPS.

A brass has recently been erected in St. Margaret's Church, Westminster, to the memory of the late Viscount Eversley, who was for many years Speaker of the House of Commons.

Plans have been prepared by Mr. C. Webb, of Cardiff, for the erection for a private owner of a large concert and assembly hall, approached from Queen-street, in that town.

At Burnham, Somerset, the Masons Arms public house has just been replaced by a temperance house, erected by Mr. James Keates, of Burnham, from designs by Messrs. Clark and Moscrop, of Darlington. The premises over the restaurant have been taken by the Liberal Association for club purposes.

An organ on the Hope-Jones principle is being erected in the choir of Worcester Cathedral. The console case, of oak, and other features have been designed by Sir Arthur Blomfield, A.R.A.; but the existing organ case, the gift of the late Earl Dudley, will be utilised for the main structure.

On Friday, at a meeting of the Colwyn Bay and Conway Joint Water Board, it was decided to lay a 12in. pipe from Sarn Mynech through the Colwyn Bay and Colwyn district.

The Duke of Cambridge opened on Tuesday, at the Bethlehem Hospital, Lambeth-road, a new recreation-hall, which has been built at the rear of the hospital in order to provide means for holding concerts, dances, theatrical entertainments, and the like for the benefit of the inmates. The cost of the hall has been £11,000.

At a meeting of the council of University College, London, last week, Mr. Ernest A. Gardner, late Fellow of Caius College, Cambridge, and formerly Director of the British School at Athens, was appointed Yates Professor of Archaeology.

The Infectious Hospital, Ramsey, has just been ventilated by means of Shorland's patent exhaust roof ventilators and improved inlet panels, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The London County Council resolved on Tuesday to construct a subway under the Thames between Millwall and Greenwich, for foot passengers only.

The marriage took place at St. Pancras Church, on Tuesday, of Mr. Arthur Blomfield Jackson, A.R.I.B.A., of Bedford-row and Tennyson Mansions, Chelsea, son of the Rev. Blomfield Jackson, Vicar of St. Bartholomew's, Moorfields, and Ida Mary, second daughter of Mr. Charles J. Phipps, F.S.A. The ceremony was performed by the Bishop of St. Alban's.

The streets and sewerage committee of the Leeds Corporation had under consideration on Friday an offer from a syndicate who recently purchased a block of property abutting on Wood-street, Briggate, made with a view to substantial improvements being carried out in that thoroughfare. The letter from the owners of the property stated that the portion which, according to a plan prepared by Mr. T. Hewson, the city engineer, required by the corporation to carry out the improvement, was, on the basis of rentals, worth £24,248, but that the syndicate would accept £20,000. A long discussion took place; no decision was arrived at, but a sub-committee was appointed to make inquiries and report.

The foundation-stone of new school buildings in connection with St. Michael's Roman Catholic Church, West Derby-road, Liverpool, was laid by the Right Rev. Dr. Whiteside on Sunday. The present school buildings were erected about 25 years ago, fronting York-street, West Derby-road, and consist of three stories. The additions consist of two new buildings, arranged on either side of the existing staircase. The larger of the two provides, on the first and second floors, double classrooms, each 40ft. by 20ft., divided by sliding glass screens, and on the ground level a large shed for the boys' playground. The classrooms will provide additional accommodation for 80 children in each department. The smaller addition, fronting to York-street, will be of four stories, a basement for coals, hat-room, and a teachers' room, each room 21ft. by 13ft. 6in. The cost, including furniture, will be nearly £1,400. Messrs. Powell, Sinnott, and Powell, of Liverpool, are the architects.

## Legal.

### ABOUT BY-LAWS.

IF a builder considers the local authority is wrong in refusing to pass his plans, or is acting under a by-law which is unreasonable, he must take the proper course of applying to the Court for a mandamus. It is no use for him to fly in the face of the local authorities, and go on with his building in defiance of them and their by-laws. If he does so he will assuredly come to grief, as has often been shown before, and as has lately occurred again in the case of "Cook v. Hainsworth" (*Times*, May 20). This was a case from Leeds, where, in accordance with a local Act, a by-law had been made imposing a penalty for the erection of buildings except after plans had been approved by the corporation. The defendant had deposited plans which were disapproved of, inasmuch as they did not provide a back road in accordance with the Lands Improvement Act, 1893. Notwithstanding this disapproval, the defendant began his building. He was then summoned before the magistrate, when he contended that the by-law was unreasonable, as it gave an absolute power to the corporation to veto the work, whether the by-laws were complied with or not, and further, that it was *ultra vires*, as not being authorised by any statute. The magistrate convicted, and now this was an appeal.

The corporation took up the ground that as they had given their reason for disapproving of the plans, the magistrate was not the judge to determine the matter. They did not argue that they could, without giving any reasons, disapprove of the plans, and thus their decision, whether right or wrong, was binding. Had they done this, the Lord Justice said there might have been a good deal to say as to the unreasonableness of a by-law which gave such an absolute and uncontrolled power. On the other hand, the parties were not really bound by this by-law, or by the decision of the corporation if they raised the question properly. Their remedy was by mandamus, to order the corporation to accept the plans, when the validity of the by-law would be gone into. But upon an appeal from the magistrate's decision, the Court could not hold the by-law to be unreasonable, and so the appeal was dismissed.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

**NOTE.**—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

E. H.—**SHOP.—BUILDING LINE.**—You cannot go beyond the main wall of house, which, I presume, has been made the certified building line. The showcase, &c., must comply with the by-laws.

INQUIRY.—**PLANS.—BY-LAWS.—PROFIT.**—I do not think the passing of the plans would be so conclusive as to prevent surveyor from objecting that the by-laws have not been complied with. As to the other point, the contractor does not appear to have a legal claim to this percentage.

A new town hall is being built for the borough of Pollokshaws, near Glasgow, at the sole cost of Sir John Stirling Maxwell, Bart. The site is at the corner of Bengal-street and Burnhead-road. Dr. R. Rowand Anderson, of Edinburgh, is the architect. The style adopted is Scottish Baronial, a fabric of the chief elevation being a square tower without buttresses, rising above the level of the main gable. This tower, which contains a clock, is finished by a deep cornice and stepped parapet. The large hall, with gallery, will accommodate about 800 people; and there will be ante-rooms, and a house for the caretaker. Mr. John Baird, 261, West George-street, Glasgow, is measurer; and Mr. Winton is the clerk of the works.

The Barry District Council adopted *nem. con.* on Friday, a proposition that it is desirable to proceed at once with the erection of public offices, public hall, and free library for the town, land for which has already been acquired at Wyndham-street, Barry Dock, near the centre of the district. The Public Works Committee were instructed to consider the necessary preliminaries and submit them for the approval of the council.

The Burns Statue Committee for Paisley have selected a site in the Fountain Gardens midway between the main entrance and the fountain, and the family of the late Mr. Thomas Coats (who gifted the place) have expressed their approval of the proposal. The site was formally approved by the Paisley town council on Tuesday.

### LEGAL INTELLIGENCE.

**ARBITRATION CASE AT BOURNEMOUTH.**—On Wednesday week the arbitration proceedings with regard to the recent extension of the Bournemouth Pier by Messrs. Murdoch and Cameron, engineers, of Glasgow, began in the Council Chamber, Bournemouth, before Mr. Edward Ridley, Q.C., Official Referee of the High Court. Mr. Lowenthal, in opening the case for the contractors, said that the claim was brought for several sums of money due to the contractors on account of work on the extension of the Bournemouth Pier. The contractors now claimed various sums of money—(1) £1,257, the balance of the contract price certified for by the engineer; (2) £364 10s. for the difference in cost of placing and driving 90 piles used in the work, instead of the 83 piles estimated in the specification, and in this case the referee had power to rectify the contract; (3) £202 10s. for 105 tons of cast iron, and 150ft. of greenheart pine, an amount which was claimed under a provisional clause in the contract, but which the contractors did not wish to press; (4) the sum of £1,360, which was due to the contractors on the 15th of May, on the certificate of the surveyor of the work, being at the rate of 80 per cent. of the cost of the work done. This last claim was practically for breach of contract. There was a counter-claim by the corporation, but this was practically a plea that the work had not been properly carried out. On Thursday the proceedings opened with a statement by Mr. Foote on behalf of the corporation, who stated that the counter-claim was made up of plant, tools, piles, surveyor's fees, and all expenses incurred for completing the pier after the contractors stopped the work on the corporation refusing to pay the 80 per cent. cost of the instalment for the work certified by the surveyor. The total amount of the counter-claim was £3,647. Mr. F. W. Lacey, borough surveyor of Bournemouth, gave evidence on behalf of the counter-claim. The Referee remarked that the effect of his evidence was to show that No. 1 plan supplied to the contractors was not a plan that could be worked from, which was a point in favour of Messrs. Murdoch and Cameron. The arbitration is proceeding.

**RE CHARLES JAMES EDMUNDS.**—At Southampton Bankruptcy Court, this debtor, described as a builder, lately residing at Firgrove-road, Freemantle, and formerly of Poplar, London, has been examined. The deficiency was set down at £77 13s. 7d., the fully secured creditors standing at £1,800, and the value of securities at £2,568 2s. The cause of failure was attributed to want of capital, and consequent inability to complete five houses in Shirley-road. The debtor passed his examination.

**THE AUCTIONEERS' INSTITUTES.**—In the Queen's Bench Division, before Mr. Baron Pollock, the case "The Auctioneers' Institute of the United Kingdom v. the Institute of Auctioneers and Valuers" came on. This was an action without pleadings, in which the plaintiffs sought to restrain the defendants from using the title "The Institute of Auctioneers and Valuers," on the ground that it so closely resembled the plaintiffs' title that it was calculated to mislead the public. It appeared that the plaintiff institute was founded in 1886 and incorporated in 1889. The defendant institute was formed and incorporated in 1895. The plaintiffs' office was at 57 and 58, Chancery-lane, London. The first circular issued by the defendants was dated from 61 and 62, Chancery-lane, London, but the defendants had now removed their registered office to Manchester. The plaintiffs sought an injunction to restrain the defendants from carrying on business in their registered name, on the ground that persons wishing to join the plaintiffs' institute would be and had been induced to join the defendants' institute in mistake for the plaintiffs'. Mr. Baron Pollock suggested a conference between counsel, and it was announced that the defendant society would use in future the name of the "International Society of Auctioneers and Valuers," that certain imputations on the defendants should be withdrawn, and that each of the parties would bear their own costs.

**LONDON BUILDING ACT APPEAL.**—At the Guildhall Police Court on Tuesday, Mr. Edmund Woodthorpe, district surveyor for the northern division of the City of London, was summoned before Mr. Alderman Newton at the instance of Mr. George Fraenkel, appealing against his order to make certain alterations. Mr. Vickory appeared for Mr. Fraenkel, tenant of the premises in question—Nos. 58, 59, and 60, Houndsditch. He contended that Mr. Woodthorpe had interfered unnecessarily. Mr. H. H. Collins, district surveyor for the eastern division of the City, called on behalf of the appellant, stated that he had had 40 years' experience. He produced plans showing the alterations Mr. Fraenkel had had made. There was a new staircase put nearer the entrance, giving access to the street, also a door leading from the warehouse to the staircase. The building was practically as it had been to his knowledge for the last 30 years. To do what Mr. Woodthorpe required would mean complete rebuilding at enormous expense. If he understood correctly, Mr. Woodthorpe contended



that by putting in this new staircase practically it made three buildings. With that view he did not agree. Mr. Woodthorpe: I never said anything of the kind. Mr. Chaplain, district surveyor of Greenwich, agreed with Mr. Collins. Other evidence having been given, Mr. Berry, who appeared for the London County Council, said the alterations made enabled the building to be let out to various tenants, and that brought the case within the meaning of the Act. The alderman pointed out that the staircase made escape easier in case of fire. Had the consent of the London County Council been applied for? Mr. Berry: No; and that is why we are here to enforce sections 207 and 74 of the Building Act. Mr. Vickery said his client was advised that the Council's consent was not necessary. Nothing of an external nature had been done, neither had the party-walls been touched. The Alderman came to the conclusion that this was a building intended to be tenanted by different persons. He arrived at this decision with considerable reluctance, his sympathies being entirely with the appellant. The Act was one of a sweeping character, and full of technicalities. He thought the license of the Council should be given. The case was dismissed.

**ACTION BETWEEN ARCHITECTS.**—*SCOTT V. CARRUTHERS.*—Judgment was pronounced, on Friday, by Lord Kincairney, in the Scottish Court of Session, in an action by Andrew Robb Scott, architect, 19, Bruntsfield-place, Edinburgh, against Frank J. C. Carruthers, surveyor and architect, Dumfries and Lockerbie, for £150, said to be due for architectural work executed by the defender in the erection of a board school at Dumfries. The pursuer said he made the designs and plans of the buildings for the defender, and averred that it was agreed that should the design be successful, and the work obtained, the defender was along with the pursuer to carry through the work. The design was successful, and the architectural work intrusted to the defender. The defender maintained that he employed the pursuer as an experienced draughtsman to do work which was purely mechanical—viz., to fill in a front elevation and prepare a perspective—and which required no inventive skill whatever. To avoid litigation, the defender made a tender of £50. Lord Kincairney said the pursuer had failed to instruct an agreement with the defender for the remuneration by a percentage on the cost of the building in respect of certain plans executed for the defender, and found that the pursuer had failed to prove that he was entitled to a sum exceeding £50. Decree for that amount was pronounced, and, in respect that the sum did not exceed the tender, the defender was awarded expenses.

**PAVING APPORTIONMENTS AND PUBLIC PARKS.**—At the South-Western Police Court on Saturday, Alfred Heaver, a builder, owning property in Elmbourne-road, Tooting Bec-common, was summoned by the Wandsworth District Board of Works for £1,067 18s. 9d., the cost of paving the road. For the defendant it was urged that the cost should be apportioned between himself and the London County Council, as the owners of Tooting Bec-common, which is on one side of the road; but the magistrate decided against this contention, and made an order against the defendant for the payment of the whole amount.

**COSTS IN NUISANCE ABATEMENTS.**—*HAMNERSMITH VESTRY V. LOWENFELD.*—In the Queen's Bench Division on Monday, before Mr. Justice Cave and Mr. Justice Wills, judgment was given in an appeal by the plaintiffs, the vestry, from a decision of the judge of the Brompton County Court in favour of the defendant. The point of law was whether an action would be in the County Court to recover costs and expenses incurred before a magistrate in proceedings to obtain a nuisance order under section 11 of the Public Health (London) Act, 1891, before the magistrate had assessed such costs and expenses, and, further, whether such action could be brought after six months from the time when such costs and expenses had been incurred. The Court held that the action could be brought in the County Court until the magistrate had assessed the costs and expenses; and, further, upon the authority of "The Tottenham Local Board v. Rowell" that action must be brought within the six months limited by the Summary Jurisdiction Act, 1848, section 11. Appeal dismissed.

**LEGALITY OF ROOD-SCREEN FIGURES.**—At a sitting of the Consistory Court of the Diocese of Norwich, held last week, Mr. F. C. Blofeld, Chancellor of the diocese, delivered judgment in the Barsham faculty case, which was reported in our issue of the 15th ult., p. 731. The Chancellor said that this was a petition by the rector and churchwardens of Barsham for a citation to issue calling upon the parishioners and others concerned to show cause why a faculty should not be granted to confirm the hanging of bells in the tower, and the erection of a figure of Our Lord on the Cross upon the centre of the chancel screen of the parish church of Barsham, with the figures of the Virgin Mary on one side of it and of St. John on the other. In

"Hughes v. Edwards," in the Court of Arches, and in two cases in Consistory Courts—viz., the St. Lawrence, Pittington case, and the St. John, Pendlebury case—a distinction was drawn between isolated figures and historical groups, and it was pointed out that the latter might be lawful where the former, as more likely to be abused, would not be so. In the present case the figures in question constituted a group commemorating a well-known scene in sacred history—viz., our Saviour on the Cross commending His mother to the care of the Disciple whom He loved; and there was no attempt to reproduce the rood or rood-loft with its candles and worship. He could not hold that these figures, simply placed as they were upon the chancel screen, were of themselves so likely to become objects of superstitious reverence in the present day as to call upon him to refuse to allow a citation to issue. No question arose as to the bells. The citation, therefore, might issue as prayed.

**TITHE AND BUILDING PLOTS.**—*F. J. ASHALL V. EZEKIEL BEATON.*—In this case the Rev. F. J. Ashmall, late vicar of Holy Trinity, Southampton, sued Ezekiel Beaton, builder, of Bevois Town, for £11 4s. 3d., tithe rent charge. Mr. Wharton was for plaintiff, and Mr. Winstanley for defendant. The solicitors had drafted a statement of facts upon which they were agreed, and it was understood that the principal point at issue was whether, the tithe having been redeemed, the tithe owner could recover arrears which might have fallen due prior to the actual redemption. Mr. Wharton stated that the point was an important one, and of interest to many tithe-owners. Mr. Winstanley mentioned that the amount in dispute was in respect to an unapportioned tithe, payable by thirty or forty owners of an estate cut up into building plots. The owners were called upon to pay a considerable capital sum for the redemption of the tithe, and when they received the receipt they naturally thought that they had discharged all their liabilities in respect to the tithe. He submitted that if any arrears were claimed, they should have been claimed at the same time as the capital, and that the owners were discharged from all liability on payment of the capital. In their application for payment of the capital sum the Commissioners clearly stated that such payment would make the land tithe free. He contended that when a certificate of redemption was granted, all tithe, past, present, and future, was at an end. The case was argued at length by the respective solicitors, and his Honour said he should take a little time to consider his decision.

**WHO IS RESPONSIBLE?**—At Marlborough-street Police Court, on Wednesday, Mr. Frank Kirk, a contractor, of 19, Abingdon-street, Westminster, was summoned before Mr. Hannay, by Thomas Strutt, sanitary inspector to the Strand Board of Works, for permitting an accumulation of stagnant water and offensive vegetable and animal matter to remain on a plot of ground bounded by Little Newport-street, Earl's-court, Cranbourne-street, and Ryder's-court, and thereby causing a nuisance. Mr. Strutt said that upon the piece of ground in question was a trench, 81ft. long by 12ft. wide and 24ft. deep, in which was stagnant water 9ft. deep, containing a quantity of vegetable refuse and dead cats and other animals. At times very offensive smells emanated from the trench. He had always understood Mr. Kirk to be the owner. The defence was that the defendant was not the responsible party, having simply in 1891 obtained from Lord Salisbury, the owner of the property, a license to carry out certain building work upon the land. The license had since been revoked, and Mr. Kirk was now unable to proceed with the work. Mr. Kirk, after being upon the lands so many years, having pulled down old tenements which were a scandal, and having paid large sums of money to Lord Salisbury for rent, now felt aggrieved at being compelled to leave the property. In fact an action was now pending, in which he claimed £15,000. Dr. F. J. Allan, medical officer of health to the Strand District Board of Works, said that Lord Salisbury's solicitors had been communicated with, and they stated that Mr. Kirk was the responsible party. Mr. Hannay adjourned the hearing of the summons for inquiries to be made as to who was really responsible, and directed Mr. Kirk to produce the cancellation of his license with respect to the property.

The Wesleyan church at Melton Mowbray has acquired a site on which it is proposed to erect a lecture-hall, a church parlour, and a number of classrooms, at a cost of £2,000.

Whilst some workmen were employed in alterations to Trevor Hall, Llangollen, the residence of the late Mr. J. C. Edwards, terracotta manufacturer, of Ruabon, they were surprised by finding in the roof 160 £5 bank of England notes and a bank-book containing deposits amounting to £1,200. The notes and bank-book, which have been in the roof for 72 years, have been handed over to Mr. E. Lloyd Edwards, the present co-partner of the firm trading as J. C. Edwards, Ruabon. The matter is being inquired into to trace the owner.

## PARLIAMENTARY NOTES.

**SOUTH KENSINGTON MUSEUM COMPLETION.**—Mr. Massey-Mainwaring asked the First Commissioner of Works in what year the first plans and elevations were prepared, and by whom, for the completion of the frontage of the South Kensington Museum; how many plans and elevations had since been made, and by whom and when; what was the total sum of money that has been spent on plans and elevations that have never been carried out; and whether it is a fact that a large sum was paid to the widow of a deceased preparer of plans and elevations; and, if so, what was the amount actually paid, and what had become of the above plans. Mr. Akers-Douglas: I believe that plans were originally designed for the frontage of the South Kensington Museum many years ago by General Scott, a salaried officer of the department, and his assistants. Sketch-plans were subsequently prepared in 1883 by the principal surveyor of the Office of Works. In 1891 competitive designs were called for, and those of Mr. Aston Webb selected, and it was in regard to these plans that a special payment of £1,315 was made to Mr. Aston Webb, and a sum amounting to 2,500 guineas to the other competitors and to the architect who acted as assessor. The plans prepared by General Scott, by the Board's surveyor, and by Mr. Aston Webb, are the property of the Office of Works. The model prepared by General Scott is at South Kensington Museum. No sum was paid to the widow of any architect by the Office of Works.

## CHIPS.

The new railway from Salonica to Constantinople will be opened for passengers' traffic on Monday next. The journey occupies 23½ hours.

The memorial stone of a police-office and fire-brigade station in the Queen's Park district of Glasgow was laid on Tuesday. A quiet adaptation of the Scottish Baronial style; the building will cost £18,000.

A portrait of Mr. Samuel Whitbread was unveiled in the Shire Hall, Bedford, on Tuesday, and presented to the county by the lord lieutenant, Earl Cowper, on behalf of the committee of subscribers. The portrait was painted by the Hon. John Collier, and represents the full-length figure of Mr. Whitbread standing in the board-room of the Bedford Harpur Trust. It is a companion picture to that of his grandfather, Samuel Whitbread, who died in 1815. It was subscribed for in recognition of Mr. Whitbread's public services during the 43 years in which he continuously represented Bedford in Parliament.

At Newport, Mon., Police-court, on Wednesday week, Mr. Thomas Prosser, builder, of Caerleon-road, was charged with allowing a house of which he is the owner, Brunswick Villa, Caerleon-road, to be in an unsanitary condition, and injurious to health. The town clerk said the complaint was that sewer-gas was allowed to escape into the house. As defendant had commenced the work required, he would be content with an order for the work to be done within seven days. The Bench thereupon made an order in those terms, with a continuing penalty of 10s. per day if the work was not done in that time.

The French Government have purchased Mr. George W. Joy's picture of "Joan of Arc" from the Salon (hung at the Royal Academy last year, and now represented there by a wood engraving by A. Comfort) for the Luxembourg, and the German Government his "Truth," shown at the Academy in 1894, from the exhibition in Berlin, held in honour of the 200th anniversary of the Academy there.

At a special meeting of the Bristol City Council held on Tuesday, formal sanction was given to the proposal to promote in the next session of Parliament a Bill to enable the mayor, aldermen, and burgesses to carry out the works sanctioned at a former meeting for the prevention of floods. The scheme, devised by Mr. Yabbicom and Mr. McCurich, embraces the construction of two new culverts to deal with the flood water from the Cutler's Mills Brook and the Boiling Wells Stream, the further improving and deepening the course of the River Frome, and the provision of machinery and appliances for discharging flood water from the Floating Harbour. The total cost involved is estimated at about £108,000, an increase of £11,000 on the sum named when the matter was last before the Bristol City Council. At the same meeting, considerable discussion ensued upon the report of the sanitary committee relative to the proposed tramway shelter at St. Augustine's Bridge. On a previous occasion, the matter had been referred back to the committee, with power to obtain designs for a building; but though the committee had awarded a premium of £50 to a plan prepared by Mr. W. Venn Gough, of Bristol, they informed the council that the design submitted by the engineer was most suitable. In the end it was decided that no shelter be erected.



## WATER SUPPLY AND SANITARY MATTERS.

EDINBURGH: THE TALLA WATER SCHEME.—A special meeting of the Works Committee of the Edinburgh and District Water Trust was held on Monday to consider the plans and specifications of No. 2 contract in connection with the Talla water scheme. Contract No. 2 is part of an intended aqueduct to be constructed for the Edinburgh and District Water Trustees from the Talla Valley to Fairmilehead, near Edinburgh. The work embraced in the contract will extend for a distance of five miles, and will consist of 5,846 yards of tunnel and 2,932 yards of aqueduct in cut and cover, together with the necessary shafts, manholes, valve, and overflow wells. The aqueduct commences near Broomlea Station, to the south end of tunnel No. 3, and is to have a regular fall of 1 in 4,000. From this point to the termination of the contract, near Auchencorth farm steading, the fall will be 1 in 5,000. The plans show the tunnels, when lined, to be 6ft. in width by 5ft. 9in. up to the spring of the arch, and 1ft. 9in. from that to the crown of the arch. When solid rock is not found, the tunnels will be lined with cement concrete, with a cement bottom, slightly curved to facilitate the flow of water. The carrying capacity of the tunnels will not be less than 30,000,000 gallons per day. The contract will take about three years to execute. The committee approved of the plans and specifications, and their report was adopted by the trustees at their meeting on Wednesday, when instructions were issued to advertise for the work.

MIDSOMER NORTON.—The Midsomer Norton Urban District Council having applied to the Local Government Board for sanction to borrow £3,000 for the purpose of sewerage and sewage disposal at Welton and new sewers at Rock-road and Redfields, in the parish of Midsomer Norton, Mr. Robert H. Bicknell, C.E., the Government inspector, held his inquiry at the Council Chamber on Wednesday.

WOLVERHAMPTON WATER SUPPLY.—Colonel J. O. Hasted, R.E., a Local Government Board inspector, held an inquiry at the Town Hall, Wolverhampton, on Friday, with regard to an application which has been made by the Wolverhampton Corporation for power to partially repeal, alter, or amend several Acts or provisional orders; to purchase lands at Penn and Wombourn; sink wells and erect water-works; borrow moneys for such purposes, and enable the Corporation to carry into effect agreements made with the Staffordshire and Worcester-shire Canal Company and Lord Wrottesley in connection with the undertaking, and further to execute compensation works if required. Mr. E. A. B. Woodward, waterworks engineer to the Corporation, gave evidence as to the boring operations at Dimingsdale, which had resulted in the finding of water at a depth of 42ft. The bore-hole had been carried to a depth of 240ft. The estimated cost of making the wells, putting down the plant, &c., was £35,000, but towards this £13,250 would be received from the Bilston District Council.

Mr. Robert H. Bicknell, C.E., one of the inspectors from the Local Government Board, conducted an inquiry at Bristol on Tuesday, respecting an application of the corporation for leave to borrow £31,500 for the purpose of wood paving. It is proposed to pave 18 streets or parts of streets, the price for soft wood being 11s. 6d. per superficial yard, and 18s. 6d. for hard. The city engineer (Mr. Yabbicom) explained the proposals.

A serious fire broke out on Wednesday night in a cabinet-maker's warehouse in Charlotte-street, Old-street, Shoreditch. The property attacked first was comprised in a structure occupied by Messrs. Clozenberg and Co., six floors high, 60ft. long, and 60ft. wide, which was destroyed. The fire spread with extraordinary rapidity to the adjacent structures, and to a large timber-yard behind, where great damage was caused.

A group of statuary, including Queen Mary, Maitland of Lethington, and Bishop Leslie of Ross, which has been placed in the central niche of the east gable of the National Scottish Portrait Gallery at Edinburgh, was unveiled on Tuesday. The sculptor is Mr. Birnie Rhind, A.R.S.A. The Queen is in the centre, with the bishop on the one hand and Maitland on the other. On the brackets supporting the niche are carved the Royal Arms of Scotland as used in the time of Queen Mary, with the arms of her supporters on each side. On a shield overhead appear the arms of the Queen, quartered with those of France.

The Public Works Committee of the Birmingham Corporation, at their meeting on Monday, had personal interviews with six candidates for the post of assistant surveyor for the city, under the conditions already resolved upon by the city council. The final selection was deferred till the next meeting of the committee; but the *Birmingham Daily Post* states that their choice will most probably fall upon Mr. Price, of the surveyors' department at Liverpool.

## Our Office Table.

THE Council of the Institute seems to have got into a characteristic fix. On Monday last, we understand, it withdrew *en bloc* the names of the candidates for the Fellowship, because the exclusive clique of Associates had determined to blackball the whole list of proposed Fellows, in order to keep out one presumably objectionable person. Rather than meet a demand for a poll, the Council, it seems, thereupon beat a retreat by dropping the entire list, and rumour reaches us that the Council proposes, in order to checkmate in future the action of Messrs. Owen Fleming, Beresford Pite, and other Associates who form the little *coterie* mentioned above, to devise some plan by which the election of Fellows may be managed by the Council without the necessity of submitting the names of candidates to the general body. If this be so, very probably there will be in the near distance some lively proceedings at Conduit-street. No doubt such a course would be reactionary in its character, whatever the by-laws may allow of. At the same time, it is a fact that men do creep in occasionally unnoticed, as it were, into the rank of Fellows—persons who are no more qualified to grace the distinction—if it be one—than they are to design a decent piece of architecture. It is also undeniable that capable men remain unnumbered among the list of members at all, and this while the presidentship is accorded to those who are distinguished for other records than those more naturally associated with the productions of leading architects. Archaeological fossils are very interesting, but hardly of much use in the front ranks to take the lead of an important society like the Royal Institute of British Architects.

THE eighth ordinary meeting of the Society of Architects for the session 1895-96, will be held at Peterborough on Saturday in next week, the 20th inst., when the Cathedral will be visited. Every facility has been kindly promised for a thorough inspection of that most interesting building, which is now so much attracting the attention of architects. Members will travel from King's Cross Station (G.N.R.), starting at 12.30 p.m., and the company have promised to attach a saloon carriage for their convenience. In order to avail themselves of the cheap fare which will be arranged (7s. 11d., return ticket) members must inform the secretary of their intention to attend by Wednesday next, the 17th inst., and they are invited to bring friends with them, either ladies or gentlemen.

It has been demonstrated, both by microscopical investigation and by experience, that the passage of moisture in wood is always in the direction of the natural growth, and hence posts put in the ground in a natural direction will not readily decay at the top; but if the post is put in the contrary direction, with the butt end at the top, it will quickly show signs of decay, because the moisture will more readily penetrate the pores. Those who put up gate, fence, and telegraph posts are often surprised to find the same timber decay sooner in one place than another, without any apparent cause for its doing so. The reason can only be explained on this principle of natural growth. May not also the duration of window and door-frames, and outer framed work be influenced by the same law?

A SHORT time ago the Leeds and Yorkshire Architectural Society presented a memorial to the Building Clauses Committee of the Leeds Corporation, in which they requested certain alterations to be made with regard to the deposit and disposal of plans. A special meeting of the committee was held on Friday, at which the matters dealt with in the document were fully discussed. There were ten points in regard to which the local architects desired changes to be made, but the committee could not see their way to make any alterations except in two cases. They will endeavour, as asked, to provide a private depositing-room at the office of the building inspector, in addition to the present waiting-room, and the secretary of the Architectural Society will in future receive a copy of resolutions passed by the committee which deal with any portions of the by-laws in a different manner from that in which they have been dealt with previously.

A BILL is pending in the United States Congress which, if passed, would do much to check the frightful waste of timber in that country through forest fires. This Bill, which has been

introduced in the House of representatives with the sanction of the committee on public lands, provides that the Secretary of the Interior shall be authorised to survey and mark, through all public forests which are liable to destruction by fire, avenues, 1,000ft. in width, and five or ten miles apart, running in such directions as will make them most effective in preventing the spread of fire. The timber now standing in these avenues, or ways, is to be offered for sale at public auction, each purchaser binding himself to clear the tract for its entire width, so far as his purchase extends; and, when no bidders appear, the work of clearing the avenues is to be done by contract. The proposed Bill is approved by the American Forestry Association, and would probably, the *American Architect* thinks, be passed without difficulty, were it not for the fact that the work of clearing the avenues, in the forests too far from railroad transportation to make the timber valuable, would involve an expense of, at least, half-a-million dollars, and Congress is not now in the mood for making appropriations which can be postponed.

ACCORDING to the *North-Western Lumberman*, a new use has been found for the pine needles imported from the South. The stiff, slender spines are subjected to a chemical process, which preserves their firmness, are dyed, and then used to make aigrettes for women's hats. It is also stated that quantities of the scrub palmetto, native grasses, pine boughs, Tropical leaves and moss of the Southern woods are used in New York for decorative purposes. One kind of decorative use to which the scrub palmetto is put is to make "prepared plants" for table and room decoration; but the green is too glaringly green to deceive people who can distinguish the natural palm green from the artificial dye. Those who can afford to purchase real palms, flowers, and grasses often prefer to procure these lifeless imitations of nature.

## CHIPS.

Progress with the new town hall for Rotherhithe, which, like many other building works in the Metropolis, has been stopped by the disputes in the trades, has now been resumed. Messrs. Murray and Foster, whose design was selected in competition, are the architects, Mr. Howell J. Williams is the builder, and Mr. Carter the clerk of works.

The death occurred on Saturday morning of Mr. Richard Robinson, builder, Knowsley-road, Ormskirk, after a short illness. As a builder, the deceased has done much to develop the town of Ormskirk in recent years, the Bickerstaffe end of the town having been almost entirely built up by him.

On Thursday in last week four memorial stones were laid of the new Baptist chapel, now building in Harris-street, Peterborough. The chapel, which will be completed about October, is by the side of the present mission-room in Searjeant-street, and will cost about £1,750.

The town council of Nelson, Lancs, have resolved to purchase twenty acres of land for a public park.

The names of George Arthur, Southampton-road, Kentish Town, N.W., builder; and James Childs, Westfield-road, Hornsey, and Cleves House, Boleyn-road, Kingsland, N.E., builder and contractor, appear in the list of receiving orders in last Friday's *London Gazette*.

The Knaresborough Urban District Council are now about to complete the third and remaining section of their scheme of main sewerage and sewage disposal for the town. The engineer, Mr. D. Balfour, M.Inst.C.E., F.G.S., of Newcastle-on-Tyne, has already superintended the execution of the previous contracts for the urban council.

The new pleasure-gardens and concert-hall at Matlock were opened by Mr. Victor Cavendish, M.P., on Thursday in last week. The building has been erected from plans by Mr. James Turner, of Matlock, and Mr. L. T. Wildgoose, of the same town, as the builder. The structure is of rock-faced wall stone, with ashlar dressing and moulded cornices. The roof is covered with Broseley tiles, and iron lattice principals, with a large lantern light and panel in wood. There is accommodation in the hall for 550 chairs, together with ticket office and vestibule. On the east side is a swimming-bath, 61ft. by 24ft., with a facing of concrete and white glazed bricks, and York coping. The dressing boxes will accommodate 14 persons. The incandescent light is used throughout. The laying-out of the grounds has been intrusted to Mr. Turner and Mr. H. Ballington, gardener, Matlock Bank.

It has been decided to perpetuate the memory of the late Mr. G. T. Chretien, for many years one of the churchwardens of St. Lawrence Jewry, by erecting a stained-glass window in the church.



## MEETINGS FOR THE ENSUING WEEK.

**SATURDAY (TO-MORROW).—**St. Paul's Ecclesiological Society. Visit to Orsett Church. Train Fenchurch-street to Grays at 2.32 p.m.

Northern Architectural Association. Annual excursion to Beal, Haggerston Castle, and Holy Island. Train from Central Station, Newcastle, 9.20 a.m.

Incorporated Association of Municipal Engineers and Surveyors. Meeting at Hanley. 11.30 a.m.

**WEDNESDAY.**—Conversation of the Society of Arts, at the South Kensington Museum.

**SATURDAY (JUNE 20).**—Society of Architects. Visit to Peterborough. Train from King's Cross, 12.30 p.m. (7s. 11d. return).

Architectural Association. Day visit to Ipswich. Train from Liverpool-street, 10 a.m.

Edinburgh Architectural Association. Annual Excursion to St. Andrew's.

## CHIPS.

At a meeting of the Court of the University of Wales, held at Shrewsbury, on Saturday, under the presidency of Dr. Isambard Owen, senior deputy chancellor, a design by Sir E. Burne-Jones for the proposed seal of the University was adopted.

The new infectious hospital, Keighley, is being warmed and ventilated throughout by means of Shorland's patent Manchester stoves, with descending smoke flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A new church, to be called the Morison Memorial Evangelical Union Church, is to be erected on the Dumbarton-road, Clydebank, N.B.

Mr. Henry Clarkson, land surveyor, who was associated with George Stephenson, Telford, and others years ago in their railway enterprises, died on Monday at Alverthorpe Hall, Wakefield, in his 95th year.

The waterworks committee of the Hull Corporation selected, on Monday, the following candidates for the post of chief engineer:—Mr. F. J. Bancroft, New Barnet; Mr. T. Raynes, Birmingham; and Mr. J. H. Wheeldon, London.

The 800th anniversary of the foundation of Norwich Cathedral will be celebrated by a commemorative thanksgiving service on July 1st. The sermon will be preached by the Archbishop of Armagh.

A ground-rent of £1,100 per annum secured on a property in Cornhill, facing the Bank of England, was sold by auction on Friday at the Mart, realising £42,500. This is at the rate of £2,452,023 per acre.

In view of the serious encroachments in recent years, action is being taken to acquire Dartmoor for the county of Devon, with the object of preserving it as an open space. The proposal has been taken up with considerable enthusiasm, and at Monday's meeting of the Plymouth Town Council the matter was referred to a committee to draw up a resolution promising the support of the council.

The sewerage works for Mold, Flintshire, which have been carried out at a cost of about £7,000, will be formally inaugurated next week.

The statue of the late Earl Granville, executed by Mr. Hamo Thornycroft, R.A., and recently placed in the Central Hall of the Houses of Parliament, was unveiled by the Earl of Kimberley yesterday (Thursday).

The Scarborough Town Council have decided to erect a public recreation hall in the Clarence Gardens, on the North Cliff, at a cost of £4,200.

A new technical school is about to be built at Bilston for the urban district council. Mr. Wilson, of that town, is the architect.

The annual outing of the Bristol Master Builders' Association has been fixed for Tuesday, the 30th inst., and this year Savernake Forest will be visited, by permission of the Marquis of Ailesbury.

The imports of common woods by the French are increasing. Russia is gaining rapidly in the size of its lumber exports to France. Sweden occupies the first position in supplying France with wood products, Russia second, and Norway third. Now that Canadian woods are only subject to the minimum tariff on their entry into France, it is probable that Canada will soon occupy an important position in the trade.

A large block of infantry barracks is in course of erection on the site of some cottages at Crown-hill, Plymouth. The barracks will cost about £100,000, and will house some 800 persons. Messrs. Pethick Brothers, of Plymouth, are the contractors.

A new Wesleyan chapel, in the High-street at Royston, was formally opened on Friday. The new premises contain a school for 350 and chapel for 450, and have cost about £2,100.

## Trade News.

## WAGES MOVEMENTS.

**THE LONDON BUILDING TRADES DISPUTE.**—The points of difference between the master builders and the various branches of labour have lessened each week since the strike began on May-Day, but the negotiations drag on slowly. The plasterers were said to have come to terms at the close of last week on the basis of an advance, as in other trades settled with, of a halfpenny per hour, all disputes to be referred to a standing committee to consist of three members of the Central Association of Master Builders and three members of the National Association of Operative Plasterers. The action of the delegates was, however, repudiated by the great body of plasterers, and on a ballot being taken, a majority of nearly two to one declared in favour of rejecting the masters' terms; only about 330 plasterers are, however, out. The master builders informed the labourers on Saturday that, unless their offer of a farthing increase be accepted by Tuesday next, it will be withdrawn. The labourers held large meetings at Clerkenwell on Sunday, and decided by large majorities to continue the strike; but another meeting of the men was to be held yesterday (Thursday) to further consider the matter.

**THE LONDON COUNTY COUNCIL AND THEIR PLASTERERS.**—At Tuesday's meetings of the London County Council the Works Committee brought up an urgency report on the Council's list of wages. They stated that a large number of employers had conceded the plasterers an advance in their rate of wages of one halfpenny an hour. They had made inquiries, and satisfied themselves that such was the case, and they might fairly report to the Council that 10d. per hour was the rate now obtained. They recommended that the rate of wages of plasterers should be increased from 9½d. to 10d. per hour. After a long discussion and several divisions, the recommendation of the committee was adopted.

**ARBROATH.**—An agreement has been entered into between the Operative Slaters' Union and the employers in Arbroath, by which the wages will be continued for another year at the rate of 7½d. per hour. Apprentices are now to serve five years in place of four as formerly.

**COVENTRY.**—The Coventry Master Builders' Association and the Operative Bricklayers' Association have from time to time been in disagreement in regard to the short service apprenticeship system. The contention of the employers is that they are entitled to take apprentices over 17 years of age, providing they serve for at least three years; the opinion of the workmen is that apprentices must not be over 17 years of age. It was eventually decided to refer the dispute to the arbitration of the Right Hon. A. H. D. Acland, the Minister of Education in the last Liberal Administration, who decided that, according to the existing code of rules, the employers are right in their contention.

**EDINBURGH JOINERS' STRIKE SETTLED.**—The Edinburgh and Leith Master Builders' Association held a meeting on Friday, at which it was resolved to adopt the working rules as amended at the conference, including the clause providing for payment of overtime after 45 hours a week in the winter months. The rules were signed on behalf of the Association by the chairman of the meeting, Mr. J. R. Watson, and the secretary, Mr. John Nicoll. The result was communicated to the men on strike, who were holding a meeting in the Oddfellows' Hall. It was received with cheers. A number of congratulatory speeches on what the men regarded as their victory were subsequently delivered, and the committee were awarded a vote of thanks for their labours. The men returned to their work on Monday. The rules just adopted remain in force until 15th April of next year.

**LEEDS.**—The strike, which commenced on the 1st May, is being continued, and at present neither the bricklayers and labourers on the one side nor their masters on the other are disposed to yield. The stoppage of work is having a serious effect upon the trade. Building projects, which would have been commenced but for the protracted contest between employers and employed, are being now put aside.

**MANCHESTER.**—The members of the Manchester branch, No. 1, of the Amalgamated Union of Upholsterers have obtained from their employers a reduction of working hours from 52 to 48 per week, with a continuance of their wages at 36s. per week.

**TONBRIDGE.**—At a meeting of the carpenters and joiners in Tonbridge, held on Friday evening, in connection with the Amalgamated Society, it was decided to apply to the employers for a rise in wages from 7d. to 8d. an hour, and for a code of regulations as to hours and overtime.

**TYNESIDE.**—The building trade on Tyneside is still keeping good, although not entirely free from disputes. The latest between the plasterers and

bricklayers is not yet settled, the dispute being as to which branch shall lay cement hearths. With regard to the slating branch, the steamer *Penrhyn* from Bangor slate quarries is discharging a cargo of about 400 tons for Mr. John Hewitson, of Newcastle. These steamers, which come from Wales in three days, are cutting out the old sailing vessels, and competing with the railway company as to freight and time.

At the Royal Victoria School for the Blind, Benwell Dene, Newcastle-on-Tyne, a new recreation-hall, seated for 500 persons, is being erected. It has been designed by Mr. W. Lister Newcombe, of Newcastle, and is being built by Mr. Pringle, contractor, of Gateshead.

In the Court of Queen's Bench on June 4, Mr. Justice Cave and Mr. Justice Wills heard the appeal "Williams v. Groves," from a decision of Somerset justices, who had refused to convict the respondent for violating a by-law of the county council requiring a timber carriage to carry lights both in front and rear when driven along the highways between sunset and sunrise. The justices had held the by-law to be unreasonable, but their Lordships upheld its validity, and allowed the appeal. The case of "Walker v. Stretton" was cited for the appellants, and that of "Strickland v. Hayes" for the respondents.

The work of "slewing" the down line of rails from the old wooden viaduct on to the new stone viaduct at Milltown, about a mile west of Lostwithiel, was carried out last week. The new viaduct, erected by Messrs. Relf and Son, Plymouth, was opened twelve months ago. Only the up line, however, was then run over it, and until Sunday last down trains still continued to run over the picturesque old timber viaduct, which, being now in disuse, will be torn down.

Earl Beauchamp has received a deputation consisting of the Lord Mayor of Dublin, Councillor Beardwood, and Sir Charles A. Cameron with reference to a Bill introduced by the Government to amend the definition of public sewers and drains in the Public Health Act. The Earl of Mayo explained that the Corporation of Dublin were anxious that the Bill should be extended to Ireland, and the Corporation of Belfast were also in favour of such extension. Earl Beauchamp, in reply, expressed his willingness to have the provisions of the Bill extended to Ireland.

The new sanatorium at Sutton Coldfield, the gift of Lieut.-Col. J. H. Wilkinson, was formally opened by the Lord Mayor of Birmingham last week. About £2,000 has been spent in alterations and furnishing. It is intended to accommodate about sixty inmates—thirty of each sex—and for this purpose the institution has been divided into two wings. Beside the twenty-six bedrooms there are sitting-rooms, reading-rooms, recreation-rooms, dining-rooms, and a billiard-room.

The Bishop of Truro is evidently hopeful of seeing the nave of the cathedral built during his day. In his primary visitation charge at the cathedral last week, he spoke of the completion of the spire, now broken off in a blunted condition at half its height, as a work "which their children would do"; but the nakedness of the western wall, he added, prayed for the nave which they themselves would complete, with the blessing and help of the Lord.

A memorial cross has been erected in Rand Churchyard, Lincolnshire, from the design of Mr. Chas. H. Fowler, M.A., F.S.A., of Durham. It stands some 14ft. high, the stone used being Mansfield Woodhouse yellow limestone. The design, as executed, consists of two steps or landings, on which rests a square base, bearing inscriptions; then a second base richly moulded and stopped, having carved panels on each face, containing shields carved with the emblems of the passion of our Lord, copied from the famous Bishop Burghurst Tomb in Lincoln Minster. From this rises an octagonal-beaded shaft surmounted by carved and traceried cap, on which stands the cross proper. This is again enriched with carved patterns running up the angles, the arms being finished as carved finials. The work has been carried out by Messrs. Tuttle and Son, wood and stone sculptors, Lincoln.

The proprietors of the buildings that have been erected in the Haymarket, Newcastle-on-Tyne, on the site of Dr. Bruce's Academy, have resolved to commemorate the connection of the historian of the Roman Wall with the place. When the premises were erected, a canopied niche was left to receive a statue, and a figure of the late Dr. Bruce, designed by Mr. Ralph Hedley, has been placed there. Beneath the statue is a brass tablet, inscribed thus: "John Collingwood Bruce, LL.D., D.C.L., F.S.A. Site of Percy Street Academy, founded by John Bruce in 1806, and conducted by John Collingwood Bruce from 1834 to 1860." Above the inscription is the Bruce shield, with the words "Do well and doubt not." Mr. Justice Bruce will unveil the statue next month.



## CHIPS.

The Roman Catholic Church at Castletownroche was totally destroyed by fire on Thursday in last week.

A quarryman, named Brown, was breaking stones at the Aytton Whinstone Quarries, near Middlebrough, on Thursday in last week, when he was struck by lightning and killed.

New and commodious schools, which have been erected on the Sheldon-road, Chippenham, at a cost of about £1,250, were reopened on Wednesday.

Earl Derby has promised to perform the ceremony of opening the new technical schools and free library which have been erected by the Widnes Corporation at a cost of about £12,000. The ceremony will take place either on Thursday, July 30, or August 6. The buildings are English Renaissance in style, and are faced with red Ruabon bricks, terracotta being employed for dressings. Messrs. Woodhouse and Willoughby, of Manchester, are the architects.

At the Estate Market, Tokenhouse-yard, last week an aggregate of £123,957 changed hands. In the provinces there has recently been greatly improved activity, sales to the extent of over a quarter of a million sterling having been reported at the Estate Exchange last week.

The British Government have decided to take part officially in the Paris Exhibition to be held in 1900.

The Mayor of Harrogate, Mr. David Simpson, a builder in that town, has been placed on the commission of the peace for the borough.

Colonel Cope, one of the Local Government Board Inspectors, held an inquiry at the Town Hall, Leicester, last week, respecting applications from the town council for sanction to borrow £24,800 for works of public improvement, about half that sum being required for repaving thoroughfares.

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immediate use.

## TENDERS.

\* \* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BARROW-ON-HUMBER.—Accepted tenders for the erection of lodge and other buildings at the cemetery. Mr. Kitching, architect:—

Bricklayer:—	
Tinkler, Thornton	£145 10 0
Joiner and painter:—	
Stainton, Barrow	92 10 0
Stonemason:—	
King, Barton	37 0 0
Plumber:—	
Kitching, C., Hull	10 0 0
Slater:—	
Tolkard and Son	21 5 0
Ironwork:—	
Wade	45 0 0
Total	351 5 0
(Architect's estimate, £400.)	

BRISTOL.—For the erection of the Eastville boys' school, for the City School Board:—

Hatherley and Carr	£6,497 0 0
Humphries, G.	6,295 0 0
Forse, H. A.	6,250 0 0
Love and Waite	6,150 0 0
Love, E.	6,120 0 0
Williams, S.	5,995 0 0
Davies, J. E.	5,967 0 0
Clark, E.	5,957 0 0
Hayes, C. A.	5,937 0 0
Martin, F.	5,905 0 0
Wiltshire, J.	5,628 12 10
Perrott, J.	5,597 0 0
Wilkins, G. H.	5,448 0 0
Browning, J., Fishponds, Bristol*	5,400 0 0
Rossiter, H. J.	5,390 0 0

\* Accepted.

BRISTOL.—For paving footways during a period of three years, for the city council:—

Accepted tenders.—No. 1 district:—	
Galbraith, W.	£1,022 0 0
No. 2 district:—	
Mangotsfield Pennant Stone Co.	1,079 0 0
No. 3 district:—	
Pennant Stone Firms, Ltd.	1,847 0 0

CARNARVONSHIRE.—For new cloakrooms attached to Nantle School, Nantle Green, R.S.O., Carnarvonshire, for the Llandwrog School Board. Mr. Rowland Lloyd Jones, 14, Market-street, Carnarvon, architect:—

Hughes, T., & Griffith, W., Llanfair, P.G., Anglesey (accepted)	£222 0 0
Trigg, T. A., Gelli Nantle	188 19 0
Jones, R., Llanwnda	174 0 0

CARNARVONSHIRE.—For new cloakrooms attached to Penforddolen School, Penforddolen Green, R.S.O., Carnarvonshire, for the Llandwrog School Board. Mr. Rowland Lloyd Jones, 14, Market-street, Carnarvon, architect:—

Jones, R., Llanwnda	£334 0 0
Hughes, T., & Griffith, W., Llanfair, P.G., Anglesey (accepted)	290 0 0

CARNARVONSHIRE.—For alterations and additions to Bronyfoel School, Groeslon, R.S.O., Carnarvonshire, for the Llandwrog School Board. Mr. Rowland Lloyd Jones, 14, Market-street, Carnarvon, architect:—

Jones, R., Llanwnda	£2,279 0 0
Trigg, T. A., Penygroes, R.S.O.	2,090 0 0
Hughes, T., & Griffith, W., Llanfair, P.G., Anglesey (accepted)	2,079 0 0

CLETHORPE.—For furnishing the new board school in Braconr-street. Mr. Croft, architect:—

Illingworth & Co., Leeds (accepted)	£350 0 0
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COLCHESTER.—For supplying an installation of the electric light, for the corporation:—

Electric Construction Co. (accepted)	£10,675 0 0
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DIEPPE.—For furnishing and fitting up a new hotel at Pays, near Dieppe:—

Allen, J. J., Poole-road, Bournemouth (accepted).	
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DURHAM.—For new residence, Victoria-terrace, Western Hill. Mr. George Ord, 16, The Avenue, Durham, architect and surveyor:—

Bradley, J. G. (accepted; private tender).	
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FACIT, ROCHEDALE.—For enlarging the mills and warehouses at Facit, for Messrs. Smithson Bros.:—

Farrow & Shaw, Whitworth, about £3,000 0 0	
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(Accepted.)

HALES OWEN.—For building a technical institute adjoining the drill hall:—

Tate, J. M., Colley-gate, Cradley (accepted).	
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HAMSTEAD.—For alterations and additions to the Alliance Hotel, West Hampstead, for Mr. S. S. Death. Mr. Arthur O. Breeds, F.S.I., 62, Lincoln's Inn-fields, architect. Quantities by Mr. G. Silvester, 46, Strand, W.C.:—

Charteris, D. J.	£2,648 0 0
Minter, F.	2,600 0 0
Todd, G. S.	2,522 0 0
Mark, F.	2,474 0 0
Turtle and Appleton	2,390 0 0
Courtney and Fairbairn	2,375 0 0
Parker, G.	2,295 0 0
Oldrey and Sons	2,280 0 0
Gould and Brand	2,235 0 0
Yerbury and Sons (accepted)	2,189 0 0

HORSHAM.—For repairs, painting, &c., to the Nelson Inn, Horsham, for Messrs. King and Sons, Ltd. Mr. C. H. Burstow, F.I.A.S., 40, North-street, Horsham, architect:—

Petheridge, M.	£65 0 0
Potter Bros.	50 10 0
Potter, G. Hurst-road (accepted)	49 10 0

HORSHAM.—For painting, paperhanging, hot-water and gas services, &c., to the Black Horse Hotel, Horsham, for Mr. Henry Michell. Mr. C. H. Burstow, F.I.A.S., 40, North-street, Horsham, architect:—

Contract 1.		Contract 2.	
Sendall Bros., Horsham	£458 10 0	£32 0 0	
Pannett Bros.	375 12 9	42 0 0	
Alldridge, W.	323 0 0	27 10 0	
Potter Bros.	282 0 0	20 5 0	
Potter, F.	279 0 0	20 0 0	
Potter, G.*	262 14 0	35 1 6	

\* Accepted for contract No. 1.

ILFORD.—For the erection of a pair of villa residences in Scrapton-road, for Messrs. D. and J. Green. Mr. Horace J. Cropper, Ilford, architect and surveyor:—

Key, W. G., Ilford	£798 0 0
Carter, H. J., Grays	795 0 0
Willmott, F., Ilford*	785 0 0

\* Accepted with slight alterations.

KILBURN.—For the erection of a church lecture-hall, Salusbury-road, Kilburn (first contract). Mr. Arthur O. Breeds, F.S.I., 62, Lincoln's Inn-fields, W.C., architect. Quantities by the architect:—

Giles, F., and Co.	£1,581 0 0
Taverner, C., and Co.	1,530 0 0
Minter, F.	1,500 0 0
Parker, G.	1,458 0 0
Mark, F.	1,450 0 0
Gould and Brand (accepted)	1,424 0 0

LEEDS.—Accepted tenders for the erection of public baths in Springwell-road, Holbeck, for the Leeds City Council:—

Mason's work:—	
Wright, J. T., Hartley Hill	£4,000 0 0
Joiners' work:—	
Oakes, G., and Sons, Hunslet	1,160 0
Plumbers' work:—	
Barrand, W. and C., Carlton Works	198
Fireproofers' work:—	
McFarlane, S., Cookridge-street	748 16 0
Plasterers' work:—	
Branton, R., and C., Lovell-road	66 10 0
Slater's work:—	
Shevill, W., Canal Wharf	265 18 0

Painting:—  
Gaunt, J., Upper Wortley ... 278 0 0  
(Total amount of accepted tenders, £8,517 4s.; 93 tenders received.)

LIVERPOOL.—For additions to the administrative block at the City Hospital in Priory-road, for the city council:—

Raffie and Campbell, Shaw-street, Liverpool (accepted)	£880 0 0
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LIVERPOOL.—For repairs to the City Hospital, East, in Mill-lane, Old Swan, for the city council:—

Chadwick, W. F., Great Howard-street, Liverpool (accepted)	£135 0 0
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LIVERPOOL.—For the erection of a shelter, dressing-room, and conveniences at Wavertree Playground, for the city council:—

Morrison and Sons, Wavertree	£733 0 0
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(Accepted.)

LLANRUG.—For new cloak-rooms, &c., to be added to Brynery and Glanmoelw Schools, for the Llanrug School Board. Mr. Rowland Lloyd Jones, 14, Market-street, Carnarvon, architect:—

Thomas, W., and Jones, J. R.	£823 0 0
Owens, O., and Jones, H., Llanberis	649 9 0
Hughes, E. T., Cwmlygo, Carnarvon*	620 15 0

\* Accepted.

LONDON.—For further works at 1, Rutland-gate, S.W., for Mr. John Rose Auldjo. Mr. R. Owen Allsop, architect:—

Bywaters, S. H. and A., and Sons	£898 0 0
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(Accepted.)

LONDON.—For fitting-up new laundry at Poland-street Workhouse, W., for the Guardians of the Westminster Union. Messrs. Jno. Waldram and Son, 17, Buckingham-street, Charing Cross, W.C., engineers:—

A.		B.	
Manlove, Alliott, and Co., Ltd.—			
£1,920 0 0	£1,710 0 0	£2,140 0 0	
Mallett, C. S., and Co.—			
1,865 0 0	1,617 0 0	2,028 0 0	
Fraser, W. J., and Co.—			
1,740 0 0	1,675 0 0	1,930 0 0	
Barford and Perkins—			
1,644 0 0	1,587 0 0	1,839 0 0	
Fraser and Fraser, Ltd.—			
1,588 0 0	1,460 0 0	1,838 0 0	
Moore, Herbert—			
1,580 0 0	1,440 0 0	1,720 0 0	
Johnson and Mannors—			
1,575 0 0	1,450 0 0	1,725 0 0	
Berry, L. D., and Sons—			
1,553 0 0	1,427 0 0	1,808 0 0	
Thomas and Taylor—			
1,533 0 0	1,533 0 0	1,788 0 0	
May, J. and F.—			
1,494 0 0	1,427 0 0	1,754 0 0	
Summerscales and Sons—			
1,475 0 0		1,606 0 0	
New and Mayne—			
1,442 0 0	1,290 0 0	1,457 0 0	
Moorwood and Sons—			
1,280 0 0	1,210 0 0	1,370 0 0	
Engineers' estimates—			
1,550 0 0	1,395 0 0	1,760 0 0	
A.—If drying-rooms in lieu of drying-houses. B.—If with steam ironing-machine.			

LONDON.—For rebuilding the Running Horse Public House, Little Queen-street, Holborn, W.C., for the Directors of the Wrenlock Brewery Co. Mr. T. H. Smith, 17 and 18, Basinghall-street, E.C., architect:—

Colls and Sons	£4,530 0 0
Allen and Sons	4,335 0 0
Beer and Gash	4,271 0 0
Bush, A.	4,210 0 0
Dearing and Son	4,180 0 0
Gough and Co.	4,144 0 0
Nightingale, B. E.	4,093 0 0
Anley, J.	4,078 0 0
Asby and Horner (accepted)	3,927 0 0
Holloway, H. L.	3,910 0 0

LONDON.—For redecoration of Presbyterian Church, Colebrook-row, City-road, for the Church Committee, under the superintendence of Messrs. William Eve and Son, 10, Union-court, Old Broad-street, E.C.:—

Campion	£334 0 0
Rhodes	325 0 0
Emmott	278 0 0
Small	269 0 0
Brown, Stoke Newington*	262 0 0

\* Accepted.



# THE BUILDING NEWS

## AND ENGINEERING JOURNAL.

VOL. LXX.—No. 2163.

FRIDAY, JUNE 19, 1896.

### SOME BURNING QUESTIONS.

THE London County Council fears it cannot afford the new street. The Metropolis wants it; but that does not matter. The Metropolis must go without it, because the Council requires a million and a half, or thereabouts, for its own glory. Year after year it has had the street under consideration. It is not only a public inconvenience, but a public disgrace, that there should be no sufficient thoroughfare from north to south in the very heart of London. All the way from Farringdon-street to Charing Cross there is no road, except a makeshift one, from Fleet-street and the Strand, to Holborn and New Oxford-street. But the Council always told us to keep up our spirits. They were going to make one, and a grand one, perhaps even in the present century. They were considering, and calculating, and consulting, and the final result of all their thought and labour and expense would astonish us. If this is it, it *does* astonish us. That a body elected to represent London should coolly sacrifice London's vital necessities to their own foolish vanity is more than we could have expected, even from that parish vestry magnified 20 diameters under which we live and move and have our being. It wants a palace for itself: and, therefore, its constituents must muddle on as they can! All the palaces in the world would not make such a self-seeking, self-aggrandising assembly respectable. Considering who a large proportion of its members are, and to what sort of surroundings they must have been accustomed, their sudden resolve to have a council chamber at the cost of £1,313,000, suggests nothing more flattering to them than the old proverb about "beggars on horseback."

Perhaps, however, the Council will not live to need a new chamber. Perhaps its present move will even have the effect of making that supposed necessity less pressing. Apart from political questions, people are more and more coming to see that the management of London involves two very different classes of business. There are some few matters which affect the whole of the Metropolis alike, and which must necessarily be discussed and settled by representatives of every part of it. But there are a much greater number of questions which may much better be settled separately in separate localities, and some which hardly anyone, except the representatives of those localities, really understands. Why should the members for Lambeth and Stepney and Whitechapel help to manage things specially relating to Mayfair and St. John's Wood? Why, in return, should the members for Kensington and Islington and Clapham meddle with all the ways and doings of Commercial-road and the Tower Hamlets? As things now are, the wishes of every locality are liable to be set aside by a sweeping majority from other localities. London, which is not a town, but a province, wants real, and not nominal, local self-government. To manage it in a practical way, at least five councils are necessary, although the five must be able, on special occasions, either to unite or to send representatives to a central body having charge of those exceptional affairs which concern all London alike. But at other times the proper place for each Council would be in its own district, at its own council-chamber. North London, South London, East London, West London, and Central London would naturally form

distinct districts, each with some unity of interests in it, and each, with a healthy rivalry, trying to manage better than the other districts. London, as a whole, is too large and too heterogeneous to have any pride in itself. Its right hand does not know what its left hand is doing. But if the North were vying with the West, and the South with the East, we should get at last some of that honest effort for excellence and economy which other cities manifest, and which the present unwieldy County Council has given up even pretending to. If some change of this sort comes to pass, there will be no need to spend a million and a half, or anything like it, on a general meeting-place. Four district council-chambers would be needed; but the councils which will occupy them, being small enough to undertake real and useful work, are likely to seek for respect by means of their doings, and not of their dwellings. £60,000 each would be a very liberal allowance for housing them handsomely, and a million would be saved from the present mad frolic towards making the indispensable new street from Holborn to the Strand.

So much for one question, and the biggest. The competition question, which comes next, is always burning, and it flamed up at the recent Conference of Architects in Manchester. Mr. Salomons complained that by competitions the public obtain the work of an architect for practically nothing. They do it, he said, in this way. Fifty architects send in designs for a building costing £7,000. Each design costs at least £10 to prepare; therefore the profession spends £500 on a scheme which, at 5 per cent. commission, will only bring in £350 to the successful competitor. Yet, even at this rate, the architect fares better than the average barrister, who (taking prosperous and unprosperous together) is said to lose about £200 a year by the cost of his training, his fees, and his office expenses. Mr. E. T. Hall admitted the unsatisfactory result of competitions; but asked what could be substituted for them. Mr. Bradbury, the President of the Liverpool Society, suggested that members of the R.I.B.A. should pass a self-denying ordinance, and agree not to enter any competition unless it were confined to members of that body. Mr. Waterhouse supported him, and thought it a very graceful suggestion from a gentleman who was not himself a member of the Institute. No speaker said anything about unqualified assessors, or blundering decisions, or foolish "conditions." But Mr. Waterhouse, who was himself a competitor for the Strand Law Courts, incidentally stated that Mr. Street was hampered there by innumerable instructions—many of a most restrictive character; and that one in particular forced him to place the Central Hall at least a story below the various courts. As Mr. Hall, Q.C., remarked, the main object of this hall should have been to provide a place into which everybody could go; into which every court should empty. They should all have been ranged round it, so that anybody could pass straight across from one court to another. Instead of that, it is a mere gulf to separate them; and this great mistake, for which ignorant persons blame the architect who was worried into his grave by the bullies and busybodies of his period, now turns out to have been of their doing, and not his own.

Mr. Bradbury, no doubt, made his suggestion in perfect good faith; but we are strongly of opinion that it would neither benefit the Institute, the public, nor the profession generally. It would be the rarest of rare things for the promoters of a new building in the provinces to shut out their own friends and fellow-townsmen from a chance of the spoils. Few, if any, of these would be members of the R.I.B.A.; but, for all that, it is they, in their neighbours' estimation, who would be the swans, while the Conduit-street gentlemen would simply be

looked on as the geese from a distance. As matters now are, the latter do sometimes carry off a prize, and show that they are not quite such geese as they are taken for. But if this risk could be done away with—as it would be by the adoption of Mr. Bradbury's plan—how pleasant things would be for the local practitioner! It was predicted at Manchester that he would then hasten to join the self-denying Fellows and Associates. Perhaps he would advise his friends—and especially his clever friends—to join; but we apprehend he would be far too wide awake to do so himself. The new state of things would exactly suit him. Half the rivals he had to fear—and perhaps the most dangerous half—would have tied their own hands, and relieved him from all anxiety about them. Nothing could be more satisfactory for him: nothing could tempt him more strongly to hold fast the freedom he possessed. Mr. Bradbury, in short, seems to be beginning at the wrong end; he starts with the competitors, when he ought to start with the promoters. If he, or anybody else, can induce committees, or clients, or others in charge of new schemes, to limit their competitions to members of the Institute—well and good. That, no doubt, would induce outsiders to come in, or to try at it; and that might bring competitions under control, and get better conditions for architects, and better results for those who require architecture. But how can it be managed? Certainly not by a general strike of the R.I.B.A. against outsiders. The relations of the "ins" and "outs" are not at all those of the trade unionist and the free labourer. They are friendly enough; and even if they were not, the public, on whom everything in the affair depends, are more likely to take the part of the outsider than of the Fellow or Associate.

Another question which has evolved some warmth, was brought forward at the Manchester Conference. It relates to the admission of new members to the Institute. Many architects, long in practice, would, it is said, seek admission; but they do not like being voted on, and possibly rejected, by associates much younger than themselves. It is no secret that there is a movement going on to insist that except in the case of outsiders who have produced work of decided merit, all future Fellows shall be chosen from the class of Associates. The only fault we find with this movement is that it does not go far enough. The thing to aim at is to insure that, sooner or later, nobody but men of ability, *whether Associates or not*, shall be elected as Fellows. The title will then mean something. It will be worth still more if the number is limited, as, for instance, the number of Royal Academicians is; though the limit need not be equally narrow. Then it will be recognised by the public, and they will begin to understand that an architect is not simply a more respectable brother of the speculative builder. But if this happens, as we hope, alike for the sake of our art and of its practitioners, that it will some day happen, what is to become of the large class who have long been in practice, who are not good enough to become ideal Fellows, and not young enough to take part in examinations and run the risk of being plucked? A great part of the world everywhere is too bad for blessing and too good for banning, and it is not the theologian only who is at a loss about its destiny. This problem of the ages has at last come home to the Institute.

It is a more pressing problem now than it is likely to be in 20 or 30 years' time. We have to do with a race which grew up and went to work before our examinations began. There are all shades of merit and demerit amongst them, from the man who can build though he cannot design, down to the impostor who can do neither the one nor the other. It is only the pick of the class who



can be taken into account. The Institute does not want the self-styled architect who was developed out of a jerry-builder, who is a house-agent and an auctioneer, and a general doer of odd jobs and dirty work. But there is no reason why it should not recognise, in his right place, the man who is arranging for honest and useful construction—say in factories or warehouses and the like—although his artistic faculty may chance to be small. The misfortune is that at present it can only admit him as a Fellow, and a Fellow he is utterly unfit to be. As things now are, indeed, he would find too many of his like at Conduit-street to feel "lonesome." But we are looking forward to, and trying to bring nearer, the time when these will have departed, and when a man will have to be an architect in more than name before he can be a Fellow of the Institute of Architects. It will put off that good time for years or for ever if more Fellows are now admitted who lack the primary qualification, and the Associates will do valuable service if they blackball every candidate rather than allow the Institute to be swamped by Fellows who do not deserve the title. The question is, whether it cannot admit them to a class of their own, and give them a designation which will describe them as what they are, and not as what they never will be. If it cannot do that, there is no alternative but to leave them outside. Its clear course to honour and respect is to have fewer Fellowships, held by better men.

#### INITIAL SUPERVISION.

GENERAL supervision of buildings includes certain duties and attentions that may appear to many in the profession matters of little moment. It is assumed that the architect's superintendence begins and ends on the building; that it is not his duty to go beyond or behind the building or the builder's workshop; and that he has no right to inquire where the stone, or the brick, or the timber comes from, or whether an iron column or girder has been cast or tested according to certain methods that are approved. No doubt that practically the architect is limited to those more direct duties; he has seldom the time or the opportunities of inspecting quarries, or brick or timber-yards, or of visiting a foundry that may be in the North or West somewhere. Yet they seem to be part of his duty. We do not see how he can enforce his requirements by simply inspecting materials as they are brought on to the site of building, or pass them simply on the word of the foreman or contractor. There are some things that if he wants done well, he must see to them himself. Much trouble and cause of disagreement would be spared both to contractor and architect, if the latter could see materials before they were brought on the works, and inspect the workmanship while in progress. But what are the facts? A load of bricks comes on the works, which the architect or his clerk of works cannot approve—they are shaky, or their colour is not good—and are condemned, and all the labour and carriage might have been saved if the brickyard had been visited, and the quality of bricks decided on at the onset. Again, how much difficulty and friction would be saved if the architect could only see any particular piece of work in the workshop while it was being put together; if he could see, for instance, how his design for staircase was being worked to, and be able to correct any detail or suggest any improvement that might appear, or make clear to the operative his working drawing. But the probability is, he does not see it till it is fixed in the building. He passes what he sees and what he does not see, though there may be many things that are wrongly executed.

Too much is taken or accepted on report and

recommendation. Of course, it saves a lot of time and trouble; but experience teaches how fallacious it is, for example, to adopt a particular stone on an expert opinion, or on the authority of a textbook. A report on any material like stone is worthless as a guarantee that the stone sent on the building is of the proper quality. The particular sample tested or reported on is not at all likely to be the same as the stone supplied, which may be from another part of the quarry, and the quarryman knows that the quality is never the same, and that for an average quality constant examination is necessary; but the common idea seems to be that when a given quarry has obtained a good name, its yield is uniform, and can be depended on. And is it not much in the same way that failure so often occurs in ironwork? The architect accepts the report of the testing of certain specimens by a well-known expert, and henceforth concludes that all the other ironwork columns or girders can be relied upon; or that because a certain tensile strength has been reached by a cement, that all the cement supplied will be of the same excellence. What absurdity! When will the architect and engineer begin to understand the maxim that "there is nothing so false as facts, and nothing can lie like figures." If we substitute the word "tests" for facts, we shall be equally right. We have also those who mistake formulae for facts, believing as they do that they are all the same, and are conducted by the same class of men. Not a bit of it. Men of facts are seldom the same individuals as men of formulae. And it is this distinction which the architect might do well to remember. He has been too long a specifier of theories and formulae, not a discoverer of facts. We know of cast-iron work being absolutely spoilt from being cast from imperfect patterns and moulds. Sometimes a broken casting is used for moulding from instead of clean wood patterns? Who can wonder that contractor's ironwork is often fractured in consequence? If the architect wants a proper capital, cantilever, or stanchion, it is better for him to supply a full-size detail template or pattern made from his design than to furnish merely a sketch or dimension which are often too rough or imperfect to enable a proper pattern to be made. But this is a sort of work he seldom does. He leaves it entirely to the contractor or founder.

There are some things which fall to the duty of the architect the neglect of which incurs a heavy responsibility, though they are in less regard than matters like drainage and substantial construction. How few of the profession ever personally see to the fixing or setting of columns and girders. The specification sets forth a certain depth and foundation of concrete or brickwork for a column; but who sees whether it is carried out (we are supposing there is no resident clerk of works)? Should the specified depth be not enough owing to a spring, or the substratum is not solid at that depth, is there any guarantee that an extra depth is excavated? Suppose a stanchion or an iron girder is to be imbedded in brickwork or masonry, who is to see whether the portion inclosed has been painted or coated with an anti-corrosive paint or varnish? It is extraordinary how much ironwork is hidden away or buried in this way without any preparation. Who is to see whether the brickwork round the end of a girder is impervious to moisture or air, and whether the iron itself is properly cleaned before it is coated? It is surely the architect's duty to inspect these details if he has no one else to do so. Superintendence is of little value if it only means looking at work already in place, much of which is hidden from view. A great deal depends on the preparation of materials, on the preparatory stages of work at the shop, which the architect seldom inquires into. Let us look for a moment on the chances of

ironwork being well prepared before fixed in a building. A specification is given which describes the quality of iron or steel, and referring to detail drawings, that it is to be coated or painted with a certain preparation before fixing. Who inspects the iron castings or wrought iron before it leaves the shops? Who sees whether the scale or "skin" of cast iron, as it leaves the mould, is allowed to remain, or is scraped or planed away? It is now acknowledged by all competent authorities on the subject that the silicate scale of cast iron should be preserved; that this "skin," which is fused sand or loam, should be coated with oil or paint soon after the ironwork is cast, for if it is not so coated, oxidation of this skin will take place, and the paint afterwards applied will become detached. But who is really responsible? The architect is not, and cannot be, held responsible in such a matter. The contractor is, no doubt, the proper person to see that the ironwork is properly prepared before it is fixed, but he leaves it to the ironfounder. It is well known also that if a cast girder or iron column is planed or turned after it leaves the mould the scale is removed, and active corrosion is sure to ensue; yet we know this is often done. With wrought iron and steel the case is different: the skin in these cases must be removed, for in the process of rolling the wrought iron is exposed to the air, and oxidation commences in however slight a degree, and the film covers the surface unevenly, and corrosion takes place on the bare portions. The architect's duty is to specify that the film or black oxide which covers a rolled plate be removed, and the iron surface painted. On the authority of Dr. Siemens, and the requirements of the Admiralty, it is necessary that the skin on steel plates be removed, and the surface well cleaned of it by dipping in an acid solution. Unless the film is thoroughly removed, rust begins under the paint which happens to cover any of the film. Suppose a number of wrought iron or steel casements were specified; it is well known that galvanic action would be set up between the metal casement and frame, if the surfaces were not properly cleaned, washed, or "pickled" in a bath of dilute acid, or unless the casements were treated with the superheated steam or Barff's process. But with all the talk of the right way of doing things, no one seems to be any the wiser. Architects still specify the old formula:—"The iron work to have three coats of good oil paint"; but whether it is put on "over" the rust, no one appears to know, or, for the matter of that, care. A number of people think that rust cannot go on under paint, not knowing that where once it has commenced oxidation will go on apace.

And is not the average builder generally indifferent about the way iron is fixed, or its contact with timber or wood?—notwithstanding facts have shown that where iron is in contact with wood it gradually is destroyed or corroded by the acid. Mr. Ewing Matheson, among others, has described the condition of the main girders of a bridge—namely, that wherever they had been in contact with wood, especially where the latter had decayed, the iron was much corroded. Other instances can be mentioned which support this now admitted fact; but still architects and engineers go on placing their girders and tie-rods in connection with wood. We have dwelt on only one instance where inattention to the preparation of building materials may be of more serious consequence than the design of a particular detail; but there are many other instances that will occur to the mind of the reader. The rigid fixing of an iron girder in a brick wall without any means of allowing free expansion or contraction; an arched rib without hinged joint, or the want of ventilation round the end of a timber beam resting in a wall; the foundations of piers and columns; the due testing of cements and their admixture are



matters which every now and again thrust themselves rather awkwardly before the architect—details, indeed, which he thinks do not come within the scope of his "superintendence," but have a disagreeable way of asserting themselves. In these and other cases the mischief is done before the materials come on the ground, or are fixed in the building. No amount of care and afterthought will then remedy what ought to have been provided for in the way of preparation.

#### ROYAL INSTITUTE OF PAINTERS IN WATER-COLOURS.

IN many respects the yearly exhibition of studies and sketches at the Institute Galleries in Piccadilly has greater interest and value than the more finished works which we are accustomed to see on the walls; and for this reason they are more suggestive of the master's manner and style. In these rougher sketches and studies we see the painter's first, and often happiest, impressions of nature; the direct and unspoilt suggestions of effect, whether of subject, light and shadow, or colour, sunshine or breeze. Crude and rough as some of them are, they often give with more directness and vividness the transient or momentary effect of the subject than the finished or "worked-up" picture, which has lost much in the process of amplification or elaboration. Comparing these sketches in water-colour with those of the early school of water-colour painters, it is of interest to notice how the styles of the modern school compare with the earlier in the century, the period of De Wint, Cozens, Girtin, Varley, Cotman, Pyne. We have few, indeed, examples of the "stained" drawing, which was a sketch with reed-pen sustained by washes in brown, neutral, or blue, or, rather, a wash or tint sketch strengthened or touched in by a pen. Breadth and repose were qualities secured by this mode of sketching, as we find in the early works of Pyne, Cotman, Girtin, David Cox, &c., now at South Kensington. But we have our modern representatives in Harry Hine, R. B. Nisbet, E. M. Wimperis, Thos. Huson, whose works are equal to any of those of the early water-colour artists. As before, the Council have classified the work, each member being represented in the West Gallery by a selection of his studies and sketches. Glancing at a few of these, one must notice the few choice and characteristic sketches of John Fulleylove, from Venice, Paris, and Athens. Of these the French sketches in the Luxembourg Gardens, of Notre Dame, and the four small sketches, framed, of "Les Invalides," Notre Dame, Tuileries Gardens, Versailles are the best. Henry M. Rheam sends two or three brilliant studies of heads of girls; in these the beauty of feature and the colour of the hair are cleverly handled. Frank Walton has several crisply-treated and luminous sketches from Cornwall and Yorkshire, notably "The Abbey, Rievaulx," Byland Abbey. The sketches at the Lizard are charming renderings in his sharp and finished manner. Thos. Huson's work is always conscientious, fresh and pure in colour. The sparkle and shimmer of foliage are suggested by these renderings of Welsh scenery. Mr. Huson applies his colours with a full brush, and disregards all minute details, and in this respect his sketches resemble some of David Cox's work. "A Corner of the Orchard," "Dolganog," "Early Summer," "Valle Crucis" are admirably fresh; we can see the flicker of sunlight through the foliage. Next, Walter Langley sends two very cleverly studied heads of a "Philosopher" and an "Old Soldier," both bearded and character-speaking portraits (86, 87). Very Turner-like in colour are some passages in Edwin Hayes's seascape studies (88, 102) "Hauling Nets on Board," "Squall, Padstow Harbour," "Gathering Seaweed," "Fishing Smacks," "Yarmouth," "Broadstairs Harbour," and several other sketches of sea and coast. Broad and massive in rendering are the sketches of Welsh scenery (105, 113) of E. Davies. "Rough Pastures," "November Evening," "An Old Barn," "Rough Weather—Llanberis," are full of breadth and tone. A striking contrast in treatment is seen in Joseph Knight's careful and velvety pastures and hill sides in the north of Wales—his "Sandhills," "On the Welsh Coast," "Evening" (117, 123). The original drawings in black and white for the *Badminton Magazine*, by Lucien Davis (103), are clever and spirited sketches of lady cyclists,

and their lessons in Battersea Park. Carlton A. Smith's sketches "After Rain" and "The Church Porch" (126, 128) are feelingly rendered, but a little lacking in vigour. For breadth of handling, cloud delineation, and boldness of touch, R. B. Nisbet's work leaves nothing to be desired. The sketches "On the River Tay," "A Wet Day," "Landscape," "A Summer Day, Gullane Sands, &c." (129—138) are impressive renderings of nature and sea-coast. Mr. Yeend King makes us think he is happier in his sketches than his larger works.

In the Central Gallery are placed typical examples of larger drawings and studies. Here we notice (163) an admirable view of "Hayfield," by A. W. Weedon; a charming study of "Violets," by Henry M. Rheam (165); two small finished sketches, by Thos. Pine, of Suffolk scenery (167). One of the most masterly drawings is a view of "Arundel Castle" (183), by E. M. Wimperis, the Vice-President—a broad and expansive sweep of downs, with the castle embedded in massive foliage in a valley, through which the river wends its way. The same view, or nearly so, is painted by James Orrock (230). Other small sketches by Mr. Wimperis, of "Limpfield Common," "Tooting Bee," "Corner of Common," are clever "notes," showing the same breadth and tone and vigour of light and shadow. C. E. Johnson has a view "Near Arundel," fresh and breezy. A few figure subjects claim our notice. First, John I. Richardson's "La Malade Imaginaire" (175), a dog lying on a couch feigning sickness, with a bottle of medicine in front of him; Miss Mary L. Gow's clever and bright "Portrait Sketch" of a lady seated on a couch clad in a white satin dress (177); and Arthur Burrington's study of an old woman with a red handkerchief tied round her head, taking a pinch of snuff—vigorous in handling and strong in colour (182). Edwin Hayes (174), Hamilton Macallum (178), E. H. Fahey (186) send representative drawings. As a landscape study we must place in the first rank R. B. Nisbet's very powerful piece of impressionism, "Evening" (192), a path through a thick wood. The dark masses of the trees in the twilight of a summer evening are in contrast with the golden hue of the cloudless sky, and this rich amber tone seems to pervade the scene. Mr. Nisbet is a believer in manipulative processes, especially the use of the sponge or bread in softening the darker masses of colour, which adds much to the mellow effect. Spirited also is Geo. Wetherbee's study of "The Storm" (194), a rugged pathway near the sea; trudging along against the wind are two women; the figures are well drawn. F. C. Cotman sends a view of "Wells Cathedral"; John Fulleylove a capital view of "St. Peter's from the Pincian Hill" (199); the President, Sir James Linton, sends a finished study of "Helena" (200) and a study of a head, "Bianca," delicate and refined in drawing. C. McIver Grierson, in his usual vein of humour, sends a study of an old monk leaning back in a chair enjoying a joke (208). Max Ludby's "Homeward"—a flock of sheep on their homeward journey through open pasture (217)—is clever in its reflected light. St. George Hare's "A Cherub" (225), J. W. Whympers "Haslemere" (228), and works by Claude Hayes, Henry J. Stock (239), J. C. Dolman (240) may be named. The East Gallery is representative of several groups. E. M. Wimperis (255-268) sends a series of very vigorous sketches in Wales, amongst them a landscape, "In the Wood, Yardgrove" (260), in which river, trees, and cattle are broadly treated, and two frames of sketches in Wales and Scotland. F. G. Cotman has a collection of sketches and drawings, amongst them one of "Palma Cathedral" (274), and sketches from Batcombe, Falmouth, Wincanton, &c., careful in drawing and transparent in colour. Thos. R. Macquoid has a series of drawings in pen and ink of English and Continental scenery. Somewhat mannered and commonplace are the figure-subjects of W. H. Weatherhead (288-298), in which rustic cottage life and peasant girls are introduced, and these are rendered in a rather smooth and tame manner. We must not omit the very delicately-drawn and finished flower studies of Miss Marian Chase of wild hyacinths, mignonette, primroses, orchises, almond and apple blossom (299-305); nor the series of landscapes by Bernard Evans (306-312), in which his broad massive touch and solid rendering of nature are conspicuous. His views from the South of France and Bolton Abbey are characteristic of this master's work, in which

warm autumnal tones of colour and breadth of foliage are to be noticed. Harry Hine's very interesting series of sketches in Herts and of Welsh scenery in simple washes of colour are instructive examples of sketching. Mr. Hine attains his breadth by a full pencil and carrying one tint into another while wet. Many of these resemble "lay-in" washes. His sketch of "Shafford Mill, Herts, the Village of Graveley," and "Bancroft, Hitchin" (327) are bright and clever sketches in thin washes of tint. These contrast with the finished and laboured work of Edmund E. Warren (392), and the series of John White (334) and Thos. Payne (345), in which there is often a loss of breadth and repose. J. Aumonier's bold sketches of chalk cliffs lighted up by evening sunlight, and views on the South-downs of Sussex (361-368), have colour and shadow to redeem them. The ink sketch, by the President, of a young girl with a millinery-box under her arm, waiting for a 'bus (371), is a touching study for a more finished picture. The fine series of Sussex sketches by James Orrock are full of breadth and freshness, and we note also an interesting series of figure-subjects by C. Cattermole—studies for finished works. Those interested in colour-sketches will find here a variety of method, and processes which show the extent and resources of the artist in sketching from nature.

#### SEWAGE PURIFICATION.\*

THE little volume which Mr. E. Bailey-Denton M.Inst.C.E., has just published carries the question of the land treatment of sewage up to the present time. Mr. Bailey-Denton's advocacy of land utilisation has been before the public for many years, and while he disclaims the view that he is not unfavourable to chemical processes under certain conditions, he aims "to prove that, except in those few cases where suitable soil cannot be obtained at anything like a reasonable price, or within a reasonable distance, land can still be relied on to permanently cleanse sewage at a moderate outlay, and at the same time to secure the effluent finding its way into any neighbouring stream being well within the limits of the well-known standards suggested by the Rivers Pollution Commissioners in 1876, and recognised by the Government of the day as applicable to inland towns." Mr. Denton brings strong evidence to show that the objections to sewage farms—mainly owing to the neglect of efficient maintenance of these farms by the local authorities—can be met by passing the liquid in its crude state through broken ballast, gravel, coke, or other material before it is allowed to reach the land. By the adoption of this "simple form of rough filtration the area of land can be reduced." Passing in review the objections made, the disagreeable deposition on the land of the larger solid matters in suspension, the clogging of the soil and the slower rate of filtration in consequence, and the effluvia from the soil, the author proceeds to quote the remarks of expert authorities—Mr. Baldwin Latham, Sir Robert Rawlinson, K.C.B., Colonel Jones, Manager of the Aldershot Camp Sewage-Farm, Sir Douglas Galton, K.C.B., Mr. Dibdin, Chemist L.C.C.—all of whom affirm that where sewage farms are properly managed, sewage farming is the best mode of dealing with sewage. Why sewage farming has not been so successful as it should have been is explained by Colonel Jones, who has clearly perceived that while precipitation processes are looked after by patentees and experts, the farms are left to a committee of tradespeople in the town who know little about the matter. Mr. Bailey-Denton says this want of attention and mismanagement will continue till the Local Government Board appoints inspectors to periodically inspect the sewage works throughout the country and to see that their management is efficiently maintained. As the consulting engineer at Northampton, Mr. Denton applied the scheme of rough filtration successfully to the sewage, and he now proposes this plan in all places where the land is not of the most porous description, or in those cases where the sewage discharged is greater than the land can take. The experiments of the State Board of Health of Massachusetts, described by Mr. Dibdin, show that the gravel stones give the best results and more in accordance with intermittent filtration. The slow movement of the liquid in thin films

\* Sewage Purification Brought Up to Date. 1895. By E. BAILEY-DENTON, M.Inst.C.E. London: E. and F. N. Spon.



over the stones open to the air caused the organic nitrogenous matter to be removed or oxidised to the extent of 97 per cent., as well as 99 per cent. of the bacteria in suspension. Mr. Dibdin also records the experiments at Crossness with filters, and shows that for foul waters sand was too fine and burnt ballast too coarse, while coke breeze was found the most efficient and cheapest material. Mr. Denton first describes his scheme at Northampton, where 205 acres have been acquired for the purpose, and he shows by a plan and section of the filter tank, how the depositing tanks and filter chambers are arranged. By this plan the author skims off the coarser floating solids, and rough-filters the liquid before admitting it to the outfall sewer. This work has been carried out by Mr. Gibbons, the borough engineer. The surface of the sewage, as it comes from the town, is skimmed at the cross walls of the tanks, and afterwards passes through penstock openings into the bottom of the filter chambers, which run longitudinally across the tanks in the centre. The liquid here rises up through the filtering material, and passes over the weir into outfall conduit to farm, which runs centrally between the filters. The tanks are in duplicate. After use the contents remain quiescent for a few days, the supernatant or clear water on top, after passing through a receptacle containing coke or ballast, is discharged into the effluent conduit. The liquid sludge at the bottom is raised by pumps, and the solid is mixed with town ashes and sold to farmers. The filtering material in the filter chamber consists of broken bricks or ballast, and when the tanks are alternately emptied this ballast is automatically cleaned by the head of water lying over it, which washes off the arrested filthy matter into the pump-well, and thus the filtering material is aerated between each application of sewage. The process is said to act satisfactorily. The other accounts of works executed by the writer's firm at Dewsbury, Forfar, Scotland, Abingdon, Berkshire, Great Malvern, and other places are interesting, and show that the system of intermittent filtration, when properly applied and managed, is successful, and the crops produced excellent. Plans of the works are given in each case. We cordially draw the attention of all local authorities interested in sewage purification to the true and natural system advocated in this volume.

#### BUILDING SOCIETIES.

THE first annual report by the Chief Registrar of Friendly Societies on the proceedings of the registrars under the Building Societies Acts has been issued as a Parliamentary paper. It states that at the passing of the Building Societies Act, 1894, there were on the register the names of 4,486 societies enrolled under the Act of 1836. Communications were addressed to all these societies, and it was ascertained that a large number of them had ceased to exist, most of them having terminated by effluxion of time, without any formal dissolution. The number at present on the register is 963, of which 400 are in Lancashire and Yorkshire, and 217 in Middlesex and Surrey. By section 25 (2) of the Act of 1894, the Act of 1836 will, on August 25, 1896, become repealed as to all societies certified under it after the year 1856, and such societies will at that date cease to have any legal organisation whatever unless they become incorporated under the Act of 1874, or under the Companies Acts. Details are then given as to the proceedings of the registrars during the year 1895, and the Chief Registrar says, in conclusion:—

"It will be seen that already, during the first year the Act of 1894 has been in operation, nearly all the special provisions it contains have been put in use, and it has been found to be workable in every respect.

"More complete information has been placed at the disposal of the members as to the transactions of the societies to which they belong; the production and audit of accounts have been enforced; the special provision for investigation, on oath, into the transactions of a society has been made available; and societies in difficulties have been either wound up expeditiously or helped to right themselves. As the benefit of these and other enabling clauses of the enactment comes to be better known, it is probable that they will be more frequently used. Except in rare cases the registrars cannot act of their own accord, but have to be set in motion by the members of societies. If the members are content, as in too many instances it would seem that they have

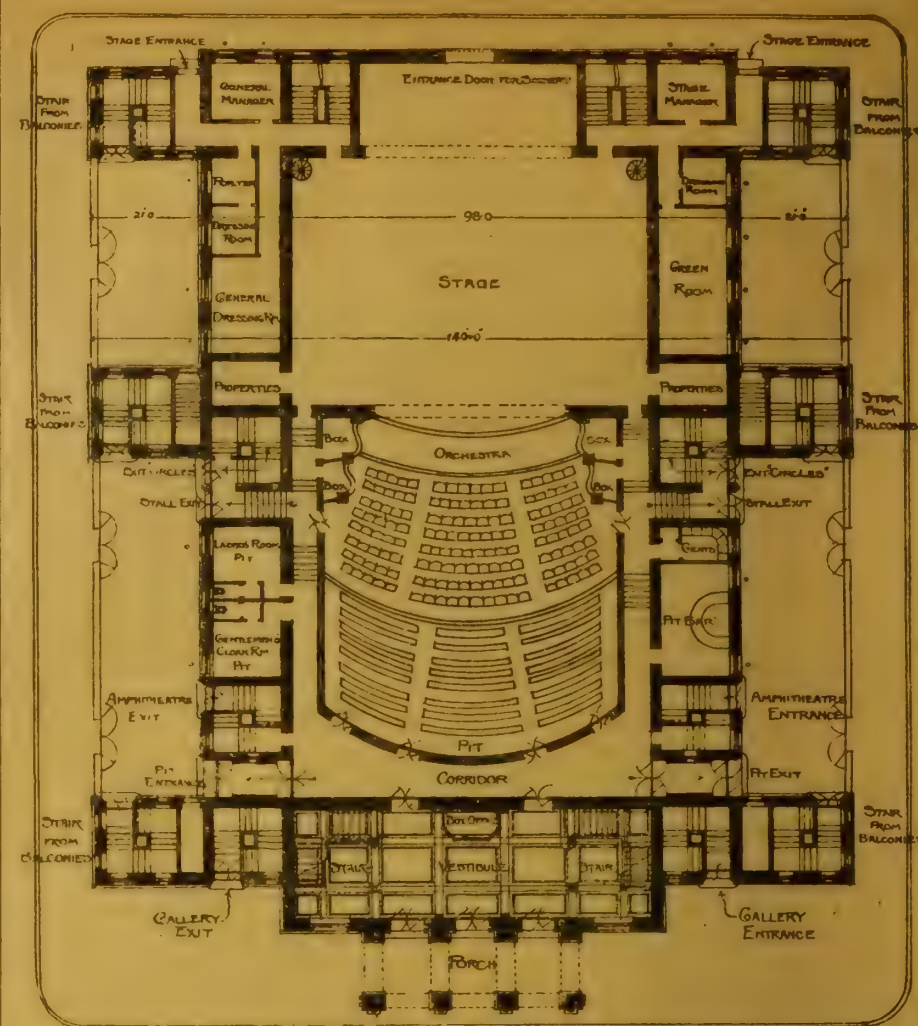


FIG. 1.

heretofore been, with meagre and insufficient information, with ill-kept and unsatisfactory books, with loose and irresponsible management, they will have themselves only to blame when the inevitable loss arises. It is not probable that any form of accounts could be devised which could not easily be made to cover fraud by the dishonest ingenuity of the fraudulently disposed.

"However simple and searching the annual return may be made, there must, of necessity, be many loopholes of which an astute manager might avail himself. If the greater stringency of the enactments devised by the Legislature to assist the members in the conduct of their affairs should lead them to rely upon the provisions of the statute rather than upon their own vigilance, it would do more harm than good. All that the Legislature has done, or can do, is to place within their reach methods of supervision and control, and all that the registrars, as executive officers, can do, is to carry out the provisions of the statute in a zealous and sympathetic spirit."

#### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XX.

By ERNEST A. E. WOODROW, A.R.I.B.A.

HAVING dwelt upon what is necessary to make a concert-hall successful as a place in which to see and hear, I must not leave this part of my subject without referring to what is necessary to make it a safe building for the accommodation of the public.

Within the last few weeks there has been published a paper by Mr. A. H. Young, of Edinburgh, in which he has put forward what he terms his solution of what is necessary to attain this important and much-desired end. He has adapted a system for a theatre, but as he points out that the same is applicable to a concert-hall, I take the opportunity of referring to his remarks, and producing some diagrams from his pamphlet.

Mr. Young's scheme consists in creating a series of outside and open-air balconies on each level of the auditorium, running the entire length

of the same, with exit-doors leading directly from the audience on to the balconies. The ground is reached by a series of staircases leading from the balconies to the ground.

One would gather from the explanation of this "system," as Mr. Young terms it, that he is under the impression that the plan has never been adopted before; but some twelve years or more ago, Mr. Baes built the Flemish Theatre, Brussels, and in Figs. 3 and 4 I reproduce the plans, showing how he treated the external staircases in his building.

In both examples external staircases are made to do service for exits; in both examples these staircases are approached from each level, and discharge in an open balcony, and eventually reach the ground. The system, no doubt, is an excellent one, provided one could be sure the public would avail themselves of these extra exits; but from some years' experience, I am aware that it is quite the exception for the public to go out by any other way than that by which they enter. It is almost an impossibility to make a crowd go out peaceably by any other than the entrance-doors, and in a case of panic the difficulties would be multiplied tenfold, and extra exits be of no avail. Mr. Baes argues that the public would become familiar with the external balconies and staircases by using the balconies in summer for promenades. With use and familiarity the value of the scheme would doubtless be greatly augmented.

The greatest safeguard against losing the value of exits is making them all entrances as well as exits. It prevents them being blocked, obstructed, or locked, and it acquaints the audience of their very existence.

The superiority of Mr. Baes' plan over that of Mr. Paterson, who has put Mr. Young's conceptions into a workable form (as in the plans, Fig. 1 and 2), is obvious, because in Mr. Paterson's plan the audience have to pass by the doors by which they have entered (notably in the gallery) in order to reach the emergency exits, and it is only natural that they would go through the doors by which they came in, rather than pass on



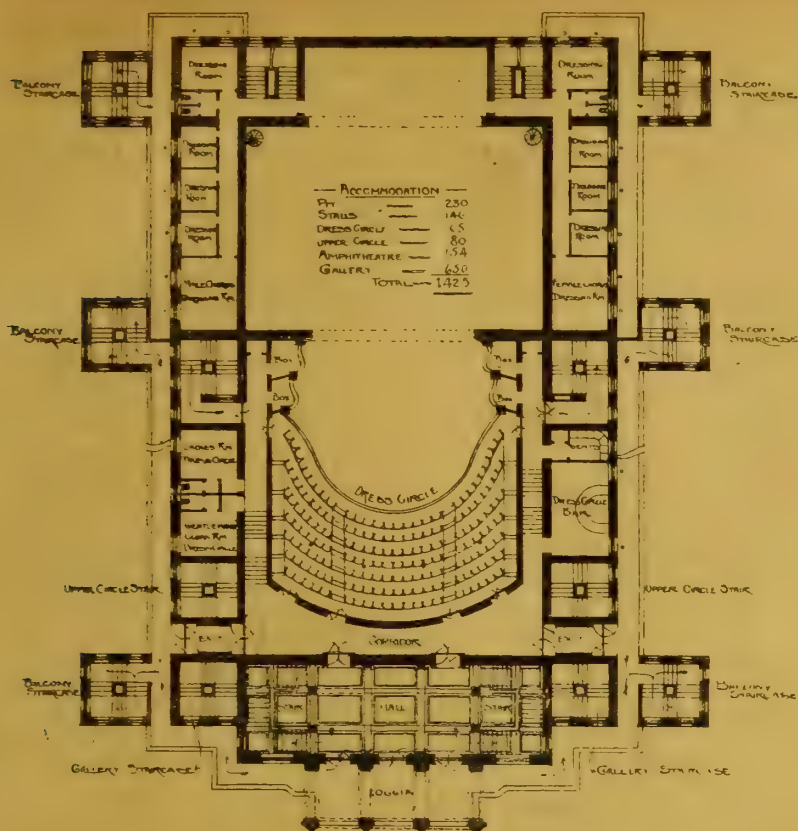


FIG. 2.

in search of other means of egress; but, as I have said, the principle is good if you could only educate the public so that they would avail themselves of the provisions made. The external balconies alone are most valuable additions to

the audience were aware of the exits, then the system would be an immense advantage over the present one of providing two exits for each tier; but the difficulty arises in getting the public to go through the extra exits.

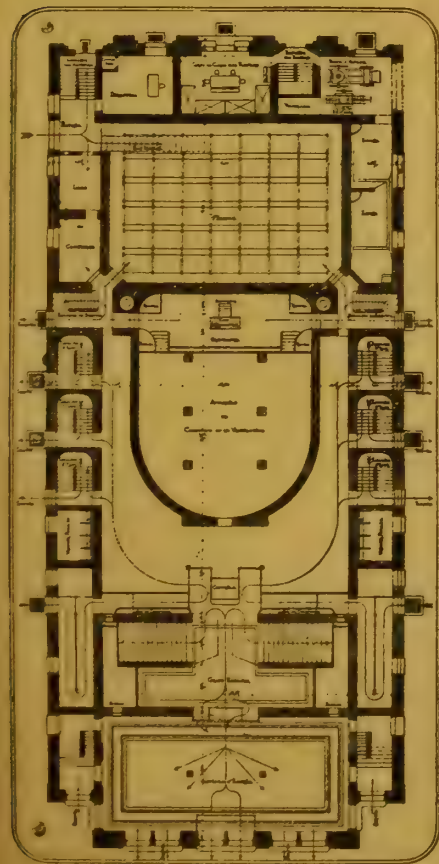


FIG. 3.

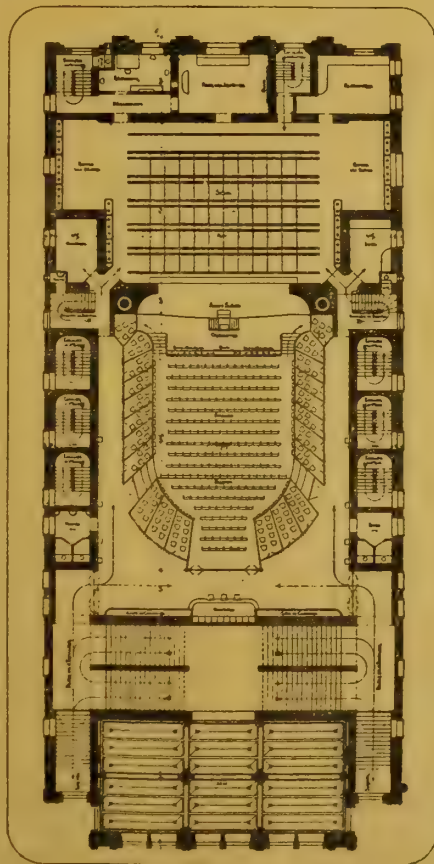


FIG. 4.

the safety of a building, as they afford a place of refuge from a burning building, from which external aid can easily reach the people.

It is quite true, as Mr. Young states, that if

One might further comment upon Mr. Paterson's interpretation of Mr. Young's "system" by drawing attention to the extravagant amount of space which is required in order to carry out the

scheme, making it prohibitive to any manager in the outlay necessitated by the purchase of so much additional land whereon to erect the building, which, after all, would only seat such a small number as 1,425 persons; but I look upon these plans as mere diagrams to illustrate the "system," which, however, Mr. Baes has carried out in a far more practical and economical manner in the Flemish Theatre, Brussels (Figs. 3 and 4).

Again, in Figs. 1-2, to approach the stalls the way of access shown is by traversing the pit corridor, passing the pit bar on the one side and the pit urinal on the other, unless, indeed, the occupants of the stalls use the same staircases as the dress-circle and descend again by the circle extra exit staircase. It is a question if this method would meet the approval of the London authorities. A point is made that the pit is on the street-level; but it is well known that a building is far safer where the height of the gallery from the pavement is reduced by placing the area below the street-level, there being less danger in ascending from the pit than in descending by a long staircase from the gallery. All theatrical architects agree on this important point.

It is only in towns where municipal assistance is afforded that such a scheme as Mr. Young's would be practicable. It is to be regretted that this is the case, and that private enterprise and speculation should overrule the safety of the public in a place of entertainment. There are many of the theatre regulations of the London County Council that are drawn up for the purposes of theatres which are equally applicable to concert-halls, and are enforced by the authorities to this class of building. A short *résumé* will not be out of place while speaking on this subject of safety. In large concert-halls the site question enters as stringently as in the case of theatres—that is to say, one half at least of the boundary of the site must abut upon thoroughfares of a given width, as specified in the regulations. A concert-hall must be a building by itself, and not directly over or under other premises. I have already dwelt upon this point, showing how the custom abroad differs from the custom in London.

The regulations dealing with the widths of entrances and exits is governed by the number of the audience. Each tier must have two exits—that is to say, an entrance and an exit, which, in my opinion, should both be used as entrances as well as exits. The number of tiers in a concert-hall must not exceed those laid down by the regulation of the L.C.C. for a theatre—that is to say, the maximum of three tiers, including gallery, is all that is allowed in London. The height of air space over the gallery and between the first balcony and pit level is regulated by the same rules, and where the area level is below the street, the architect is restrained by Rule 9, which does not permit the floor of the building to be placed at a greater depth than 15ft. below the street-level. Retiring-rooms for the artists must have their separate entrances; but it has not been the custom of the London County Council to insist upon this in minor concert halls. In matters of detail, such as size and rise of steps, the widths of landings, lengths of flights, provision of hand-rails, &c., the same rules apply to concert-halls as to theatres. The widths of gangways is regulated by the same rules, and these are always enforced, even in the smallest concert-halls.

Gas arrangements as described in the 24th regulation stand good for the buildings we are now discussing. The manner in which doors are hung, and the description and pattern of bolts, provision of barriers, &c., are defined in the 25th regulation.

With regard to fire-protection, the larger halls are treated the same as the theatres; but the smaller ones are dealt with according to the merits of the case. In all cases the lighting and exit notices are always insisted upon. In short, wherever the London County Council regulations as to theatres can be made applicable to concert-halls, they are enforced. I will not dwell in further detail upon these points, as I have already described in full the necessity and working of each of these regulations as applied to theatres in my articles upon that subject which have appeared in the columns of the *BUILDING NEWS*, and I have also spoken fully upon many of the points in this series when they have had special reference to concert-halls and assembly-rooms.

Alterations are being made to St. Jude's Mission Church, Plymouth, embracing the ventilation, which will now be carried out on the Boyle system.



# WARMING BUILDINGS BY HOT WATER.—I.

THE LATEST INFORMATION.

By FREDK. DYE, Author of "Hood on Warming Buildings," &c.

THE intention of these articles is to make known the latest principles and practices relating to hot-water works for warming buildings, and particularly to describe some new systems that are little known about at present. These systems are not merely theoretical ideas, but practical and largely adopted, though perhaps more in America than England. American practices, by the way, deserve every consideration, for they are the outcome and result of an experience many times greater than our own. In that country a radiator fulfils the purpose that a fire-grate does here, and this, of course, means that hot-water engineering is in great demand, and most widely practised. Their climate also makes, if possible, a higher degree of skill and care necessary to secure a given effect.

Briefly, the information to be given will consist first of some details connected with the old style of two-pipe system—such as the proportionate sizes of mains, sub-mains, branches, and radiator connections. There is more known in regard to these details than was the case a few years ago, and they go far to insure good and equal results.

Secondly, a description of the one-pipe, or simple circuit system—a system that has no equal for horizontal works where the whole of the radiators are on one or two floors, and the floors are of large extent. These conditions apply to most banks, restaurants, lecture-halls, some hospitals, and similar institutions and places. The last apparatus erected on this system by the writer is in Lloyd's Bank, Ltd., Law Courts Branch (near to the office of this journal). There are 70 radiators, and no other system could be relied on to give such regular results from the first trial as this has. Regular and equal working is one advantage of this system; while another is the reduction in the quantity of pipe required. It is undoubtedly the most simple form of apparatus yet known.

Third, the "overhead" system," by which the

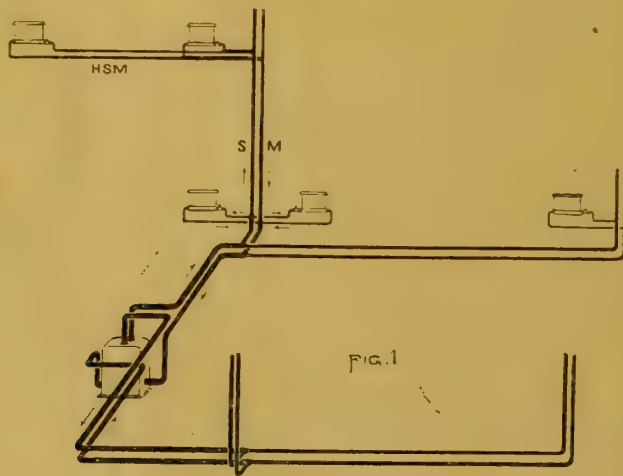
boiler, and the water of the first sub-main is the last to return there. The graduation in the sizes of the mains—the flow decreasing and the return increasing—allows every branch main to have an equal share of the hot water, and be properly relieved of that which is cooled.

For very large apartment buildings there have recently been instances of the heated water to radiators being circulated by the aid of a pump. This entails the installation of an engine-pump and its subsequent maintenance; but it admits of the apparatus being carried out with pipes of a little smaller size, less in quantity, and an almost total disregard of rise and fall, which is so necessary for a convective circulation. This system needs no other explanation, as no important or peculiar principles are involved.

The two-pipe system.—Fig. 1 illustrates what may be termed a typical example of the old two-pipe system, the system that is most largely practised for general purposes; but not having the advantages of other plans under certain conditions. In this, all connections are flow and return, whether they be mains or branches, and the result is that the hot-water proceeds direct to its work, and then immediately returns to the boiler. Taking the sub-main, marked S M in the illustration, for example, a proportion of the heated water passes up this flow-pipe, and after passing through the radiators joins the main return as shown. It then proceeds direct back to the boiler to receive more heat and circulate out again.

On this account there is no reason for carrying a main service in its largest size for the whole of its length, and it may be reduced as it passes each branch. The reduction must bear a fixed relation to the amount of work disposed of, and the amount of work yet to be done. It is the same with the sub-mains and branches: these start with a pipe that is known to be of a full size for the total work to be done; but there is no occasion to continue with this size pipe after passing some of the work.

In recognition of this, a table of sizes for pipes, whether for the largest mains or the smallest branches, becomes an important feature in calculating for this work. Such a table is largely



mains in the basement are reduced in number and almost entirely done away with. This system is well adapted for the large type of City buildings that are let out in offices. It is quite recognised now, that the basements of such buildings can be fitted and let as business offices, and realise a higher rent than some of the floors above. In fact, for general convenience, the basement is only excelled by the ground and first floors, even in buildings fitted with lifts. Under these circumstances it is highly desirable that no network of mains or other pipes exist throughout the basement floor, and the "overhead" system is the best in effecting this.

Lastly, an arrangement that might be styled "The graduated duplicate main one-pipe system." This plan gives very good results when there are a number of vertical sub-mains carried up in the different angles of a building, all fed from horizontal mains in the basement. There is total immunity from short circuit, and the most equal results possible are obtained. It is a plan whereby the water of the furthest sub-main (presumably the coolest water) is the first to return into the

based on the radiating surface the apparatus has to keep hot, as radiators are (or should be) now made to recognised proportions—that is, to hold a quantity of water in ratio with their surface.\* A table based on heating surface alone, however, leaves much to be guessed, and the better plan is to have tables giving sizes of branches to serve certain areas of radiating surfaces, and then to have a table giving the sizes of mains to feed a certain number of branches of various sizes. The following tables are based on the radiating surface, being radiators, and not hot-water pipes. The latter, particularly the 3in. and 4in. sizes, hold such a much larger quantity of water for a given surface, that the results are varied to some extent.

In this table it is understood that every branch to a single radiator is of the same size pipe as the radiator connection. In other words, if a radiator has, say, 40ft. of surface, it will be tapped for 1in. pipe, and the branch serving it will be 1in. pipe

\* The tables are, therefore, not applicable if ordinary hot-water pipes are used instead of radiators.

throughout, both flow and return. The stop-valve and union will be lin., also with a clear way through, and this way, or passage, to be preferably a straight bore. If any branch goes to serve two or more radiators, then the next table must be consulted as it becomes, for purposes of calculation, a main. Such a branch is marked HSM on the illustration. The first radiator on this horizontal service has branch connections of the size given in the following table, and so has the second, for the last radiator on such a service is treated as being connected out of a main. It will be seen that part of the service is of larger pipe—viz., that part which has two radiators to serve—

SIZES OF RADIATOR CONNECTIONS AND RADIATOR BRANCHES.

Surface of Radiator.	Size of Radiator Connection, Service Pipes, and Stop-cock.
Up to 16ft. ....	2 in.
16ft. to 48ft. ....	1 1/2 "
48ft. to 100ft. ....	1 1/4 "
100ft. to 150ft. ....	1 1/2 "

This table, like all those connected with hot-water works, will bear variation under special conditions. If a branch to a single radiator extended an unusual distance, say over 30ft. horizontally, it would be well to give it a size larger pipe, though the cock and connections at the radiator need be no larger. The object of the larger pipe is to get the heated water to the radiator more quickly, and it might not be needed if the flow-pipe was carefully covered to prevent loss of heat. These sizes may be considered to apply to the ground and first floors of a building; higher floors can have radiators with 15 to 20 per cent. more surface with the sizes of branches given:—

SIZES OF MAIN SERVICES.

Main.	Branches.
1in. will serve	two 3/4 in.
1 1/4 in.	three 1in.
1 1/2 in.	five 3/4 in.
1 3/4 in.	three 1 1/4 in.
2in.	four to five 1in.
2 1/2 in.	three 1 1/2 in.
3in.	four to five 1 1/4 in., or equivalent of 1in.
3 1/2 in.	two 2in.
4in.	three to four 1 1/2 in., or equivalent of smaller sizes.
4 1/2 in.	one 2 1/2 in. and one 2in.
5in.	three 2in. (barely), or equivalent.
5 1/2 in.	two 3in. and one 2 1/2 in.
6in.	four 2 1/2 in.
6 1/2 in.	six to eight 2in.

This table will also admit of judgment being used in accordance with the conditions. If there is doubt, it is decidedly best to err on the side of putting one size larger pipe, not smaller. The sizes given, though, are for horizontal mains. When they are vertical, a little more work can be put to a given size of pipe.

With a table in which the sizes of all pipes are arrived at by the radiating surface to be dealt with, the figures run:—

Total Radiating Surface.	Size of Horizontal Mains.
Up to 100ft. ....	1 1/2 in.
" 250ft. ....	1 1/4 "
" 500ft. ....	1 1/2 "
" 850ft. ....	2 "
" 1,200ft. ....	2 1/2 "
" 2,200ft. ....	3 "
" 4,000ft. ....	4 "

This table does not agree exactly with the previous one; but allowance has to be made for the previous one not being likely to have the utmost radiating surface on all its branches. With this table also a little more surface can be added to a given size of pipe if the mains are vertical.

## THE TIMBERS OF AUSTRALASIA.—IX.

THE HARDWOODS: VI.—TASMANIA.

TASMANIAN blackwood (*Acacia melanoxylon* —Nat. Or. *Leguminosae*) is not always, perhaps not generally, regarded as exactly a hardwood; but that fact is due less to its character than to the uses to which it is principally put, which, in the main, are for furniture and for building construction of a more or less ornamental kind. Its specific gravity is .664 to .777, and the weight in pounds per cubic foot of the dried wood varies from 41 to 54, while in point of strength it holds by no means a contemptible position as compared with the iron-barks and gums. Various experiments made with this timber in Victoria, to ascertain its resistance to breakage, have shown most satisfactory results. Perhaps the most important



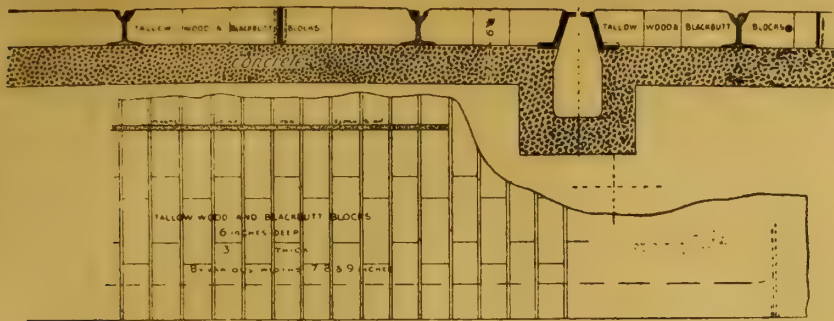


FIG. 2.—Section of Cable Tramway, King-street, Sydney, Showing Tallow-wood and Blackbutt Blocking.

were those made by the Victorian Timber Board in 1884, when blackwood from Tasmania, as well as from various parts of Victoria, was specially examined, and when, although the breaking weight of the island timber proved somewhat less than that of the continental, the amount of deflection at the point of rupture was likewise smaller. The results of the trials may be summarised as giving the strength in transverse strain of blackwood as equal to that of Eucalyptus timber of middling strength approaching that of American white oak, and surpassing that of the New Zealand Kauri pine (which will be dealt with in due course). The tree is found extensively on the river flats and in the moist forest valleys, attaining an extreme height of 100ft., with a diameter of 36in. It derives its ordinary appellation from the very dark colour of the mature wood (which resembles Italian walnut); but in Southern Tasmania it is known by the

back" or "silver-grain" blackwood, and are much sought after, fetching, of course, a higher price than the plainer wood. Sometimes a small portion only of a tree shows the fiddle-back grain. Though very tough, the wood works easily, but gradually becomes extremely hard, and it can be used a few months after felling without danger of its shrinking. Blackwood is considered by not a few persons to be the most valuable of all the Australian timbers on account of the large variety of uses to which it can advantageously be put. It is highly esteemed for bridge-building, for railway and other descriptions of carriage-building. As previously mentioned, it is one of four colonial timbers specially recommended for railway carriages by the Victorian Carriage Board, for ship and boat-building (for bulwarks, capstans, stem and stern-posts, ribs and rudders), for wheelwrights' work (for naves of wheels), for organ-building and pianoforte-making (sound-boards and actions), billiard tables, and all kinds of solid furniture, and heavy joinery and cabinet work, gun-stocks and tool-handles, picture frames, and wood-carving. The exceedingly fine pulpit and stairs in Decorated Gothic in the (Protestant) Cathedral of St. Paul, Melbourne, are executed in this grand timber, and form an admirable example of its completely satisfactory employment. The work would be no discredit to any English cathedral. The wood is likewise the most suitable of all that are indigenous to Australia for oil casks, for which it is largely used, splitting into staves, 6in. by 3in., and 6ft. long. Samples of blackwood from both old and young trees were sent to the Indian and Colonial Exhibition in London, the former being made into joiners' specimens, the latter into casks. The result was reported by Mr. Allen Ransome as follows:—"The figure of the old-growth wood is very fine, and the surface left by the cutters all that could be desired. The casks also proved a complete success. The more ornamental logs are exceedingly beautiful, and should fetch a high price in this (the London) market, where they could be used to advantage in place of the best Honduras mahogany\*, while the less ornamental logs would serve for the higher class of joinery-work, such as counter and other shop-fittings."

Messmate, or Tasmanian stringy bark (*E. obliqua*), attains in the island colony a size and excellence to which it is a stranger on the Australasian continent. Mr. James Mitchell, D.A.C.G., of Sydney, measured, in the vicinity of the Cam River, near the north coast of Tasmania, the branchless broken stem of a messmate tree, 200ft. high, with a girth of 64ft. at 4ft. from the ground, and containing little less than 200 tons of solid timber, although the weight of the wood is much less than that of the hardwoods generally, averaging about 54lb. per cubic foot. The usual height of the tree is seldom much less than 300ft., and the stem diameter about 10ft. Messmate is the most gregarious of all the Eucalypts, and is a quick-growing tree, and the bulk and best of the timber is obtained from very poor soil in mountainous regions. Though exceeded, in various instances, in hardness, it is a most useful timber for general purposes; and—owing to the length and straightness of the stem, and the unusually fissile nature of the wood, which enables it to be easily worked, its use is very varied and extensive, especially for the more ordinary purposes of building, such as rafters, scantlings, boards, &c. It is excellently adapted for telegraph and scaffold poles, while for shingles

\* In Australia, blackwood is considered an even better substitute for walnut. For such purposes as the cases of chamber-organs, it seems to me quite unsurpassable.—D. L.

(as well as for many purposes connected with palings and fencing) it is probably unsurpassed. A valuable paper on "The Strength, Durability, and Value of the Timber of the Blue Gum of Tasmania and Some Other of the Eucalypts for Ship-building, &c.," read by Mr. Mitchell before the Royal Society of Van Diemen's Land, and published in the *Proceedings* of that body, Vol. II. page 121, contains an exhaustive table of the results of his experiments with messmate and other Tasmanian timbers, comparisons between which and the results of precisely similar experiments upon European and Indian timbers are afforded by the tables published alongside of it, and quoted from Professor Barlow's "Essay on the Strength and Stress of Timbers," and those by Captain H. C. Baker, published in the article "Timber," in the *British Encyclopædia*. The gratifying results of Mr. Mitchell's investigations have been since confirmed by the later experiments of Baron von Müller and Mr. J. G. Lüthmann, and by those of the Victorian Timber Board; while the durability of messmate was further demonstrated practically on pulling down the old court-house at Hobart, when, notwithstanding the sea-air, the timbers, 40 years old, were found to be as sound as when put in. Messmate wood is light in appearance, and of a warm brown tint, and near the base of the trunk it often assumes a beautiful wavy figure, which well adapts it for furniture, and is very ornamental. Of all the stringy barks, the Tasmanian messmate bears the palm for majestic height and stem-girth, freedom of grain, fissile properties, and general utility, together with the undoubted advantage of being obtained in unlimited quantities at the water's edge, in the immediate neighbourhood of fine safe harbours and navigable streams.

Little need be added to what has already been said, under the head of "New South Wales," of the mountain ash of that colony (*E. Sieberiana*), which in Tasmania is called "gum-top," or to the particulars of the manna-gum (*E. viminalis*), for which the reader may be referred to "South Australia." But although the blue-gum (*E. globulus*) was noticed somewhat fully among the timbers of Victoria, a few supplementary observations must be made on the Tasmanian product. Tasmanian blue-gum is considered to make the very best of all planking for ships' bottoms. It possesses the property of swelling under water to such an extent that it becomes a matter of difficulty to find the seams when the vessels are put upon the slips for coppering. But much judgement is required in selecting the timber. Both the heartwood and the sapwood must be rejected, as both are worthless for the purpose, and soon decay. The true serviceable blue-gum must come from the circumference of the tree—about midway between the bark and the centre. In his extremely valuable work, "Useful Native Plants of Australia," Mr. J. H. Maiden gives a number of tables showing the results of experiments with Tasmanian blue-gum, made by Mr. James Mitchell, Mr. Thos. Laslett, Timber Inspector to the Admiralty, London; Baron von Müller and Mr. Lüthmann, and the Victorian Timber Board—all of which go to show the exceptional value of this timber, especially for ship-building purposes; while four samples of it gave Mr. F. A. Campbell, C.E., as published in the *Transactions of the Royal Society of Victoria*, 1879, the following values in pounds per square inch for the tensile strength: 24,500, 24,000, 29,800, 26,700. The timbers he experimented on, Mr. Campbell found to be exceedingly good, well seasoned, beautifully clean, and very straight in the grain. The tree grows rapidly in Tasmania, attaining, in the moist, rich ground, a diameter of 24in. to 30in. in twenty years; while the colossal dimensions it occasionally reaches are illustrated by a recorded specimen which, with an estimated height of 330ft., measured actually 78ft. 9in. in circumference at the ground, and 71ft. 9in. at six feet higher up the stem. The sizes of timber obtainable from such trunks may be imagined. Of other timbers already described, though they may thrive exceptionally in Tasmania, it is unnecessary to add to what has previously been said; while the blueberry ash (*Eleocarpus cyanus*—Nat. Or. *Tiliaceae*), an exceedingly tough wood somewhat resembling English ash, and recommended for wood-engraving; the Tasmanian tea-tree (*Leptospermum lanigerum*—Nat. Or. *Myrtaceae*), a small tree possessing antimalarial influence, and with heavy, dark and durable wood (of which the blacks make "goyjums," or kangaroo spears, after heating the material to

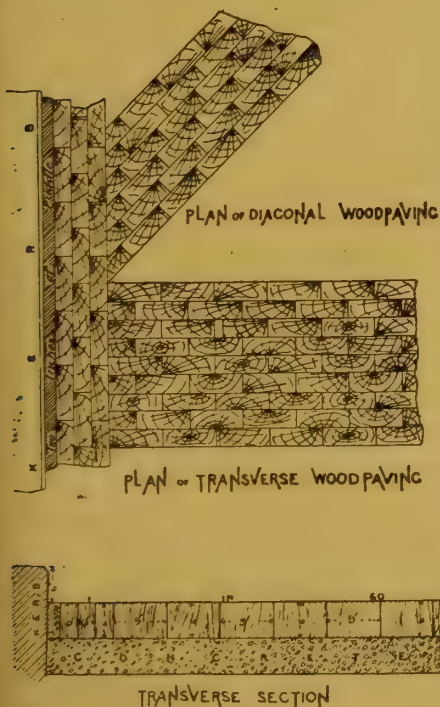


FIG. 1.—Showing Quick-expansion Joint of Puddled Clay and Concrete Foundation.

extremely inappropriate name of "lightwood," on account of its lesser weight as compared with the Eucalypts. The discovery and use of blackwood (which must in no way be confounded with blackbutt *Eucalyptus pilularis*, a totally different timber) may be dated back at least as far as 1840, when many of the Tasmanian pine woods were opened up by the convicts at the terrible Port Macquarie, and enormous quantities of this valuable wood have been exported from Tasmania to New South Wales, Victoria, and South Australia during the last half-century. The wood is close-grained, with some variety of figure, bends excellently under steam without warping or twisting, cuts into veneers that are scarcely inferior to American walnut; ebonises well, and takes a splendid polish. The figure is oftentimes extremely beautiful, more especially in the butt logs (though these are by no means common). Such logs are called "fiddle-



bend it), and the bottle-brush, or stonewood (*Callistemon salignus*—Nat. Or. *Myrtaceæ*), a particularly hard and close-grained timber, may be dismissed with brief mention. Slabs of the latter, however, were exhibited at the London International Exhibition of 1862, and now weigh respectively, 56lb. and 60lb. per cubic foot. The wood varies in colour from a uniform drab to a dark red, and often shows a very pretty grain which looks well under polish. It is fairly easy to work, dresses admirably, and is considered very durable underground. The tree, however, rarely exceeds 50ft. in height and 24in. in diameter.

Disappointment is said to have been experienced in England with Tasmanian timbers, which in some cases seem to have been exported from Australia as the produce, not of the Island Colony, but of New South Wales; and the fraud, so practised on the respectable members of the timber industry in the mother colony has, not unnaturally, excited indignation. I am strongly of the belief, however, that any dissatisfaction that may have been felt has been caused far less by the inherent qualities of the timbers than by the careless methods of their handling, and I find my opinion borne out by one of the highest authorities on the Tasmanian timber trade—viz., Mr. George S. Perrin, the Victorian Conservator of Forests, who has several times been mentioned in the course of these articles. Mr. Perrin has personally explored Tasmania, and is familiar with her vast forest resources from one end of the island to the other, and ten years ago, prior to preparing a special report upon the subject for the Government of the colony, he forced his way through the dense jungle of the then wild western country, exploring and charting mountains, localising nameless lakes, and discovering enormous tracts of the splendid Huon River pine which were previously unknown. The difficulty with Tasmanian timbers and the necessity for a special treatment of them are no new things: they date back for five-and-forty years at least, for in 1851 a well-known timber authority and shipbuilder of Hobart, Mr. John Walton, called attention to the matter in a letter to Mr. Mitchell, which was embodied in the *Proceedings of the Royal Society of Van Dieman's Land*, 1852, though his valuable suggestions were never acted on, through their not being brought prominently before the sawmilling interest of the colony. The simple fact is this. The sap and juices of the timber trees of Tasmania are present in much greater abundance, owing to the moist climate and the excess of rainfall, than in the corresponding trees of the continental colonies, where more arid conditions of growth prevail; hence there exists a necessity for adopting greater precautions to remedy the defects in the timber caused by this superabundance of sap in the tree, and such precautions are so seldom taken. The greatest failing with all Eucalypt timber (though the iron-barks, tallow-wood, and jarrah nearly approach an exception) is its liability to rents and fissures caused by shrinkage, and to this defect Tasmanian timbers are peculiarly liable, in consequence of their rapid growth, the freedom of their grain, and the moistness of the localities from whence they come. Up to a certain point it should be understood—and the fact (which is thoroughly recognised throughout Australia) may here be specially accentuated—these fissures and rents do not vitally affect the timber or impair its strength. Moreover, as all Australian sawn hardwoods will invariably shrink during the process of drying to a greater or less extent, according to class, but always on the side nearest the heart, the defect (if it be such) can be reduced to a minimum by cutting for all classes of work (excepting large squares with the heart in the centre) from the back of the log, and not on the quarter—a matter which architects and engineers would do well to make a note of—and, further, by painting (or preferably tarring) the surface prior to placing, so as effectually to prevent the incursion of wet into the fissures, that being the greatest enemy to be feared. Mr. Perrin formulates a variety of recommendations, in order that Tasmanian timber may be felled, “broken down,” and placed upon the market in a dryer condition than is usually the case. The measures and precautions recommended concern chiefly, of course, the timber-getters and exporters. The more important of them, however, may here be briefly mentioned, in order that English and other importers and users may be the better armed against imposition, or may, at all events, be able to represent to their purveyors what ought to be

done to insure supplies that can be relied on, and to show that they (the consignees and users) are a little more enlightened on the subject than they used to be. Two of these recommendations are—the cessation of the system of cutting up timber at the mill in a perfectly green state, and soaking of the felled log in sea-water, where possible, for at least a month. But by far the most important is the precaution first recommended by Mr. Watson, and now emphasised with double force by Mr. Perrin—viz., the “ring-barking” (or severing the bark right round the stem down to the wood) of all trees at least three months before they are felled, or, as Mr. Watson called it, “killing them standing.” Upon this point I quote the Victorian Conservator's own words. He says:—“I attach the utmost importance to this question of ‘ring-barking’ all the trees intended for the saw, as the tree in its perpendicular position is more rapidly drained of its sap and natural juices when once the bark is cut through to the wood, and so they descend by the natural channels, instead of allowing the log to remain on the ground in a horizontal position, and the sap and acids to percolate slowly into the woody tissues and remain there, decomposing and gradually rotting the log, if left long enough. This question of ‘ring-barking’ is so important that it cannot be too strongly impressed upon the mill proprietors of the colony.”

But there is still another matter. The whole of the Tasmanian Eucalypts, without exception—and here again Mr. Perrin is my authority—are liable to the attacks of both land and marine insects; and when, therefore, these woods are employed for important marine constructive works, such as piles, it is absolutely essential that some protective measures should be taken to preserve the timber from, say, a few inches above high-water mark to a few inches below the mud-line; experience going to prove that the more destructive of the marine insects labour only in the water, and not in the mud at the bottom. Hence the necessity for some coating or sheathing to all Tasmanian timbers so used, from the mud-line to the water-line, to protect it from the ravages of the *Teredo navalis* and other of this objectionable insect's predatory congeners. Even in Sydney, at the present time, the ironbark piles used in the construction of the new wharves at Circular Quay are, by way of precaution, being sheathed with Müntz metal, and a similar course would, no doubt, solve this difficulty with the hardwoods of Tasmania. Given the above precaution, together with those advised by Mr. Perrin, and I believe that little more would be heard of the inferiority or untrustworthiness of the Tasmanian timbers. I am strongly of opinion that such unfavourable reputation as they may have acquired is due solely to the apathy, carelessness, or dishonesty of men who are anything but a credit to a great industry such as the timber industry of Australia; and that when the splendid hardwoods and other timbers furnished by the enormous forest resources of “the Garden of Australasia” are put upon the market in their best condition (instead of in an inferior state, and as the make-believes for other timbers), and are fairly tried upon their own merits, the best Tasmanian hardwoods will take no mean position among the exceptionally valuable timbers of Australasia.

DE LIBRA.

(To be continued.)

#### THE ANGLO-NORMANS IN ULSTER.

A VERY interesting paper was read last week at the Omagh meeting of the Royal Irish Society of Antiquaries on “The Anglo-Normans in Ulster,” with chief reference to their ecclesiastical and military architecture. Commencing with a brief reference to the Norman conquest of England and Wales, of which the Anglo-Norman irruption into Ireland was the historical sequel, carried out on ignominious lines, the paper went on—The closing decades of the 12th century and the earlier portion of the 13th century promised well for the establishment in Ulster of an Anglo-Irish province, or miniature kingship, vieing in the arts of civilisation and rational procedure and government on feudal lines with that of the Anglo-Normans in England or France. During the brief period when the princely De Courci was at the zenith of power, we get one glimpse of such a state of things and a reflection or echo of it under De Lascei; but causes were at work to frustrate the consistent development of the province and its permanent conquest,

and also to shatter all attempts at an independent kingship, and to produce the social and political confusion during the centuries which succeeded this brief period.

The salient figures in Ulidia during this brief epoch were earl and bishop, baron and monk, knight and priest, with the occasional glimpse of an Anglo-Norman king or prince thrown in to lend interest to the annals; while for architectural accessories (then entirely new to the province) we have donjon and monastery, castle and cathedral, fortalice and church, barbeican and vicarage. The ancient Celtic peculiarities disappear for the time being; colonies of English monks oust the native culdee; the Irish kernes, with their saffron-coloured linen shirts, disappear before the mail-clad Normans. The transformation scene affects every department of life—social, political, ecclesiastical, civil, and military. The archaeologist in quest of the most interesting vestiges in Ulster of ecclesiastical and military architecture of the Mediæval times should open the very first page in the annals of that epoch, at that red-letter day in February, A.D. 1177, when John de Courci and his handful of Anglo-Norman knights and foot soldiers appeared before Down (Dun De leith glas), and, by a *coup de main*, surprised and ousted its chieftain, MacDunlevy, defeated his “red branch knights,” captured the town, looted the “clothing, gold, silver-plate, and rich booties,” and proceeded to entrench himself and to build a castle. The stirring chapter of events during the century which succeeded this irruption of the Anglo-Normans into the eastern counties of Ulster reads like a romance, as it has been graphically described for us in the Carew MSS., in the Book of Howth, and by Giraldus Cambrensis, and as set forth in Hammer's Chronicle and other records well known to antiquaries.

Over seven hundred years have elapsed since then; “the knights are dust and their good swords rust,” but the ruins of the architectural accessories are still with us. We seek for the art works which enriched these structures; but, alas! too often the art works are gone. It is our business on this occasion to survey the vestiges of this brief brilliant epoch, to catalogue the archaeological flossam and jetsam which are left to us of that most marvellous period of activity in ecclesiastical and military architecture of such relics as have survived through the ebb and flow of invasions, through seven centuries of disaster and spoliation, and subsequent neglect and ruination at the hand alike of friend and foe. There is no document which gives us such an insight into the extraordinary architectural results which followed upon this irruption of the Anglo-Normans into the eastern counties of Ulster as the list or record of the taxation imposed upon the clergy in Ireland, ordered by Pope Nicholas IV., with the consent of the King of England. It was compiled late in the 13th century, about one hundred years subsequent to the time in which De Courci flourished, and shows what was accomplished in the department of ecclesiastical architecture alone, to which, when we have added the immense number of military erections all over the counties Down and Antrim, to secure the conquest of the province to the Anglo-Normans, we recognise that it really was a marvellous period of architectural activity.

In the *magnum opus* of Bishop Reeves (“Ecclesiastical Antiquities of the United Diocese”) we are told that in the year 1323 there was deposited in the English State Record Office in Westminster a leather pouch which was labelled “Hibernia,” and which contained fourteen long rolls of parchment. This is the most ancient collection of ecclesiastical statistics connected with Ireland which we have, and is one of the most interesting to the archaeologist. Now, the rotulets in this leathern pouch, which relate to the diocese of Down and Connor and Dromore, give evidence of the extraordinary number and extent of the works of ecclesiastical architecture erected here in the brief period embraced in the last quarter of the 12th century and the early portion of the century succeeding it, and which distinguished it in Ulster as a distinct and unique epoch of art, fruitful of good works. If we analyse this list we find it refers to five monasteries or abbeys (two of which we know to have been very extensive), two cathedral churches, one priory, 191 churches and chapels, and 43 rectories or vicarages—in all, 234 ecclesiastical buildings—a moderate valuation of which in modern currency would represent nearly one million pounds sterling. When we come to tabulate and estimate the castles, fortalices, and the erections



for military purposes and works in connection with the conquest and retention and government of the province, we are not so certain, as we have no taxation on record of castles, so that an approximation would be hazardous.

In the progress of the lecture, and at this stage in particular, Mr. Phillips exhibited on the screen a number of views of the abbeys and churches of 13th-century construction, and explained, by the plans of the Benedictine and Cistercian monks, the difference in the aims and objects of these two orders, as well as of the Franciscans and other preaching friars. A large number of illustrations of Anglo-Norman castles in Ulster were exhibited, and peculiarities in their modes of construction for defence were explained and illustrated, in particular the following:—The donjon at Dundrum, Green Castle, County Down; Carlingford Castle, King John's Narrow Water Castle, the castles of Ardglass (it was a town of castles, of which a few have survived), Jordan's Castle, Margaret's, Cowd, Audley Castle, Strangford; Kilclief Castle, Portaferry Castle, Castle Ward, Castle Screen, Bright and Clough Castles, both built on duns, or rather, of the Celts; Quoile Castle, Kirkistown; Skiterick Castle (one of the largest of the Anglo-Norman castles now left to us out of the thirty fortresses and pele towers which served to sentinel Strangford Lough), Land Mahoe, Quoile Castle; also Carrickfergus Castle, ancient views of Belfast Castle, Kilsandal Castle, near Coleraine; Olderfleet and O'Halleren's Castles, near Larne; Dunseverick and Dunluce Castle.

#### ART WORKS.

It might be expected that out of these long lists of ecclesiastical institutions which flourished here in the 13th century, and of those military erections which served to sentinel the province of Ulidia, that we should find many examples of Early English foliage and sculpturings by the Norman artists. But we are astonished and grieved to find, on investigating the ruins, how scandalously they have been shorn of such accessories. An individual search through the ecclesiastical remains, with the long list of the original 230 buildings given in Reeves's book in our hands, "lest peradventure even ten may be found therein" which would retain vestiges of Mediæval art works—but, alas! the ruins are there, but the art works are gone, and when we have named Down Abbey, Grey Abbey, Inch Abbey, Movilla, Newtownards Priory, Holywood Church, Carrickfergus, Bona Margy, Churchill, Culfeightrim, and a very few others we have exhausted the list of ruins in which vestiges of sculptured work, or even stone moulded or chamfered work, may be found. Furthermore, in the search for Mediæval sculpturings, if we seek among the scattered remains of the old pele towers, fortalices, and castles, built so numerous by De Courci and his retainers in Down and Antrim, we are forced to believe by the paucity of such work in the castles that the application of art foliage to architecture was in the hands of the church and abbey builders in the Early Gothic days;—even the oratories or chapels sometimes attached to their fortresses are almost devoid of such refinements. The military masons were in such haste to construct them that they could scarcely find time even to chisel a stopped chamfer on the jambs of the doors, and accordingly left to the church builders who followed so closely on their iron heels those loving characteristic touches of art which we find more or less in all ecclesiastical buildings of that and succeeding Gothic epochs. For instance, the immense pile of solid masonry of the old Castle of Fergus (Carrickfergus), is unrelieved by a touch of the sculptor's art, save in the foliage of the capital of the column in the ancient oratory, now used as a soldiers' bedroom; elsewhere through the fortress we seek in vain for any "waymarks of art" usual in a Gothic building, which would serve to identify its age, or corroborate the suggestions and guesses as to its origin, or fill the hiatus in its early history.

#### MONUMENTAL SCULPTURE OF THE MEDIÆVAL EPOCH.

It is not till we come to the grave of the warrior in the abbey yard, and look upon the sculptured cuneiform slab which marks his last resting-place, that we find any association of art with the members of his turbulent profession; and in the cuneiform gravestones, military and ecclesiastical, scattered in the precincts of various ancient monastic institutions in the Ards of Down, there is an interesting field for study and tabulation and illustration. These slabs, in spite

of the despoiler, still display their foliated crosses and other symbolical ornament sculptured or incised thereon; the edges of the slabs are sometimes simply chamfered, often moulded, and occasionally decorated, as the one at Inishargy; then at the base of the cross in nearly all cases are the well recognised steps of the Calvary out of which the stem of the cross emanates; and very frequently there are to be found carved on the tombstone other symbolical ornaments, such as the sword and shield on a Grey Abbey tombstone, or the foliated crosses with shears, as at Movilla, or fragments of cuneiform slab with incised cross and chalice, as an Inch Abbey. There are at present to be found at Movilla Abbey a very fine series of about twelve cuneiform tombstones. In order to preserve them from further injury, and from being appropriated by Goths in search of a gravestone, they have been carefully attached to the north wall of the old church, under the paternal care of the Board of Works. These slabs are all Early English in character and decoration except one, which is Celtic in type, having on it the inscription "Or do Deritend" ("Pray for Deritend"). This slab was found near to Movilla Church, in Mr. Jamison's garden, under the shade of an old yew-tree, in the year 1840; but who the Deritend was no one can say. Our notice of Gothic monumental art would be incomplete if we omitted to notice the torso of a cross-legged effigy at Grey Abbey, which is propped against the wall in the side chapel, in fitting companionship with that of the devout Affrica, wife of De Courci. This weather-worn, mutilated, headless trunk of a crusader's effigy is stated to be that of De Courci, and it is not improbable that it was so. We know for a fact that he was "crossed to go as a crusader." History and tradition unite in showing him to be an extraordinary character, and if in kingcraft he sought to emulate in Ireland the successes of William the Conqueror, so he also emulated the castle-building skill of Richard Cœur de Lion, whose donjon and fortress in the Ardeys, near Rouen, De Courci sought to reproduce at Dundrum, near to Down—of course, in an Irish way, and to an Irish scale.

It is not improbable that, when De Lacy ousted De Courci out of Down, the affectionate wife, Affrica, caused the effigy of De Courci (which, in accordance with the custom of the period, occupied its position in the founders' wall tomb in Down Abbey) to be removed to this secluded out-of-the-way abbey in the Ards, in order to save it from De Lacy's spiteful mutilation. On the death of her husband, about 1219, she retired to Grey Abbey to spend the remainder of her days in works of piety. In this effigy the features which most interest us are the remains of Mediæval sculptured foliage, which we find carved so cleverly at the edge of the slab on which this cross-legged effigy reclines, and which must originally have been very beautiful. We have yet on it portion of the sculptured Chantry priest, kneeling at his office at the head of the slab; at his feet crouched the carved lion, boldly chiselled, forming a usual accessory to the monument of a Mediæval knight. The remains of this heraldic lion is one of the many unattached scraps of Gothic sculpture found now in the abbey.

Henry II. made various pretexts for undertaking the conquest of Ireland, to aid which he seems to have adopted in Ireland the same device which his fathers had adopted to facilitate their aggrandisement of Wales—i.e., he partitioned the country among his enterprising warriors, and "accepted their homage in advance of possession," authorising them to maintain troops at their own charges so as to make good his grant of what never belonged to him. No portion of Ireland, except Wexford, was so thoroughly castled as the shores of Lecale and the Strangford Lough. We have remains to this day of Anglo-Norman castles and keeps, each within a few miles or signalling distance of each other. Avoiding the treacherous glens, they selected often the ancient Celtic duns for the sites of their castles, as the donjon of Dundrum; more frequently we find the remains of their fortalices on the rocky peninsulas or islands in the fiords as on Strangford, or serving to sentinel the heads of the numerous inlets or lagoons. In County Antrim they perched them on the basal crags which fringe the coast from Carrickfergus to Dunluce and Dunseverick; till they belted the coast of Ulidia and the shores of its fiords with fortresses and pele towers, castles and keeps. For strategical and personal reasons, De Courci and his Anglo-Norman barons in Ulster relied for their base of supplies upon their

maritime connections with the Isle of Man and Wales, and even with Lancashire and Cumberland, rather than with their Anglo-Norman compatriots of the English Pale in Ireland, or with the king's viceroy in Dublin, who was jealous of De Courci. Such physical difficulties as the Mourne Mountains and the mountainous district round Carlingford, as well as the bogs, morasses, and forests of Meath, interposed between Dublin and Ulidia, and served the purposes of De Courci's policy, isolating him by land, and favouring his ambitious projects and assumption of semi-royalty and independent state. The Angevin King Henry II. had so many irons in the fire in the various pressing circumstances in his dominions in France and in England that for the time being the rapid march of events in the north-east corner of Hibernia passed unnoticed except by the Viceroy de Lasci in Dublin, who was biding his time in order to humiliate the Earl of Ulster.

De Courci's connection with the Scandinavian King of Man, and his occasional military and political alliances with the Norsemen of that kingdom, made it comparatively easy for him to absorb and draw to his forces the Ostmen from their maritime settlements on the fiords of Ulster—such as Carlingford and Strangford. During the term of De Courci's rule here, Ulidia became colonised by a large number of English adventurers, whose names and descendants are still well represented here in Ulster. As was natural, he was followed by hosts of friends from Wales and Cumberland—traders as well as military. It was a stirring time here in the counties of Down and Antrim in the closing years of the 12th century. He brought over colonies of monks, he fostered and encouraged the architectural profession, both for abbey and church architecture, as well as for his castles, and he patronised the constructive arts. Under the vigorous rule of this militant churchman all the ancient ecclesiastical arrangements of the diocese were completely transformed, and the country was studded with churches, chapels, abbeys, and vicarages, built in stone and mortar (a new revelation to the wattle-working Celts). The annals of the succeeding centuries show that there has been nothing like it in Ulster for over 600 years, after De Courci's time, until in this 19th century the Ecclesiastical Commissioners of Ireland bestirred themselves to build parish churches, and the various religious denominations organised their church extension schemes. The church and chapel builders and ecclesiastical art workers had a good time of it here in the closing years of the 12th century and early in the 13th century, as such armies of masons, and carpenters, and builders, and artificers would be necessary in the erection of the numerous castles which De Courci's followers built in County Down, in Ardglass, and around Strangford Lough, and in County Antrim, from Carrickfergus to the eyries on the rock-bound coasts of the Giant's Causeway. This went on coincident with the imperious demands of De Courci for abbeys for his colonies of Benedictine and Cistercian monks, as well as for the numerous secular chapels, oratories, altars, rectories, and vicarages, of which we have such a long list in the taxation made in the 13th century, given in Bishop Reeves' book! It was not till 1232 and 1240 that the Franciscans and Dominicans appeared in Ulster.

De Courci was as distinguished in acts which combined craftiness and devotion as he was in military prowess. In his wily policy with his Irish subjects he became a fervent votary and benefactor at the shrine which he constructed for the bones of St. Patrick, the apostle of Ireland, with which he also caused to be enshrined the relics of St. Brigid and St. Columba. Donard, an Irish art workman, ornamented the shrine erected within the sanctuary of his cathedral. This cathedral was the minster of the magnificent Benedictine Abbey at Downpatrick, the chancel or choir of which alone was as large as the entire modern cathedral of Down; which, in fact, was built on the ruined arcades of De Courci's choir. Here we have presented to us some very curious carvings and scraps of art works. Dr. Lanigan tells us that, "in the peculiar manner then in vogue of founding monasteries, and in the fashionable mode of purchasing off sins and obtaining forgiveness from Heaven, De Courci distinguished himself beyond many others." This was simply robbing St. Patrick to pay St. Peter, for he turned adrift the native Irish clergy without compensation, and in their places established colonies of monks from various parts of England, as a perusal of the long list of abbeys,



founded and refounded by him, would prove. The pulses of ecclesiastical and architectural life beat slower and slower in Ulidia when the great Earl de Courci lay powerless in the grave, and beat still slower and slower when the earls who, having deposed and ousted the valiant de Courci, are themselves pitted by the King against each other, and successively deposed and ousted. Then the long billows of adversity rolled over the churches and abbeys, but chiefly over the noble Abbey Minster at Down. The churches and abbeys, with their battlemented and crenellated towers, and their pure Early English details in arcade and column, became dilapidated, and come in for some of the hard knocks which were going all round late in the 13th century, during which the English earls and barons and the Celtic petty kings and chieftains so often change sides. The records tell us of the frequent desecration and burning of the Abbey Minster at Down, and of the efforts to collect money to repair and rebuild it. Mr. Phillips here exhibited illustrations of the unique series of sculpturings in Downpatrick Abbey. The art student desirous of seeing in this united diocese the best and most extensive remains of that Gothic epoch of Mediæval architecture known as the Early English style, must travel all the way to Grey Abbey, in the Ards of Down, about six miles south of Newtownards, and there, in a secluded spot, sheltered behind a wooded hill, close to a never-failing spring of pure water, in "a populous solitude of trees and birds," he will see laid out on the greensward the perfect ground plan in cut stone of a complete Anglo-Irish abbey of the Cistercian reformation. When we explain that it was founded in the year A.D. 1193, that it was built for Barnardine monks, and that most probably the greater portion of it was wrought by the hands of the monks themselves, you may expect something characteristic, when you are informed that it was the spontaneous, generous free-will offering, after the glorious fashion of the times, of pious Africa, the devout wife of John de Courci, first Earl of Ulster; when all this has been stated about the abbey ruins, you may expect architectural details of chaste simplicity, that the sculpture, or traces of it, will be severe, and that the mouldings will be the purest of their type, that the plan will be common sense, and the arrangements sanitary. We find our interest focussed here at Grey Abbey, because it is a souvenir in Ulster of an epoch of spiritual awakening in Europe; just when Europe was emerging from the dark ages, an awakening as remarkable as that of Apostolic times, or of Wycliffe and his followers in the 14th century, or of Luther's Reformation in the 15th century, or of the revival times of more recent years. This ruin at Grey Abbey also evokes our interest as being the best and most typical relic in this province of that new departure in Mediæval times of ecclesiastical art—that great reformation of architecture in the 12th century which so rapidly within a century studded Europe with some of the noblest structural creations which the world has ever seen. There is proof in the progressive or transition character of the architectural work at Grey Abbey that it took several years to build. You will notice the round arch, Romanesque or Norman work, the earliest work in the stone-cutters' details; then you will notice the beautiful arcade of windows in the gable, which are lancet shape, and are the Early English work. Look, then, at the richly-moulded deeply-recessed doorway of 13th-century work: you observe the deeply-cut dog-tooth ornaments, and the traces of carved foliage on the capitals. This shows still further progression in architectural work. True, this abbey does not compare in overwhelming massiveness and magnitude with Tintern, or Fountains or other Yorkshire and Lancashire Cistercian abbeys, nor does it possess such a vast field of sculpturing or architectural detail; but in its ground plan, which is still unaltered, there is evidence to show that Lady de Courci's monk builders in her own lifetime completed the abbey all in accordance with that particular arrangement which the Cistercians made their beau ideal.

At the conclusion of the lecture a number of lantern slides of antiquities of the North of Ireland were shown by Mr. Milligan.

#### STEEL BRIDGE PINS.

MR. A. C. CUNNINGHAM, M.Am.Soc.C.E., in a paper on "Steel Bridge Pins," published in the *Transactions* of the Society, submits a specification for improved bridge pins. It is

proposed that they should be made of open-hearth steel. The pins used generally are of two kinds, "rolled" and "forged." The author says, "In the case of rolled pins the main consideration of the roller is to finish the pins truly round, and of the required diameter, and not break his rolls. This last consideration leads him to have the bloom heated as hot as may be without burning, and in consequence it happens that some blooms are too hot and are burnt and overheated. Six-inch pins are often finished so hot that a bar 25ft. long can be cut into 18in. lengths on the hot saw." These pins, he says, "in consequence, lack work, both in reduction of section and finishing temperature, and are likely to be coarsely crystalline and deficient in toughness and ductility, if not absolutely brittle." It is found that forged pins are better than rolled pins, and that the better the steel the better the pin. It is also found that a medium hard steel of about 70,000lb. ultimate strength will give better results than a soft steel. All pins are improved by annealing. Mr. Cunningham gives a series of tables which show interesting results. These prove that the rolled pins made from common steel are not so good as those annealed, which show greater ultimate strength.

#### CARPENTERS' COMPANY'S EXAMINATIONS.

THE annual examination for shop and outdoor foremen, &c., held by the Carpenters' Company took place at their Hall, and at the Company's Trades Training Schools, Great Titchfield-street (for the practical work) on June 10-13. Among the examiners present were Messrs. J. Wolfe Barry, C.B. (President of the Institute of Civil Engineers), F. C. Penrose, F.R.S. (ex-President R.I.B.A.), Professor Banister Fletcher, F.R.I.B.A., Prof. T. Roger Smith, F.R.I.B.A., and Mr. Beresford Pite (President of the Architectural Association). Of the candidates who presented themselves, the following passed. The number is larger than in any previous year. We have arranged the names in order of merit:—

Jas. Williamson, extra silver medal.  
 FIRST CLASS CERTIFICATES.—(1) Jas. Clark, silver medal, (2) J. L. Oakey, bronze medal, (3) J. T. Hall, (4) I. G. Clarke, (5) R. C. Freeman, (6) H. Harrington, (7) G. T. Claydon, (8) T. B. Kidner and F. Hibberd (seq.).  
 SECOND CLASS CERTIFICATES.—(9) Geo. Ayres, (10) H. G. Owen, (11) L. H. Bennett, (12) W. O. Jordan, (13) A. T. Dermott, (14) Jas. Nowell, (15) A. E. Atkins, (16) F. Bull, (17) W. Middleton, (18) Jas. Cluff, (19) W. E. Lewis, (20) H. Eustice, (21) G. F. Hicks, (22) Chas. Phillips, (23) W. A. Cross, (24) A. A. Reed, (25) J. E. Pearce and T. Pilgrim (seq.), (26) W. A. Hill, (27) I. G. Andersen, (28) H. Haynes, (29) F. S. Judd (30) H. C. Williams.

#### CONSTRUCTION OF STEEL PIPES.

IN a paper on the "Flow of Water in Wrought and Cast Iron Pipes from 28in. to 42in. Diameter," by Mr. I. W. Smith, M.Am.Soc.C.E., a description is given of the steel pipes used in the water supply of the City of Portland, Or., from the Bull Run River. These pipes are "composed of 60in. plates, made in alternate large and small sections, the small fitting at each end into the larger. The plates are double riveted on the straight seams, single riveted on the round, and coated with a preparation of asphalt, which round off the projecting edges of the joints and tend to lessen the frictional resistance on the pipes. The rivets were not countersunk. On the 42in. pipe the thickness of the plates corresponds to Nos. 6 and 4 B.W.G. except for about half a mile, on which it is 3in. On the other pipes, 35in. and 33in., the thickness is 0.203in., or No. 6 B.W.G." The author refers to the distortion caused by the pressure of the earth filling, which reduced the vertical and increased the horizontal diameters 1in. to 4in., according to the depth of the fill and the care in tamping under and round the pipes. By experiments made by jack screws and loads of earth, it was found that under any load the mean of the diameters was equal to the diameter of the circular pipe. When relieved from pressure the pipe resumed its original form, and remained tight when subjected to a hydraulic pressure of 150lb. to the square inch. All riveted and wrought pipes are subject to this change of action more or less according to the thickness of plates, the diameters, and the filling. The steel pipes were made of different diameters to suit the grades. There were 42in., 35in., and 33in., the greater diameter extending from the head works down Bull Run and across the Sandy River. The

42in. pipes were over very rough ground with many bends and summits. It is stated that the water is conducted to the city through these riveted steel and cast-iron pipes, the first 24 miles and the other six miles in length. The former extend from the source to the reservoir on the east of the Williamette River; thence the cast-iron pipe to a reservoir on the west side, passing under the river by means of a submerged pipe 2,000ft. in length. The author's paper gives the equations deduced from the hydraulic formula of discharge, and tables of diameters, height, and hydraulic grades of the pipes, and he shows the differences of flow and discharge caused by the bends and grades.

#### THE LANCASHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.

THE second annual general meeting of this Federation was held at the Palatine Hotel, Blackpool, on Saturday last (June 13). The president, Mr. John Fecitt, Blackburn, was in the chair, and there was a large attendance of representatives from Accrington, Ashton-under-Lyne, Blackburn, Blackpool, Burnley, Chorley, Colne, Darwen, Nelson, Oldham, Preston, Rochdale, Stalybridge, &c. The minutes of the half-yearly general meeting, held at Blackburn in December last, were read and confirmed, and the report was unanimously adopted. In the report the committee referred to the progress made in strengthening the Federation during the half-year. The two local associations, Ashton-under-Lyne, Stalybridge and district, and Blackpool, had joined during the past six months, and others were expected to do so shortly. The relations between employers and operatives were reviewed at some length, and details given of the changes in rates of wages, hours of labour, and working rules. The treasurer presented his accounts, which were considered very satisfactory, and the balance-sheet was adopted and ordered to be printed. Mr. W. Cunliffe was unanimously elected president of the association for the ensuing year, receiving the nomination of the majority of the branches. Mr. James Storrs, Stalybridge, was elected vice-president, Mr. F. W. Briscoe, Bolton, hon. treasurer, and Messrs. W. Shepherd, Rochdale, and J. Hawley, Colne, hon. auditors. The representatives elected by the branches on the executive committee were approved. The secretary (Mr. J. Tomlinson, Preston) reported that counsel's opinion on the form of indenture of apprenticeship selected for adoption by the executive committee had been received, and in consequence of that opinion an amended form had been drafted by the solicitors. The form was duly considered and adopted for use in the federated towns. It was decided to amend the rules to give the executive more control over the affiliated associations, and to elect an emergency committee to deal with disputes and matters of urgency. Other business of great interest to the trade was considered, and suggestions dealt with as to the best method of strengthening the Federation and extending its influence, while reports of dispute were received from the various branches. A hearty vote was passed thanking the retiring president for his services during the year, and for his exertions in forming the Federation, and Mr. Fecitt having suitably responded, the meeting terminated. The next quarterly meeting will be held at Darwen in September.

#### CHIPS.

Last week a special meeting of the Blackburn Town Council was held to make the appointment of a borough and water engineer for the borough, the post being worth £700 per year. Mr. Stubbs, the borough engineer of Darwen, was appointed.

The Stirling Town Council had a long discussion on Monday night on the subject of the new municipal buildings for the burgh, the discussion following upon a motion to come to a decision as to a site. The Provost expressed his preference for the Corn Exchange site, several members favoured the site of the present Council Chambers, and others were for delay. Ultimately the matter was delayed for two months, in order that additional information might be put before the members.

With regret we announce the death of Mr. Martin Kelly, builder and contractor, Dominick-street, Galway, on Wednesday week. He had contracted for and executed many important building works in and about Galway, and always gave the greatest satisfaction.







# THE BUILDING DEWS, JUNE, 191396.

ECCLESTON RECTORY CHESTER T.M LOCKWOOD & SONS ARCHTS



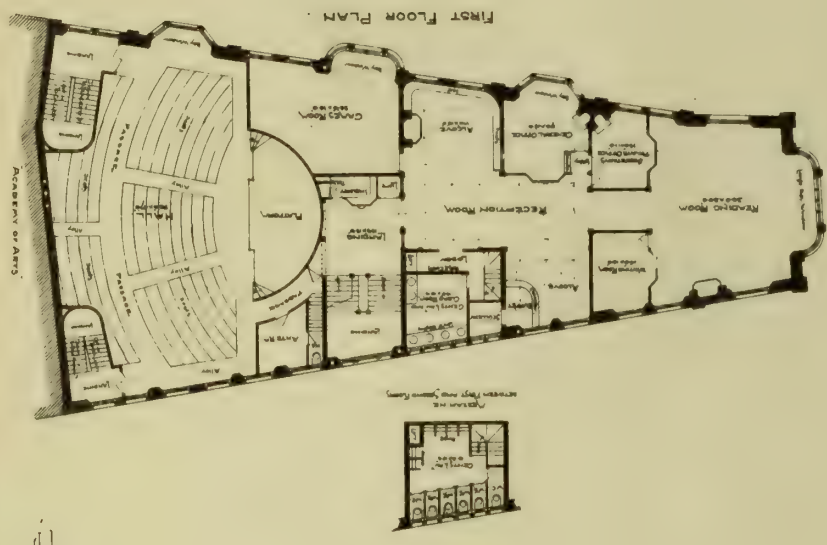
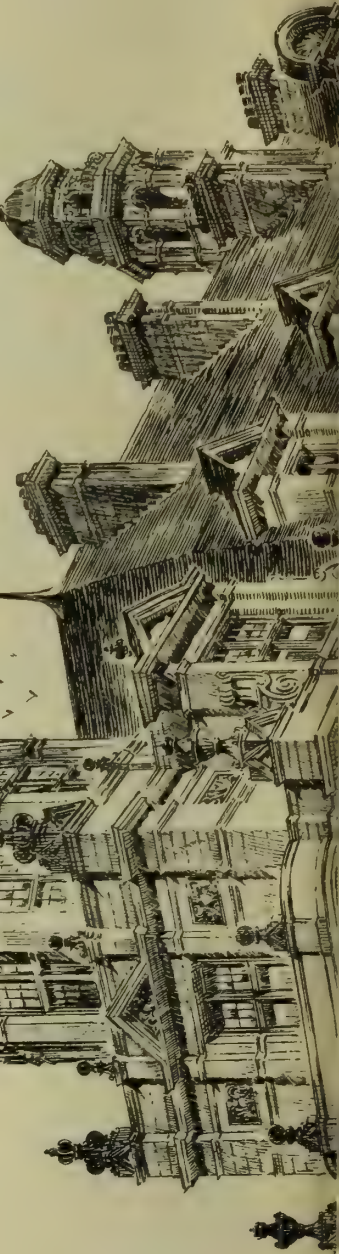
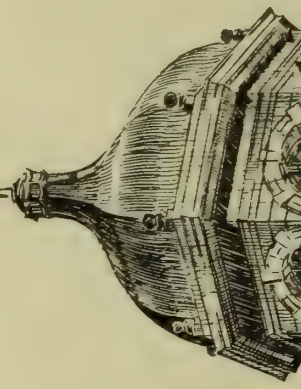
St. Hill, 1896.







YOUNG MEN'S CHRISTIAN ASSOCIATION · NEW PREMISES · NEWCASTLE-ON-TYNE ·  
J.W. TAYLOR FRIDA ARCHT





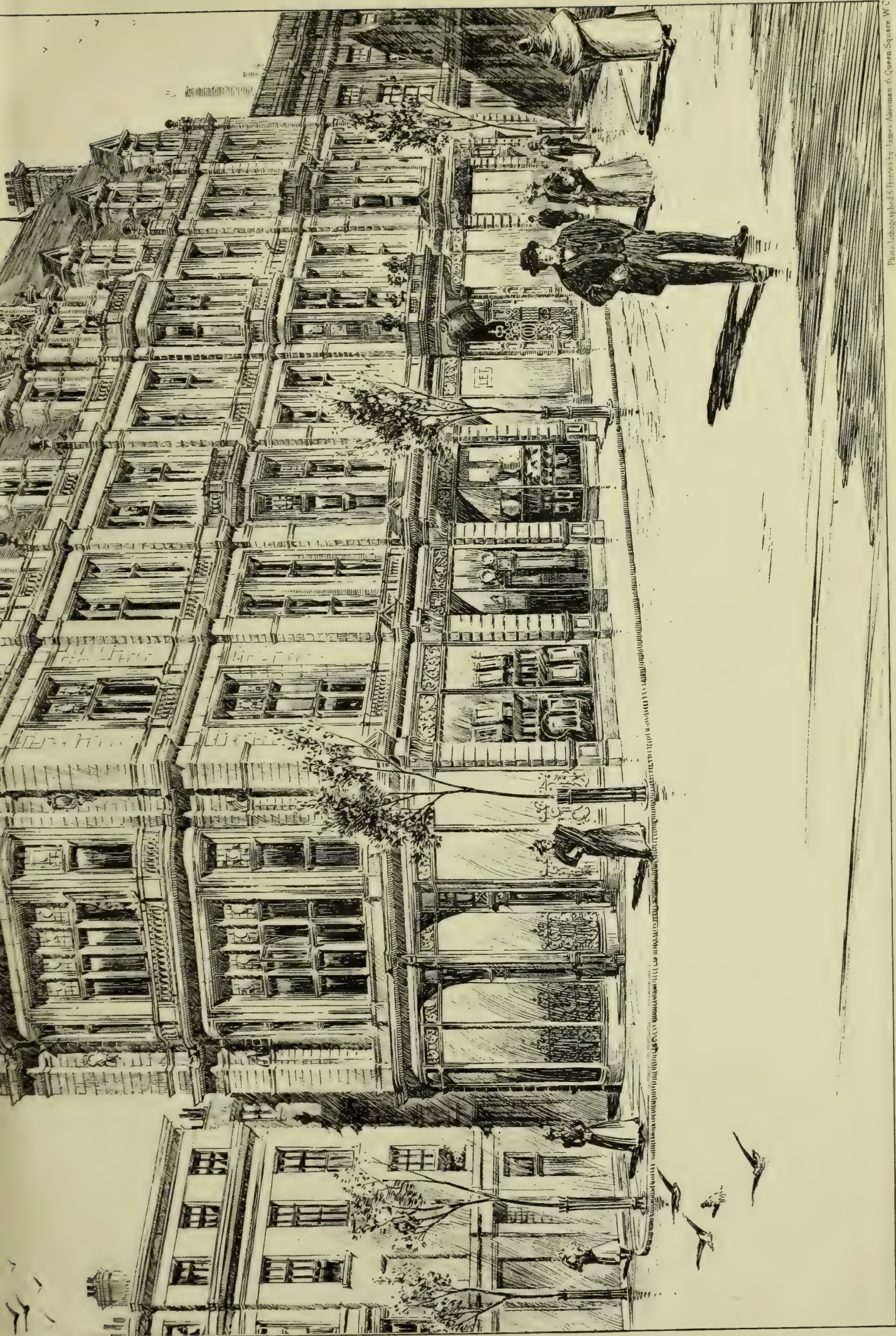


Photo Lithograph & Engraving by James Alderman 6, Queen Square W.C.

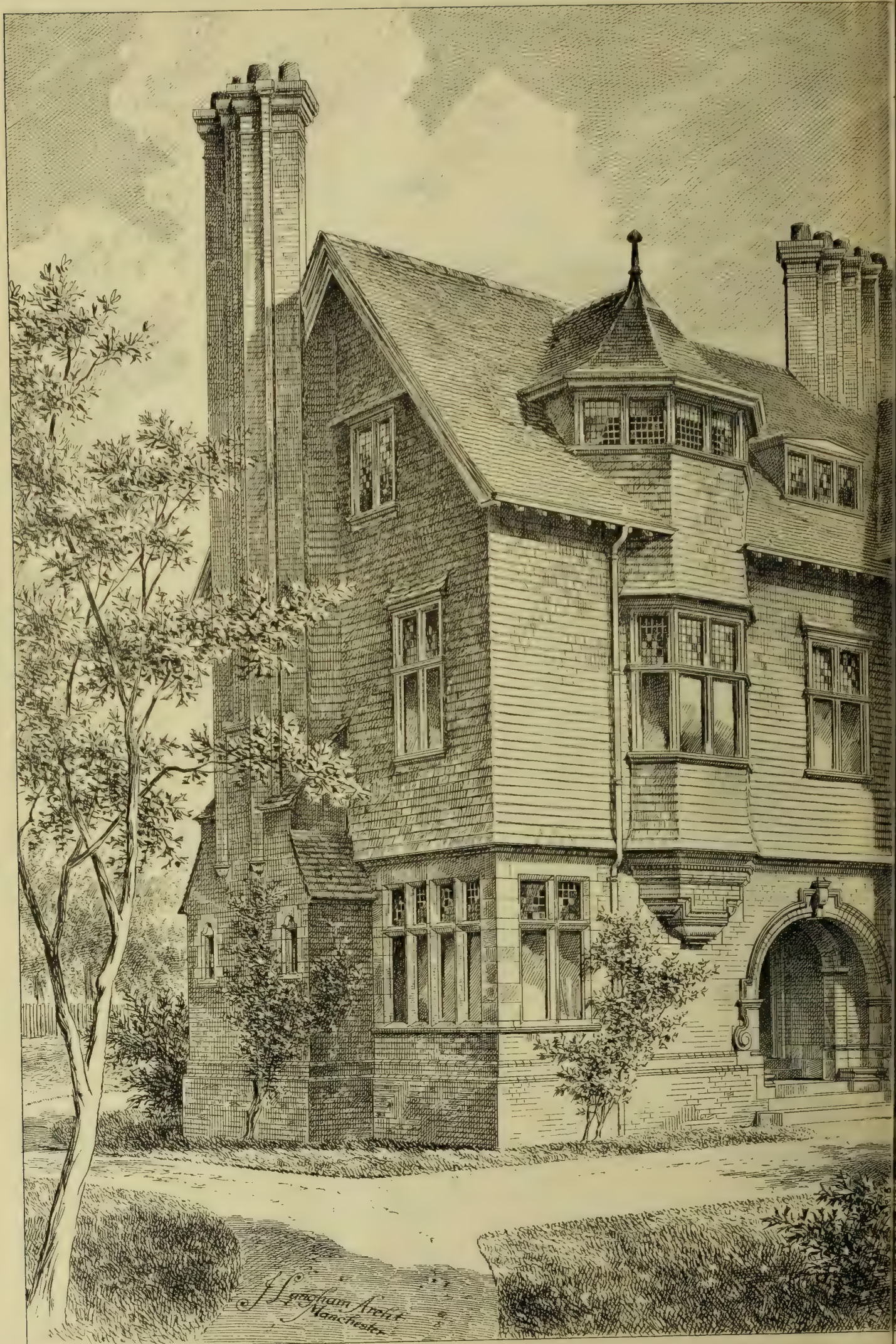






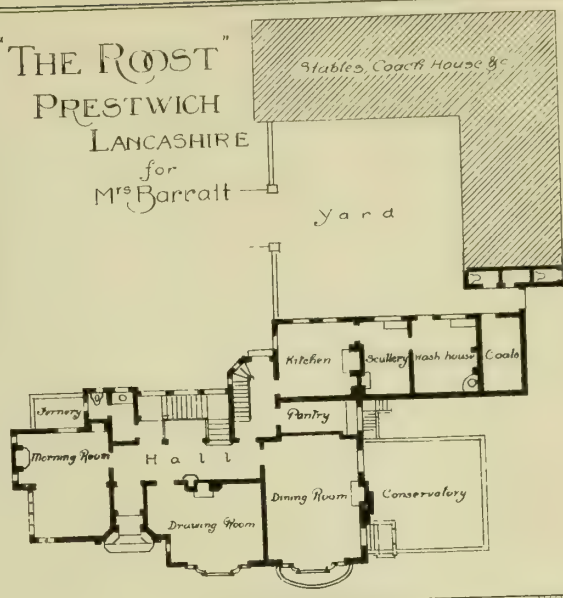








"THE ROOST"  
PRESTWICH  
LANCASHIRE  
for  
Mrs Barratt





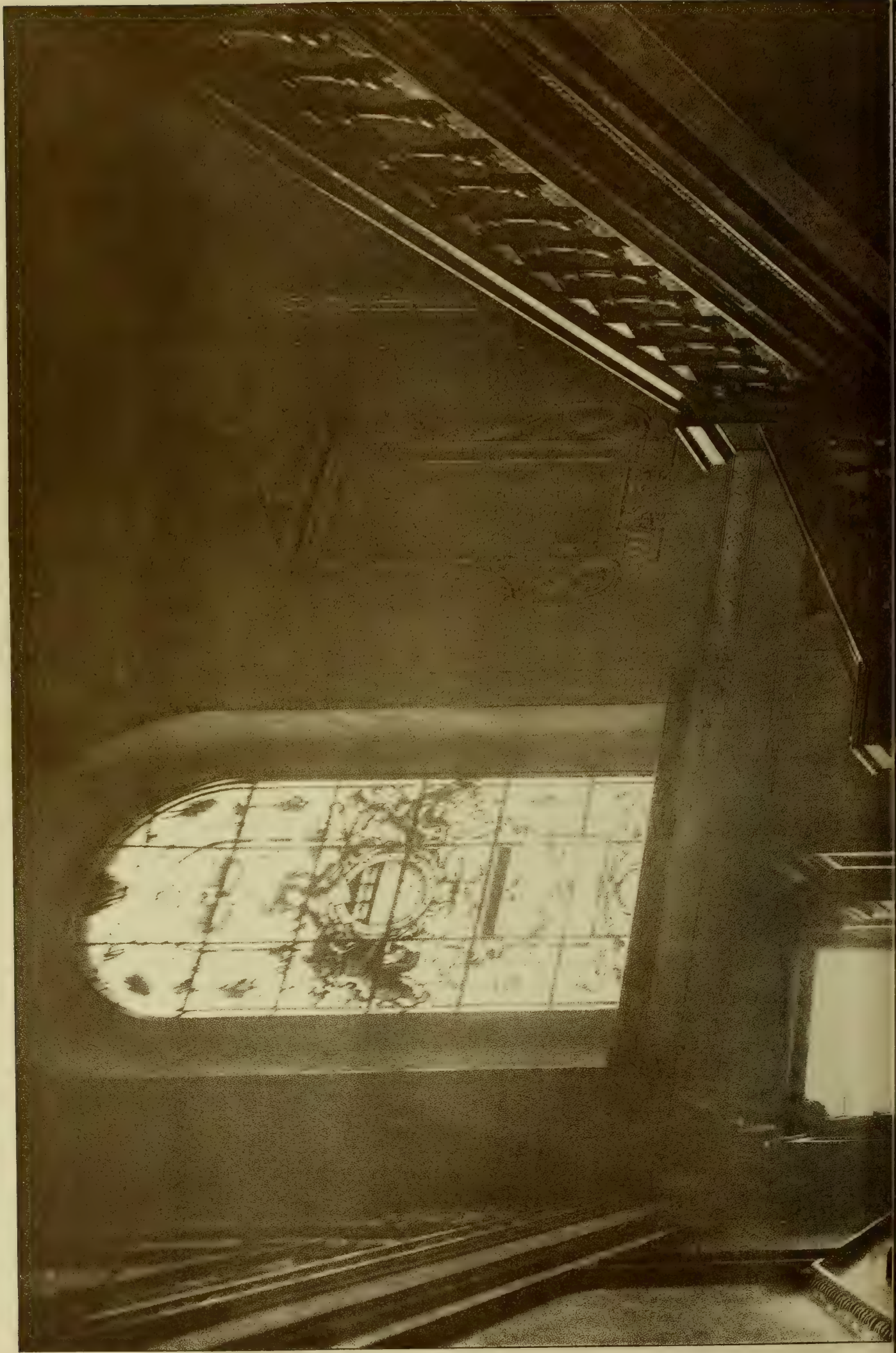








THE BUILDING DEPT., JUNE 30, 1896.





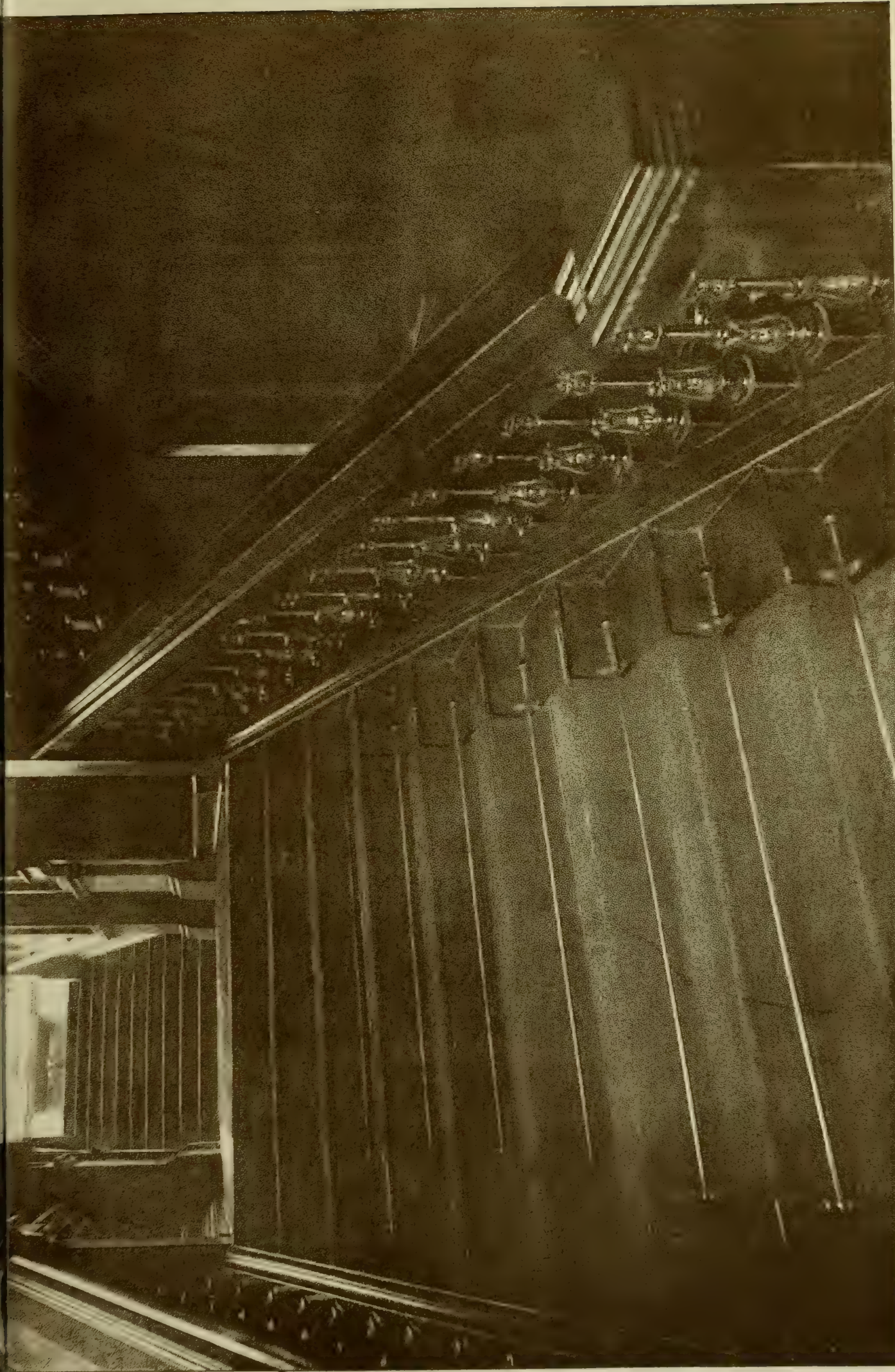


PHOTO TAKEN BY JAMES H. HARRIS, NEW YORK, N.Y.

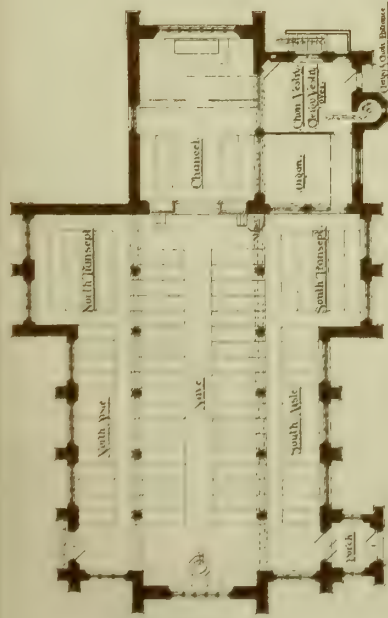
THE CITY GUILDS No 20.  
THE HALL OF THE SKINNERS' COMPANY THE STAIRCASE.

PHOTOGRAPHED WITH A SANDERL PLATE.

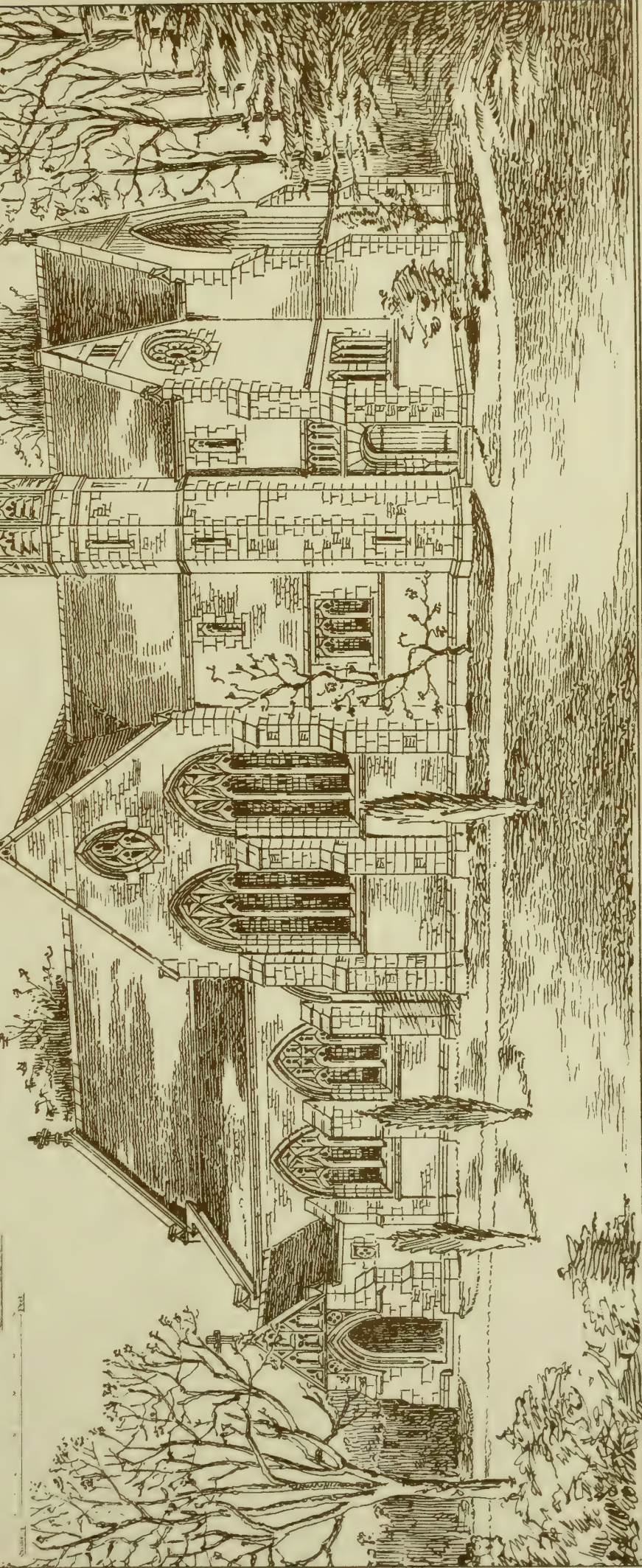








Ground Plan.



: Christ Church : Meaton nr Bolton : — R. Knill-Freeman, Trib. o. Architects.







## CONTENTS.

Some Burning Questions .....	883
Initial Supervision .....	884
Royal Institute of Painters in Water-Colours .....	885
Sewage Purification .....	885
Building Societies .....	886
Concert-Halls and Assembly-Rooms.—XX.....	886
Warming Buildings by Hot Water.—I.....	888
The Timbers of Australasia.—IX.....	888
The Anglo-Normans in Ulster .....	890
Steel Bridge Pins .....	892
Carpenters' Company's Examinations .....	892
Construction of Steel Pipes.....	892
The Lancashire Federation of Building Trade Em- ployers .....	892
The Building News Directory .....	XL
Our Illustrations .....	893
Building Intelligence .....	912
Parliamentary Notes .....	912
Water Supply and Sanitary Matters .....	912
Cast-Iron in Builder's and Contractor's Work.— XXVII.....	913
Public Works in Hanley during the Past Ten Years.....	914
Hot Water .....	914
Architectural and Archaeological Societies .....	916
Correspondence .....	916
Intercommunication .....	917
Legal .....	917
Legal Intelligence .....	917
Our Office Table .....	918
Meetings for the Ensuing Week .....	919
Trade News .....	919
Tenders .....	919

## ILLUSTRATIONS.

THE HALL OF THE SKINNERS' COMPANY.—"THE ROOST,"  
PRESTWICH.—YOUNG MEN'S CHRISTIAN ASSOCIATION,  
NEWCASTLE-ON-TYNE.—CHRIST CHURCH, HEATON, NEAR  
BOLTON.—ECCLESTON RECTORY, CHESTER.—DORMITORY  
AND APARTMENT BUILDINGS, BOSTON, MASS., U.S.A.

## Our Illustrations.

CITY GUILDS, NO. XX.—THE HALL OF THE  
SKINNERS' COMPANY: THE STAIRCASE.

THE famous "Cedar Room" of this City Guild was illustrated in the *Building News* for May 24, 1895, when we published a sheet of drawings of the Company's historic plate. To-day we give a photograph of the staircase, erected in the early days of the Georges, when the wainscoted oak parlour was carried out. The hall was refronted by an architect named Jupp in 1790. A brief account of the history and foundation of the Skinners' Company appeared in our pages when the above-named illustrations were given.

"THE ROOST," PRESTWICH, NEAR MANCHESTER.

THIS house takes the place and name of an old one on the site, now demolished. It has been built in a substantial manner with solid external walls 14in. in thickness, and faced with small Accrington bricks of a fine red colour. The upper portion of gables and the spaces dividing the bay windows are in cement, with modelled ornament in relief. The roofs are covered with Broseley tiles of a purple brown colour, and the vertical tile hanging is of a lighter shade. The ground-plan annexed to the view shows the accommodation of that floor. In the basement there is a well-lighted billiard-room, besides larder and wine cellar. The first and second floors provide eight bedrooms in all, with the usual bath, linen, and box-rooms, lavatory, &c. The entrance hall is panelled to a height of 6ft. in Kauri pine, with leather paper above, and is divided from the main staircase by square fluted columns; these and the balustrade of staircase are also in Kauri pine, and the floor laid with lin. oak and mahogany parquet. The drawing-room is designed in "The Adams" style, the woodwork painted ivory white with salmon-coloured paper for filling. The contract has been carried out in a satisfactory manner by Messrs. S. Megarity, of Strangeways, Manchester, from the designs of Mr. John Langham, architect, Manchester.

NEW PREMISES FOR THE YOUNG MEN'S CHRISTIAN ASSOCIATION, NEWCASTLE-ON-TYNE.

THE Association has acquired the block of property known as the Joiners' Hall, and Blackett-street Post-office, lying between their present premises and the Academy of Arts. It is intended to pull down the whole of these premises and erect a new building (which we illustrate herewith to-day) from designs prepared by Mr. J. W. Taylor, F.R.I.B.A., of Newcastle-on-Tyne, which were selected in competition by the assessor, Mr. G. G. Hoskins, F.R.I.B.A., of Darlington. It will have a frontage of 133ft. in Blackett-street, and the cost, including fittings, is estimated at £19,500. The site is at the

junction of the three main thoroughfares, Grey-street, Grainger-street, and Blackett-street, and is one of the finest in the city. The premises will comprise a well-lighted basement, and four stories above. The café in the basement comprises large public dining-rooms and ladies dining-room (each provided with separate lavatories), kitchen, scullery, larder, coal cellars, &c. The principal entrance is in the centre of the façade in Blackett-street. Ascending the staircase to the first floor, a spacious landing is overlooked by the general office of the Association; on the left is the main floor of the large hall, and on the right the reception room. The reception room is 34ft. by 20ft. Opening out of the reception room is the general and private office, with counter and desk for clerk, and telephone box. The large hall has accommodation for 700 persons, including platform and gallery. On the second floor is the committee room, which is 24ft. by 13ft. 6in., and has a large bay window overlooking Blackett-street. The young men's parlour adjoins this room. A 6ft. corridor runs down the centre of this floor to the small hall situated at the Monument end. This hall will seat 300, including 30 on the platform. An ante-room (with lavatory above) adjoins. A kitchen, with cooking range and usual storage room, is placed next to the ante-room, and is intended to be used in connection with *soirées* or other large social gatherings. A ladies' lavatory and cloak-room is arranged in a mezzanine floor between the second and third floors. The remainder of this floor is occupied by the gallery of the large hall, access to which can also be gained by the main staircase. The gymnasium, 53ft. by 48ft., is placed on the third floor over the large hall, and is provided with a special double floor to prevent any sounds from the exercises there reaching the hall. Provision has been made on this floor for lavatories and baths, dressing-rooms, and lockers for gymnasts, instructor, and leaders. The remainder of this floor, with the exception of one classroom, 18ft. by 16ft., has been arranged as a first-class photographic studio, including reception-room, gentlemen's dressing-room, ladies' dressing-room, and lavatories. The top floor contains a photographic studio, 31ft. 6in. by 22ft., dark room and office in the tower; also a visitors' gallery to the gymnasium, approached by a separate staircase from the corridor on the third floor.

NEW CHURCH AT HEATON, NEAR BOLTON.

THE above new church, which has been carried out from the designs and under the supervision of Mr. R. Knill-Freeman, F.R.I.B.A., of Bolton and Manchester, is rapidly approaching completion, and will shortly be consecrated by the Lord Bishop of Manchester. The style of architecture adopted is the Decorated, the plan embracing nave, north and south transepts, and aisles, chancel, clergy and choir vestries, and organ-chamber on the south side of chancel, space being left on the north side for a chapel or chancel aisle when required. The length of the new edifice internally is 101ft.—69ft. being given to the nave and 32ft. to the chancel. The width across the transepts is 59ft. and across the aisles 44ft., the nave and chancel being 21ft. wide. A porch gives entrance on the south side, and there is also a door on the north side. The vestries are provided with a separate entrance, that reserved for the clergy being approached by a circular staircase, which is finished as a bell-turret, and surmounted by an ornamental weather vane. Accommodation is provided for 450 worshippers. Externally the church has been built of flat-faced Yorkshire parpoints relieved by red Rainhill stone dressings to the windows, doorways, &c., the roofs being covered with strawberry-coloured tiles. Internally, the arcading and other stonework has been executed in Corsham Down, Bath stone, the walls generally being plastered, and the woodwork pitch-pine throughout, unvarnished. A handsome reredos in oak is also to be erected in the church. The amount of the contract is about £4,000, and the work of erection has been carried out by Messrs. Edward Lewis and Sons, contractors, of Blackburn, their sub-contractors for the woodwork having been Messrs. Moore Bros., of Rawtenstall, and Mr. George Speechly acted as clerk of works.

ECCLESTON RECTORY, CHESTER.

THE drawing illustrated is now being exhibited in the Royal Academy, and the building is in course of erection by Messrs. Thos. M. Lockwood and Sons, architects, of Chester, for His Grace the Duke of Westminster, K.G.

The plan shows the general arrangement and accommodation. The elevations are treated in thin Ruabon facing bricks, the angles, quoins, windows, and gables being in red and white stonework, and the roofs are green slated. The works are being carried out by Messrs. Parker Bros., contractors, of Chester.

DORMITORY AND APARTMENT BUILDING AT  
BOSTON, MASS.

THIS building, which we illustrate herewith, is designed to meet the demand for small apartments containing from two to three and four rooms and bath each, in a desirable and central locality, for a reasonable rental, and particularly for the students of the Institute of Technology, and art and medical schools. The plan of the building is a complete quadrangle, with an interior courtyard, having an area of about 7,500sq.ft. All the entrances to the building are from the courtyard. Along the northerly side of the court are three entrances to the stair halls, and on the southerly side four. These stairways continue to the top story, and give access to the apartments at each floor. This plan avoids the necessity of corridors and waste of area, and virtually gives a series of separate houses with but two suites on each floor, thus giving privacy to the occupants not otherwise to be obtained. One of the most important features of Trinity Court is the private school. This school will be equipped with a chemical and physical laboratory, beside a large playroom, six large classrooms and one school-room, lighted on both sides, with perfect ventilation, and capable of seating 125 pupils. On the first floor, at the left of the main entrance, is the public restaurant, and beyond, on the northerly side of the courtyard, are two large dining-rooms for occupants of the building. Beyond, on this side, is a space to be used for apartments or club-rooms at Trinity-place end, and a private school, and on the southerly side a number of club or society meeting-rooms. The second, third, and fourth floors contain 24 apartments each, these being of two, three, and four rooms and bath, each with large closets and open fireplaces in the parlours. There are no light-shafts or wells in the building, every room and bath-room being an outside room. On the top floor are apartments at both ends, while the sides of the court between are arranged for studios, all being accessible from the elevators by corridors carried around to the southerly sides, with studios at the north with skylights in the roof. These studios are arranged the same as single studios, with an alcove and toilet-room, and others with living-room, bed, and bath-room. The material of construction will be rough red brick of carefully-selected colour, laid in white mortar, with trimmings of Ohio buff sandstone. The roof will be covered with a light-green slate, while the roofs of the dormers will be of copper. The courtyard will be asphalted, with sidewalks of yellow tile. The total cost of the new structure will be over £70,000, exclusive of land. Messrs. Ball and Dabney, of Boston, Mass., are the architects. We are indebted to the *American Architect* for these illustrations.

## CHIPS.

A new Friends' meeting-house is to be built at Coventry. There will be school and classrooms attached, the total cost being £2,500.

The file cutters of Manchester and district, owing to the briskness of trade, are pressing their employers to return to the "full price" which was departed from over 20 years ago.

The plans for Mr. Beerbohm Tree's new theatre have been approved. The theatre will accommodate 1,345 persons. The building will have a frontage of 86ft. in the Haymarket and 145ft. in Charles-street.

Northwich is about to be provided with technical schools. Mr. William Molyneux, of Northwich, is to be the builder, his tender of £5,800 having just been accepted.

In the ventilation of Rosemount United Presbyterian Church, Aberdeen, now being erected to the designs of Messrs. Ellis and Wilson, architects, Aberdeen, the "Climax" patent direct-acting invisible roof ventilators are being used and supplied by Messrs. Cousland and Mackay, ventilating engineers, Glasgow.

At a meeting of the Chatham Town Council last week, the mayor reported that he had seen the architect, Mr. Bond, with reference to the plans of the new town hall. He hoped that the new foundation-stone would be laid by the Duke of York about the middle of October.

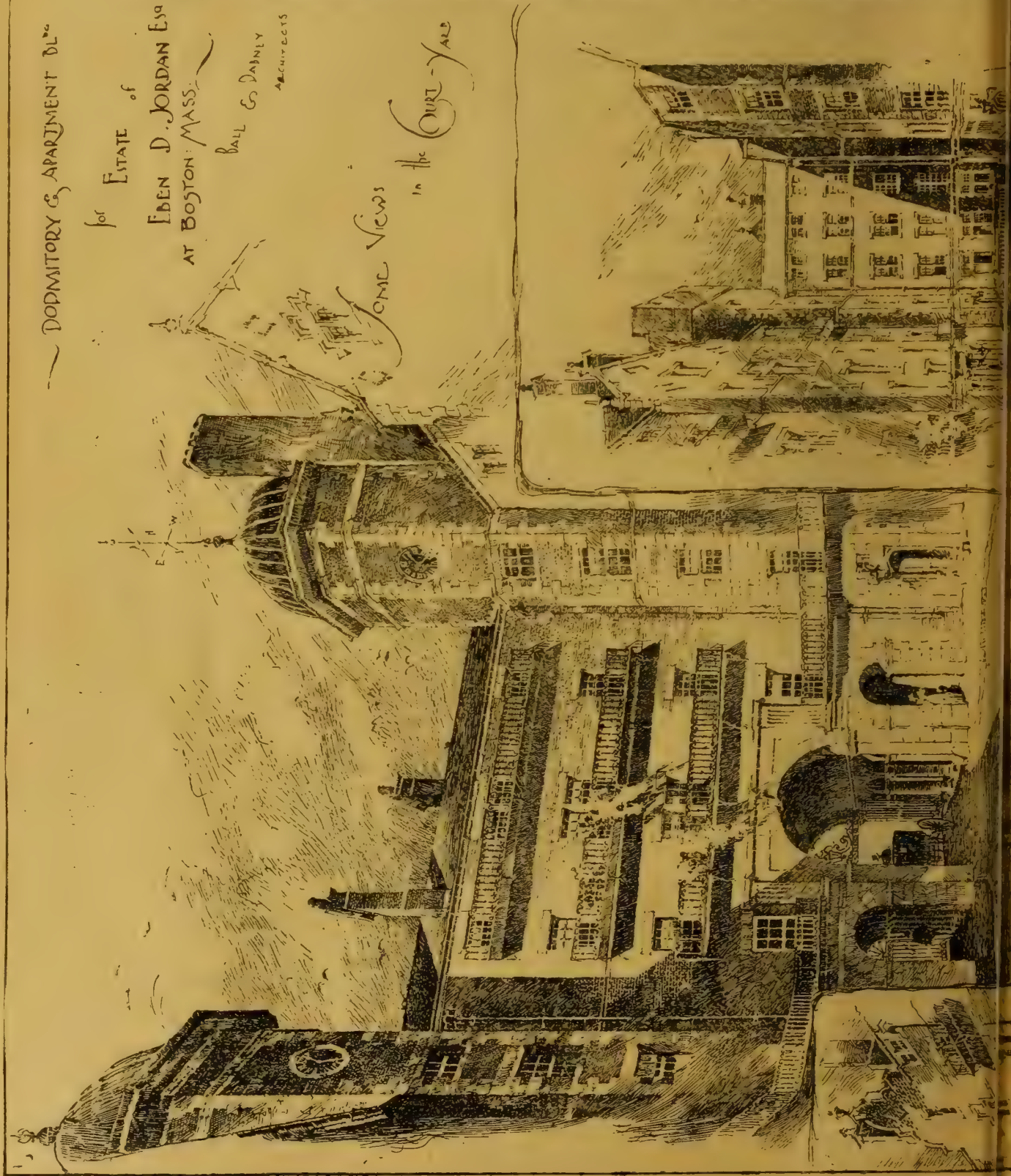


DORMITORY & APARTMENT BLDG

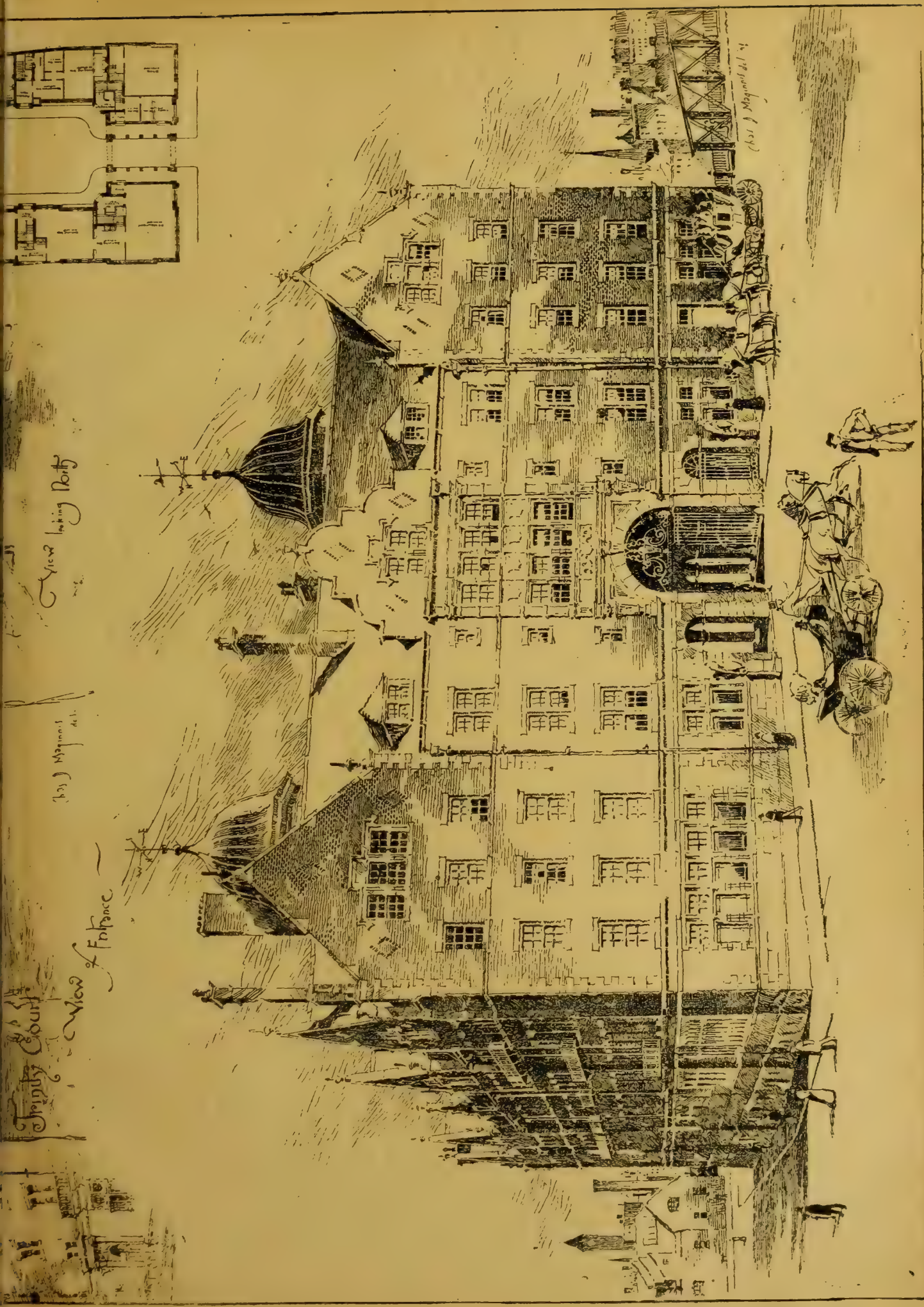
for ESTATE of  
EDEN D. JORDAN Esq  
AT BOSTON, MASS.

BALL & DASHLEY  
ARCHT & ENGRS

Some Views  
in the Court-Yard







Trinity Court

View of Entrance

View looking North

J. J. Maguire del.

J. J. Maguire del.



## Building Intelligence.

**BRISTOL.**—The foundation-stone of the new Salvation Army citadel at Bristol was laid on Saturday last. The principal frontage is to be in Ashley-road, and will be of red brick with freestone dressings, whilst the embattlements and style of architecture are to be in harmony with the name given to the structure. The chief meeting-hall is to provide accommodation for from 1,800 to 2,000 worshippers. In addition, there will be a small hall to accommodate 500 children in classes, and beyond this several vestries or smaller rooms for the use of the bandmen, officers, and others. The building has been intrusted to Mr. T. Morgan, of Wood Green, London; whilst the architect is Major Gordon, of the S.A.

**EDGTON.**—The parish church of Edgton, after thorough restoration, which has been carried on during the past ten months, was reopened for divine service on Sunday week. Portions of the walls of the old fabric had to be pulled down, owing to their dangerous condition, and rebuilt. The roof is new, matchboarded with pitch-pine, felted, and covered with the best Ruabon tiles. Six new windows have been put in. The east window geometrically worked with stained glass, in which appear the emblems of the Four Evangelists and the figures of three angels. The old turret, which was constructed of wood, has been superseded by one of stone, in which now hang the two old bells cast the latter end of the sixteenth century. In the chancel, new choir-stalls, made of oak, have been added, and a new oak pulpit; whilst the floor has been laid with encaustic and tessellated tiles, the old flags which formerly covered it having disappeared. A new vestry has also been built. The plans were prepared by the vicar, and the cost of the work has been estimated at £1,000.

**FELIXSTOWE.**—The opening of a new Wesleyan church at Felixstowe took place on Thursday, June 11. The church is in the Decorated Gothic style, and is divided into nave and aisles and north and south transepts, whilst the exterior is of Kentish rag random work, with Bath stone dressings and Ancaster weatherings. The interior is 70ft. long by 38ft. wide, the height being 14ft. on the aisle walls and 30ft. at the apex of the ceiling. The benches are for 450. In its present state the church forms part of a scheme which, when completed, will have a gallery at the west end with staircase from the southwest porch, and a square clock-tower, finished with spire to the height of 100ft. There will also be the addition of a chancel and organ chamber and a deacons' vestry. The whole work has been designed by Messrs. Eade and Johns, architects, Ipswich, and carried out by Mr. Thomas Ward, builder, of Felixstowe.

**GOSFORTH.**—The foundation-stone of a new home for destitute crippled children was laid on Friday last. It is being erected from the designs of Mr. Edward Shewbrooks, F.R.I.B.A., architect, of Newcastle, whose plans were selected in competition by local architects. The new buildings will provide accommodation for 73 boys and 37 girls, and the necessary staff; and will comprise day-rooms, reading and committee-rooms, master's and matron's sitting-rooms and bedrooms, large schoolroom and classroom, dining hall, kitchen, and other domestic offices, lavatories and cloakrooms, tailors', basket-makers', and shoe-makers' shops, laundry, washhouses, &c. The architectural treatment will be simple and Classic in style. The elevation will be faced with red Choppington bricks, relieved with Kenton stone dressings. The contractor is Mr. S. B. Burton, Newcastle.

**KEA.**—The new church at Kea, near Truro, which has been erected from designs by Mr. G. H. Fellowes Prynne, was opened last week. The main dimensions are—nave 47ft., width of nave 21ft. 6in.; total width of church, with north and south aisles, 40ft.; chancel, 21ft. 6in. by 32ft. The style is a free treatment of the Perpendicular. The principal material used for the walls is stone from local quarries, Calenick and Poltesco, and a stone of yellow tone from a newly discovered quarry at Kerley. Outside the dressings are granite. The nave arches, which are of wide span, are decorated with carved pateræ. The builder of the church is Mr. Arthur Carkeek, of Redruth, who has carried out all his work admirably; and Mr. Jones has been a vigilant clerk of the works.

**LONDON.**—The new offices of the Temperance Permanent Building Society, at No. 4, Ludgate Hill, occupy the site of the old premises. The building comprises a basement and five floors. Upon the ground floor are the public office, two private offices, and lavatory accommodation. The general office is fitted with counters, desks, and screens, all of selected wainscot oak and mahogany. The floor outside the counter, as also the lobby and staircases, are laid with terrazzo marble mosaic, and the remainder of the floor is of oak blocks. The walls and columns throughout this floor, and the whole of the staircases, are faced with Burmantofts faience. The basement contains a large office in front, and in the rear a series of strong-rooms, a boiler room for heating purposes, and lavatory accommodation. The board room is on the first floor in the rear. The front elevation on Ludgate Hill presents a bold design in the style of the German Renaissance, arranged in a scheme of colour in which brown Portland and red Duffries stone are massed against each other. The buildings and fittings have been designed and carried out by Mr. Rowland Plumble, architect, F.R.I.B.A., of 13, Fitzroy-square, W., the builders being Messrs. E. Lawrance and Sons, of City-road, N.

**THE PASSMORE EDWARDS COTTAGE HOSPITAL, TILBURY.**—This building, which will be opened to-morrow, is the gift of Mr. J. Passmore Edwards to the labouring population of Tilbury and Grays. The accommodation consists of a surgeon's room, 15ft. by 12ft., with dispensary adjoining; matron's room, 15ft. by 12ft.; with nurses' sitting-room adjoining; two single wards, each 12ft. by 10ft.; and two three-bed wards, each 21ft. by 15ft. A building two stories high is placed in the rear of central hall, containing kitchen and offices on the ground floor, and matron's, nurses', and servants' bedrooms on the first floor. This block is connected with the main building by means of a cross-ventilated lobby, every effort being made to separate the residential part of the building from the hospital proper. The building is faced with red brick and Bath stone dressings, and the roof is covered with green slates. The architect is Mr. Rowland Plumble, F.R.I.B.A., 13, Fitzroy-square, W.; and the builder Mr. J. Brown, Grays, Essex. We gave an illustration of the building in our issue of Oct. 25 last year, the day before the foundation-stone was laid.

### CHIPS.

With the exception of the plumbers, the building trades continue well employed, according to the *Board of Trade Journal*, the percentage of unemployed in unions making returns being 1.6, compared with 1.5 in April, and 2.5 in May of last year.

Mr. Batsford will shortly publish a complete facsimile reproduction of Heppelwhite's rare folio book of furniture designs issued in 1789, and entitled "The Cabinet Maker and Upholsterers' Guide." The original book contains 127 engraved plates illustrating nearly 300 designs for every article of household furniture.

Hermon, the new Welsh Calvinistic Methodist Chapel at Penrhinwceiber, was opened for public worship on Saturday week. The new building provides accommodation for 800 persons. The contractor was Mr. T. Rees, Merthyr Vale, the architect being Mr. D. Roderick, Aberdare. The total cost is about £4,000.

The St. Andrew's new schools, Ashton, which have been in course of erection since August, are now completed. The work has been carried out by Mr. John Christian, under the personal superintendence of Mr. T. Harrison Myres, F.R.I.B.A. (Myres, Vevers, and Myres, architects), of Preston.

Warrant was granted to the kirk-session of St. George's Church, Charlotte-square, Edinburgh, at the Edinburgh Dean of Guild Court last week, for certain important alterations on the fabric, which it is expected will cost close upon £4,000. The principal alterations are to be made on the apse, where the organ, choir, and pulpit are situated. In the new plans, which have been prepared by Messrs. Leadbetter and Fairley, it is proposed to divide the organ in two, putting one-half in the south-west corner of the apse and the other in the north-west. In the basement, too, some extensive improvements are to be made. The caretaker's house is to be removed from the edifice altogether, in order to allow for the enlargement of the minister's vestry, which at present is quite inadequate, and the unused cellage is to be utilised in providing separate vestries for the ladies and gentlemen of the choir, heating chambers, lavatories, electric-light room, organist's room, &c.

### PARLIAMENTARY NOTES.

**PROPOSED IMPROVEMENTS IN KENSINGTON.**—The Kensington (James-street area) Improvements Bill on Monday passed the committee of the House of Commons presided over by Mr. J. W. Lowther, Chairman of Ways and Means. The Bill, which is promoted by C. W. Simson and G. R. Mewburn, has for its object the construction of a new street commencing near the south-east corner of Kensington-square and terminating near the west end of St. Alban's-road, a second street commencing at the same place and terminating near the junction of Kensington-court, Little Charles-street, and Charles-street, and the widening of Charles-street and the western end of St. Alban's-road.

### WATER SUPPLY AND SANITARY MATTERS.

**CRAIGMADDIE RESERVOIR.**—One of the most important undertakings of the municipality of Glasgow was completed last week by the formal opening of the New Craigmaddie Reservoir, which is situated on the uplands of Milngavie, a few miles to the north-west of the city. In ordinary circumstances the citizens of Glasgow will now be placed beyond any probability of a water famine for at least three-quarters of a century. The total cost of the aqueduct is estimated at £558,690. Four new mains will be led from Craigmaddie Reservoir to the city, but meantime only two of these have been laid down. The cost of the piping has been £90,744. The Act of Parliament for the construction of the new reservoir was got fourteen years ago, and the works have been in hand all that time. The reservoir will have a water surface of 86½ acres, and an available depth, for the supply of the city, of 40ft., and at that depth will contain 700,000,000 gallons. The cost of the reservoir, including land, but exclusive of interest, has been about £300,000. When the raising of Loch Katrine and Loch Arilet are completed, the whole works are estimated to cost £1,304,846, or about £100,000 in excess of the Parliamentary estimates. Mr. James M. Gale is the engineer to the water trust.

**KINGSWOOD.**—Twenty-eight engineers have made application to submit plans for Kingswood drainage, the applicants hailing from London, Birmingham, Bristol, York, Clevedon, Mangotsfield, &c. On this question Mr. T. J. Fitzmaurice intends to move at the next council meeting: "That it is eminently desirable in the interests of the ratepayers of this district, as being more conducive to true economy and efficiency, that an engineering expert be appointed to adjudicate and report upon the plans and estimates which may be submitted to this Council re the drainage of Kingswood urban sanitary area."

**LEEDS.**—At a meeting of the Leeds Waterworks Committee last Friday, a sub-committee reported the result of their negotiations with the owners of various properties at the head waters of the Washburn, where land is required as the site of a proposed new high-level storage reservoir for the city. For some months past the special sub-committee, who were appointed to make inquiries into this matter, have been busily engaged ascertaining the terms upon which the owners of certain land at the head of the Washburn Valley were disposed to part with their property. The sub-committee reported yesterday what they had done, but stated that as yet they were not prepared to make any definite recommendation, as they had not quite concluded their negotiations. The committee requested them to present a report at an early date. It was reported that as the result of an interview with the Local Government Board officials, by the chairman, the town clerk, and the city engineer, the permission previously given to the corporation to construct a service reservoir on land belonging to the Low Moor Company at Harehills, Leeds, had been transferred to a site belonging to Earl Cowper. The city engineer was instructed to obtain tenders for the work. The committee decided to ask the Local Government Board for power to borrow a further sum of £50,000 in connection with various works the committee have at present in hand.

Messrs. E. H. Shorland and Brother, of Manchester, have recently supplied their vertical inlet tubes and other ventilators to the New Tabernacle, Woolwich.

The new school erected by the Bilton and Starbeck School Board at Harrogate was opened last week. The school consists of a central hall 85ft. by 35ft., nine classrooms, lavatories, and cloakrooms, together with a cooking-room and scullery attached. The style is Tudor, and the estimated cost of the building is about £6,000.

A richly-carved rood screen and pulpit have just been set up in St. John's new church, Watford. This screen and upper part of the pulpit are executed in wainscot oak, the base of the pulpit being stone. They were carried out from the drawings of the architect of the church, Mr. Eley E. White, by Mr. Forsyth, of Finchley-road, Hampstead.



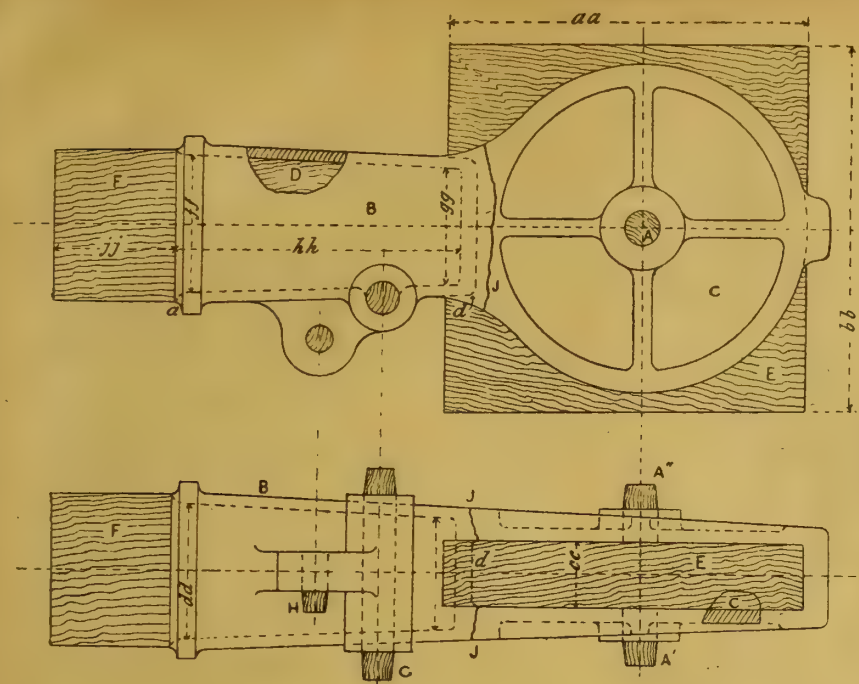


FIG. 112.

## CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXVII.

By JOSEPH HORNER.

CONTINUING our study of the moulding from broken castings:—The patterns of gear wheels, used so largely in hoisting machinery, are expensive, and few foundries possess an extensive stock from which to make selection. Yet the castings are very liable to fracture, the teeth sometimes going, sometimes the arms or boss. A toothed wheel or pinion which is shrouded in top and bottom, whether half shrouded (that is to the pitch circle), or whole shrouded (that is to the tooth points), cannot be moulded from directly. But a swept print, and core-box containing teeth, similar to the print and box illustrated for the broken sheave wheel in the last article, can be used. Or the bottom shroud might be turned off and a loose wooden one substituted. But wheel-teeth often break because they have become worn very thin, and then their castings are not suitable for moulding from; first because the teeth are too thin, and second because they are seldom worn equally. Sometimes I have seen them when worn moulded from, and the teeth made up to size in the mould by using mending-up teeth of the proper section to lay in the mould, the pattern-teeth being similar to those used in mending up any broken wheel-moulds. But the result is seldom satisfactory, the casting being always more or less inaccurate.

But there are many cases in which wheel-teeth, while still comparatively unworn, break by reason of sudden shock, and occasionally arms and rim also break. As wheel patterns are expensive, such broken castings are often brought to the foundry to be moulded from. To prepare them for moulding, any grease or oil or dirt adherent are first burnt off in a clear coke fire (as, indeed, is always done with broken castings brought for moulding), the surfaces rubbed a bit with emery-cloth, and well varnished with shellac varnish. If the fractured parts are heavy, there is no attempt made to fasten them together; they are simply laid in place in the sand, and sand tuckered around to keep them in position during ramming. In some cases fine wire or twine will be wound round to retain the parts in place, and removed as the ramming proceeds. But if small portions only, such as teeth, are broken off, these are stuck on with a solution of shellac varnish and powdered chalk, or with coaguline. If any of the broken parts are lost, they are replaced in wood.

When neither of these methods is practicable, then attachments of wood to metal are made by drilling holes in the broken casting, filling them up with plugs of wood, and nailing or screwing the new parts into these plugs.

One point is very essential when taking moulds from broken castings, and that is that the parts must be laid accurately in their relative positions;

straight-edges, winding strips, and rule must be used to test this matter. It is easy, when ramming an article in the floor, to get the parts out of truth, and so make crooked and winding castings. In many cases a level bed of sand will afford accuracy in one direction. If an article is not absolutely level, but is so in the main, then the level bed of sand is necessary, and holes will be dug in it to take those parts that project beyond the general plane. This, however, concerns the moulder.

Among the simplest castings that can be moulded from are brasses and bearings of

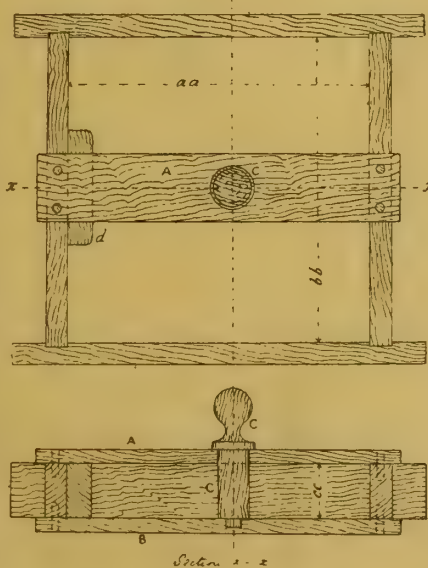


FIG. 113.

ordinary kinds. The only difficulty is in the due allowance for machining, as boring and facing. In very small work a slight increase in size can always be made by excessive rapping. Or a careful moulder can scrape out the mould a little larger with his trowel, or with a cleaner, with or without the aid of thickness strips laid in the portion to be machined. The safer way, however, is to line up the portions that have to be bored or faced with sheet lead, or with thin leather or wood. The linings need not necessarily be fastened to the broken casting. If laid against it in the mould that is sufficient.

A common belt-pulley can be moulded from easily enough. The allowance for turning would be given by laying thin strips of wood around

the outside of the rim, and the moulder, guided by the thickness of these, would scrape out the mould so much larger than the broken casting. But a wide pulley with double arms could not be moulded without making a core-box to take out the space between the arms. All the rest will deliver freely. It would, however, cost less to make a core-box than to make an entire pulley pattern. Of course, I am supposing that a pattern would have to be made outright, as it would in some districts. But many shops keep pulley pattern rings, and sets of arms of all sizes, and then it would be cheaper to mould from one of these than to make a core-box for the broken casting.

I will conclude this section of the subject by taking a casting which is liable to fracture, and which affords an excellent example of the utilisation of cores for forming recessed portions. The whole of the corresponding dimensions in prints, casting, and core-boxes are similarly lettered, so that it is easy to trace out the coincidence of parts.

Fig. 112 is the top casting of the jib of a builder's derrick crane, in which runs the hoisting pulley, the pulley-pin passing through the hole A. The socket B receives the end of the timber jib. Should such a casting fracture by accident, as it is liable to at JJ, it may be cheaper to mould another from it than to send a long way off to the makers for a duplicate. To prepare it for moulding, the two recesses, C for the pulley, and D for the end of the timber jib, must be filled up, and the filling-up blocks extended to form core prints E and F respectively. Round prints will also be wanted to core out the small holes in the casting, as A' for the pulley-pin, with  $\frac{1}{4}$  in. allowance for boring, and G and H, G being the hole for the sling rods which connect to the chains for derricking, and H being the hole to which the fast end of the lifting chain is attached, the chain being double, forming a loop or bight for the snatch block and pulley.

Fig. 113 is the core-box, by means of which the opening for the lifting pulley is cored out. It is plain rectangular, of the same length, aa, and width, bb, and thickness, cc, as the print E. It is framed together as shown, in the fashion usual with boxes of this type. d is a block which forms the metal shown at d in the casting at the end of the hole for the jib.

The hole A for the pulley pin can be cored in two ways. A print can be put on at A' and also one at A'', and short round cores be placed in bottom and top of the mould, abutting upon the main core made from the box in Fig. 113. But generally in cases where cores situated at some

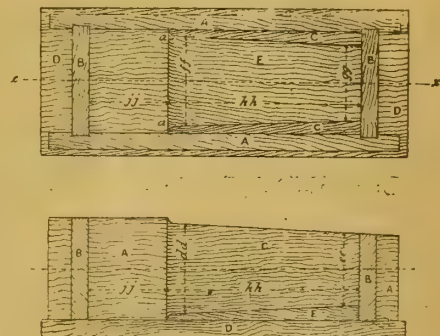


FIG. 114.

considerable distance apart have to be in alignment, the plan adopted is to avoid the use of separate short cores, and put in one long one through the main core to core out both holes. There is, then, no risk that the holes will not be true with one another. This is the method shown in Fig. 113. Two strips, A and B, dowelled upon the faces of the core-box, and a pin, C, of the same diameter as the central round core is passed through holes bored in these strips and in the correct position in relation to the sides of the core-box.

Then, after the main core is put in place in the mould, a round core of the same size as the pin C is thrust down through the main core and into the print A', standing also sufficiently high above the main core either to abut merely against the top face of the mould or to enter into a round print impression A'' in the cope.

The core-box for the timber socket is shown in Fig. 114. The recess in the casting is not only



tapered, but it is also provided with rounding edges to avoid shouldering the timber down into a keen angle. This is the reason why the print F in Fig. 112 is larger than the actual hole, and is also the reason of the formation of the similar edges, *a*, in Fig. 114. Moreover, on account of the taper of the hole the best plan is to make the box as shown, with sides, A.A. and ends, B.B. and separate tapered pieces, C.C. Also a bottom board, D, is necessary here to carry the bottom tapered piece E. The taper and rounding termination of the top of the core is formed by stricking it along the top edges of A.A. The correspondences of the casting and core-box are indicated by the letters *dd, ee, ff, gg, hh, jj*.

I have now done with the purely practical part of this subject, and propose in the concluding articles to consider the methods of calculation of strengths of castings, and the chemistry of cast iron.

## PUBLIC WORKS IN HANLEY DURING THE PAST TEN YEARS.\*

By JOSEPH LORLEY, M.Inst.C.E., Borough Engineer and Surveyor, Hanley.

IT is not the intention of the writer to attempt a complete statistical record of the ordinary routine of the borough engineer's department, but simply to give a short description of some of the principal works carried out since the annual meeting of this association held in Hanley in July 1886.

### SEWAGE WORKS.

In May, 1881, a district meeting of this association was held in Hanley, and a paper was read by the present writer on the Hanley Sewage Works, which had then recently been opened. Members are referred to Vol. VII. p. 58, for this description, and it will only be necessary now to shortly describe the extended works carried out since that date. An additional precipitation tank measuring 200ft. by 100ft. has been constructed. About 19 acres of land has been purchased, extending the property of the corporation close up to the boundary of the borough along the valley of the Trent near Stoke station. This land is reserved for filtration areas. Four sludge presses, with air compressor and circular sludge tank and other appurtenances, together with the new buildings required, have been erected. Plans have been approved by the Local Government Board, and the work shall be shortly taken in hand for dealing with the small outlying districts which are below the level of the existing intercepting sewers. It is proposed to lay down the Shone system for these districts, which, although small, are a considerable distance from each other, extending from a mile to the south-east to a mile to the north-west. An additional air-compressor will be erected at the sewage works, and will probably be driven by electricity, thus affording some work for the electric-light engines and boilers during the daytime and after midnight. Since the beginning of May, the consent of the town council having been given to the experiment, the Bacillite Sewage Purification Syndicate have had arrangements in progress for dealing with the sewage. At the present moment it cannot be known positively whether sufficient work will have been done to enable the members to form any opinion on the merits of this system.

### HANLEY TOWN HALL.

When the annual meeting took place in 1866, the members then present were able to see the alteration effected in the front part of the building to adapt it for municipal purposes, also the new police cells. The new Quarter Sessions Court was then in course of erection. In 1887 the writer was instructed by the council to prepare plans for an assembly-room to be built upon what was then the bowling-green, together with accommodation for the School Board Offices. His instructions were (1) to erect as large a hall as the site would permit; (2) the room to be good acoustically for music or public speaking; (3) the cost not to exceed £8,000. This was a problem that had rarely been faced, but the members will be able to see the result. The building has been erected and furnished for £10,000 complete. The external appearance is designed in keeping with the remainder of the building. The hall will accommodate 3,000 persons, including promenade standing room. For political meetings or other

large gatherings, by removing the chairs from the ground floor, over 5,000 people have been present at one time. Very little has been attempted as regards decoration, that being left to be dealt with in the future. The ceiling is elliptical in section, but part of the roof timbers and tie-beams come down below and are visible. Until the design is fully carried out as regards decoration, these timbers certainly do not present a very good appearance. The object, however, of their existence, in lieu of any other form of roof and ceiling, has been obtained, as the acoustical properties of the hall when filled, both as regards music and public speaking, have given general satisfaction. The writer's plans were submitted specially on this point to Professor T. Roger Smith and received his approval, with a report that the proportions of the room were likely to produce good acoustical results.

### FREE LIBRARY.

The late borough offices have been converted into the Free Library. This work was in progress at the annual meeting in 1886. Since then the cellar under the reading-room has been deepened, tiled, and furnished as a boys' reading-room. The museum is located in the former large room of the Mechanics' Institution. It was commenced as the North Staffordshire Technical Museum, but failed to be self-supporting, and has been since taken over by the corporation, the admission being free.

### THE HIGHER GRADE SCHOOL.

This building, which the members will have the opportunity of seeing, has been carried out from designs by Messrs. Scrivener and Sons, architects, Hanley, and is considered well adapted to the purpose of higher education.

### BUTCHER'S MARKET.

A new stone front, together with an entire new roof, has been constructed for this market; the back-yard, which was inclosed by a wall and other outlying buildings, being removed and thrown open to the street.

### HANLEY PARK.

At the time of the annual meeting here, Hanley had no park; indeed, no sign existed that there was likely to be one within a measurable time. The movement to secure land for a park before all available and accessible areas were built upon began in 1889, and rapidly found favour. The proposition to purchase land for a park on the southern half of the borough was accepted at a large meeting of ratepayers, coupled, however, with the understanding that the north-eastern and north-western parts were also to be provided with smaller parks. The park at present in course of formation consists of 104 acres, 24 of which is left as a fringe outside the park, and is offered for sale for building residences. A portion of this land on the north side has been recently sold and has realised good prices, the amount obtained being over £8,000.

### HANLEY ELECTRICITY WORKS.

A provisional order was obtained in 1891, enabling the corporation to lay down mains and erect buildings and plant for the supply of electrical energy within the borough. The author visited America in the autumn of that year, and made special visits to the electric-lighting stations in towns of about the same size as Hanley, in order to make himself acquainted with the general business engineering arrangements required. It will be remembered that at that time there were very few examples of that description in this country. The designing and carrying out of the buildings, lines of mains, erection of generating plant, and all works in connection therewith, has from the first been intrusted to the author. In September, 1892, the council entered into a contract with the Brush Electrical Engineering Company for the boilers, engines, dynamos, mains, and sub-station transformers requisite to deal with the compulsory area lighting, both public and private, in its first stages, the system adopted being that known as high-pressure alternating current, with transformers at sub-stations, from which low-pressure distributing mains are laid to consumers' premises. The reasons that influenced the council in selecting this system as against a continuous-current scheme, as being more suitable for a district like Hanley, were principally: (1) The works could be placed away from the centre of the town, and where land is less valuable; and where, consequently, extensions could be more readily made

as required. (2) The north-easter corner of the park estate, adjoining the canal, was available as the site for the electricity works, and will be found to be very conveniently situated and but little removed from the actual centre of the area of supply. Further advantages accrue from its proximity to the canal, for the supply of coal and water for condensing engines. The high-pressure mains are concentrically arranged in one cable with insulating material between the two sets of copper strands, the whole being insulated and protected by outer coverings. This cable is drawn into cast-iron pipes, forming a ring main from the works *via* Bethesda-street and Piccadilly and the Market-square, and returning *via* Tontine-street and Lichfield-street. The low-pressure distribution mains are not concentric, but are laid double in cast-iron troughs, afterwards filled up solid with pure bitumen. The capacity of these mains is practically increased to any extent desired by reducing the area served by them: this is done by adding transformer stations at the points of most demand. In carrying out the works, the author has been ably assisted by Mr. G. H. Cottam, the corporation electrical engineer, who had the running of the works in his charge until he received the appointment of chief electrical engineer to the Hampstead Vestry, and also by Mr. C. A. Cowell and Mr. C. J. Sutherland, who were appointed, last September, electrical engineers and joint managers under the general direction of the author. Regarding the financial aspect of the undertaking, the ratepayers have every reason to be satisfied with the prospects. Not only did the works conclude the first completed year on December 31, 1895, with a balance in hand after paying all expenses, including interest and redemption of loans; but on December 31, 1894, with practically less than six months' running, there was a favourable balance, after discharging all obligations, including a whole year's interest on loans. The price charged per unit is 5d., current for motive power is offered at 3d., and to churches, &c., for Sundays, at 4d. The Town-hall, baths, Free Library, museum, general market, fish market, butcher's market, School of Art, Higher Grade School, St. Mark's Church, and the public clocks at the old Town-hall and Shelton Church are lighted throughout by electricity.

### HOT WATER.

THE term, 'Warming Buildings by Hot Water,' though literally correct, conveys "a completely wrong idea of the results. Individual ideas differ in this; but where nearly all are wrong is in supposing that the source of warmth is perceivable, as is the case with other methods of heating. A house properly warmed by hot water has the atmosphere, perpetually, of a still summer evening, and in this statement there is no exaggeration whatever. . . . The Englishman's love of an open fire and its cheerful blaze is another literal truth without a correct meaning, for no one seeks, or enjoys, the cheerfulness of a fire with the thermometer registering 65° to 70°. . . . Perhaps the greatest benefit of this method of heating is the total absence of disagreeable, and no less hurtful, draughts of cold air. There is no reason why an entrance-hall, staircase, or landing should be lower in temperature than within the rooms of a residence, and this without impairing ventilation."

The above is an introduction that appears in the catalogue of Fredk. Dye and Co., heating and general hot-water engineers, of 58, St. Paul's Churchyard, London, E.C., a catalogue devoted entirely to the wants of the hot-water engineer, including everything from boiler to expansion pipe, both for heating works and hot-water supply.

Mr. Dye, whose contributions on hot-water works have appeared at times in this journal and in the *English Mechanic* for some years past, is perhaps better known as an author than a practising engineer (his name also appearing on the title-page of "Hood on Warming Buildings"); but this has been largely due to his directing the affairs of the Eagle Range and Foundry Co., Limited, in which firm his personality has been to some extent submerged. Although still acting as a director to that company, he is now carrying on a distinct business at the address given, and the catalogue we have before us is published in his name.

At first thought it seems unnecessary for an

\* A paper read before the Incorporated Association of Municipal and County Engineers, at Hanley, June 13, 1896.



engineer practising hot-water works to issue a full catalogue of hot-water fittings and appliances. A catalogue or price list of any special goods is usual; but it is explained that this list is the result of suggestions from architects and others. Architects and also the building trade may prefer to have their hot-water goods all from one house instead of going to three or four, as is commonly necessary, and experience some satisfaction in having them from a firm who use the goods themselves in their daily practice. It is also satisfactory to some to feel that they are thus in contact with an engineer who will give assistance when knotty points have to be overcome. More importantly, perhaps, the list has its prices corrected and reduced to one uniform discount, so that it becomes a most useful book of reference in compiling estimates or prime cost. Hot-water goods have most varying discounts, sufficient to perplex those who are not continually pricing them. Steam-tube at a discount somewhere about 55 per cent.; radiators at something considerably less; brass



FIG. 1.

cocks at 15 per cent. Tanks and cisterns have varying list-prices, as well as discounts, amongst the different makers, so that a list in which all the goods appear at a uniform price is convenient, and is, in itself, a work of no small labour.

A feature about the catalogue that is sometimes thought to show a want of patriotism is in the introduction and recommendation of some American-made goods. Mr. Dye excuses this by saying that he only uses, or considers others would use, what is best for a certain purpose, or to effect given results. Take pipe-fittings for instances: the catalogue includes a price-list of English-made fittings, also American malleable cast and soft-cast fittings, three distinct kinds. In favour of the two latter it is said that their shape is so superior, and the finish better as to detail. Every elbow has a sweep equal to a bend; then there are 45-degree branches and elbows, Y-fittings, bushings, eccentric reducing sockets, and the several other forms that a hot-water engineer best knows the value of.

With radiators, the American makes have favour, owing partly to the method of jointing the sections, and, secondly, to the ornamental design. It is considered that one of the chief bars to the progress of hot-water works in England has been the severe character of the radiators designed in this country. They are scarcely tolerated in an entrance-hall, and except in a few instances, they are denied a place in a dining-room, to say nothing of a drawing-room or boudoir.

Fig. 1 illustrates the "Dysart" radiator of

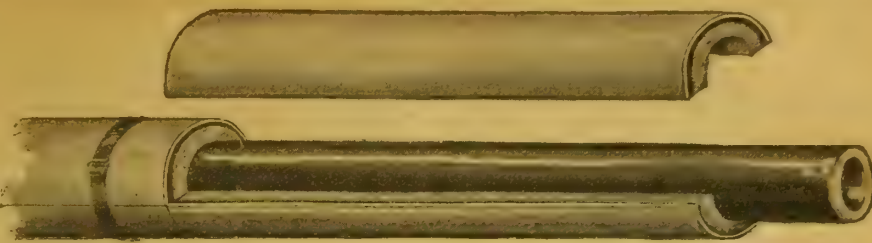


FIG. 2.

American make, but quite new, and not even on the market in its native country yet. The design is the work of an Italian artist of some repute, and is of a very tasteful character. Its style of ornamentation is to some extent unsuited for institution work, having been introduced expressly for residence work; and decorated white japan, with the detail in a colour to harmonise with its surroundings, it has much the appearance of porcelain. Other radiators of more conventional design are recommended for general purposes.

In boilers again the leaning is towards American principles, if not manufacture. Space can only be afforded here to mention that the sectional type is shown, but the principle involved is peculiar. Each section is an independent boiler; not only can the sections be easily transported into basements, &c.; but in event of a breakdown any section can be thrown out of use in one hour, and the fire lighted again to continue its work. This is a convenience, for whenever a failure transpires, it is always when a boiler is in full use and much wanted.

The remainder of the catalogue, some three-fourths of it, shows English-made goods, and gives some useful information in connection with them. One special material we can mention is "Dye's Improved Pipe-Covering," as Fig. 2. This consists of pairs of stiff half-round channels, lined with purified hair-felt. Hair-felt stands high, close to eiderdown, as a poor conductor of heat; but hitherto its adoption has been prejudiced by the method of application. The usual way of applying it is in strips of sheet felt wound round the pipes, which, although simply done, left the job much wanting in sightliness. This covering having a stiff exterior, and being secured by metal bands, is easily put up, has a good appearance, and can be painted if desired. Any length can also be taken down very easily in event of leakage.

A notice in the catalogue announces that a price-list of brass radiators is being prepared. This is a step of some importance in hot-water heating, for there is no disguising that for residence work the average English householder does not look kindly on the majority, if any, of the iron radiators on the market. Some iron radiators lend themselves to excellent decoration, and when shown finished in this way, the prejudice often disappears. With brass radiators there should be no objection to their appearing anywhere, for it has to be pointed out that so very many designs are practically on hand. Brass tubes are rolled, and every tube-maker's list shows some fifty different patterns. Caps and bases to the tubes can be had in variety, and the top and bottom water-ways are also rolled. We are informed that the first pattern now being constructed will be of 2in. reeded tubes, with Corinthian caps and bases. This, lacquered deep gold colour, should prove very effective, and fill what is a decided want. For iron radiators, the catalogue contains a colour sheet of radiator enamels. It is essential that the material chosen to decorate a radiator be, in itself, a good radiator of heat, for effectiveness in heat radiation lies in the outer surface, or skin, of the radiator. This sheet is made up entirely of delicate art colours. Iron radiators will seldom bear deep colours effectively, yet maroon or Indian red is one of the commonest colours used. Nothing could more effectively spoil good results. Two shades of very pale mauve, though a daring colour scheme for a radiator, has a surprisingly subdued yet pretty effect.

Enough has been said to show that the catalogue, though not large, is comprehensive of the hot-water engineer's requirements. And, presumably as an attraction, there is, on the back cover, a reproduction of a large wash drawing showing a domestic hot-water supply apparatus *in situ*. The apparatus is shown erected on the cylinder system, with secondary flow and return. The catalogue can be had post-free.

## OBITUARY.

MR. JOHN H. MIDDLETON, Litt.D., D.C.L., V.P.S.A., Director of the Art Museum at South Kensington, whose death from an overdose of laudanum took place last week, was born at York in 1847, and was educated first in Italy, then at Cheltenham College, and finally at Exeter College, Oxford. He was M.A. both of Oxford and Cambridge, and D.C.L. of Bologna. He was Slade Professor of the Fine Arts at Cambridge from 1886 to 1892. He had also been Director of the Fitzwilliam Museum, Cambridge, and Lecturer at the Royal Academy. He was a Fellow of King's College, Cambridge. For a time he practised as an architect. He was one of the first of contemporary authorities on ancient art, and his work on "Ancient Rome," published in 1885, takes high rank for its learning and its practical value. He further published in 1891, "Ancient Rome in 1888," and his "Remains of Ancient Rome," in two volumes, appeared in 1892. He also compiled in 1891 "The Engraved Gems of Classical Times, with a Catalogue of the Gems in the Fitzwilliam Museum, Cambridge"; and in 1892 "Illuminated Manuscripts in Classical and Mediæval Times, their Art and Technique." Dr. Middleton wrote no fewer than 84 articles in the last edition of the *Encyclopædia Britannica*, and numerous articles in *Archæologia*, the *Journal of Hellenic Studies*, and other artistic and antiquarian periodicals in England and in Italy. He was appointed Art Director of South Kensington in 1893. Dr. Middleton married in 1892 Bella, second daughter of Mr. W. J. Stillman. His loss is a heavy one. His work at South Kensington was most conscientious and beneficial, and his kindness of heart and readiness to help students and others—ourselves many times included—most noteworthy.

## CHIPS.

General regret is felt in Dobcross at the unexpected death of Mr. W. Hewkin. The deceased, who was a joiner and builder in partnership with his brother, Mr. G. Hewkin, the postmaster of Dobcross, contracted a cold some time ago, and a tumour in the head supervened. He died on Monday. He was about 65 years of age.

The Anglesey County Council, at a special meeting, have discussed at some length the question of enlarging Denbigh Asylum. Some members advised further delay, and criticised the plans, while others pointed out how necessary the provision of extra accommodation had become, and urged the council not to delay the work any longer. It was reported that the Home Secretary had decided that the present plans must be proceeded with, and the council simply adopted the report of the asylum committee, which laid the plans before the council without comment.

A movement has been started in the parish of Holy Trinity, Castle Hall, Stalybridge, for extending the accommodation of the church and making sundry improvements, a faculty having already been secured from the Consistory Court at Chester. The improvements embrace a new side chamber, an organ-chamber, a commodious parochial vestry, the enlargement of organ, &c., and the estimated cost is £1,650.

The development of the eligible building sites adjacent to the Atlantic Hotel, Newquay, has just been initiated by the commencement of a terrace of four residences on the proposed Fistral Avenue. Mr. Silvanus Trevail has leased several acres of the land here from Mr. Treffry for a long term, and the present terrace is the first instalment of a scheme embracing 50 or more high-class residences which he intends to erect. Mr. Trevail has obtained the whole of the land now occupied by the golf club, some 70 acres or so in extent, and overlooking Fistral Bay, on a 999 years' lease, and is negotiating a scheme with a London syndicate for its full development on somewhat similar lines to what has been attended with such marked success at Eastbourne and Bournemouth.



## ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**GLASGOW INSTITUTE OF ARCHITECTS.**—The Glasgow Institute of Architects propose to hold an exhibition of metal-work at their rooms, 187, Pitt-street, in October, 1896. The exhibits will include cast and wrought iron, brass and copper work, ormolu, lead, silver or other metals capable of decorative treatment. Contributions of old examples are invited, as well as the best class of modern work. Drawings and photographs of metal-work will be included. All works will be subject to the approval of the committee. As the space is limited, no large exhibits can be received. The convener of the committee would meantime be glad to be advised of the nature, size, and weight of proposed exhibits, and would report as to their suitability.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—On Saturday last the members of the Northern Architectural Association held their annual excursion, the places visited being Haggerston Castle and Holy Island. The party left the Newcastle Central Station by the express train at 9.30 a.m., Mr. G. T. Brown, Sunderland; Mr. J. T. Cackett, Newcastle (hon. treasurer); Mr. H. C. Charlewood, Newcastle (hon. librarian); Mr. A. B. Plummer, Newcastle (hon. secretary); and others being of the party. The president, Mr. A. M. Dunn, and the vice-president, Mr. F. W. Rich, were unable to be present. On arrival at Beal, the members were met by conveyances, which took them to Haggerston Castle, where Mr. Leonard Frost, on behalf of Mr. Leyland, met the visitors, and accorded to them a hearty welcome. Important additions and alterations are being made at the Castle, which were commenced nearly four years ago, and are not expected to be completed for another two years. The architect is Mr. R. Norman Shaw, and the contractor Mr. Walter Scott, Newcastle. The building is in the English Renaissance style, and is built of stone quarried locally. The additions which are being carried out consist of a circular entrance-hall, 35ft. in diameter, leading to a spacious groined corridor, at the end of which is a large glazed corridor connecting a high tower with the main building. The tower will have a smoke-room at the base, water-tanks in the middle, an observatory on the fourth floor, and a flat above. Returning to the main building, the large hall will be a magnificent room. The screen is of Denwick stone arches, faced with Irish-green columns, the top forming a spacious balcony for an orchestra. The hall will be fitted with a French springing floor, and a fixed margin, and the walls are to be panelled in walnut. In addition, there are new servants' halls, kitchens, &c., and a spacious billiard-room with a sunk panelled and coved ceiling springing off the oak wall panelling. The dining-room and library floors are to be splendidly treated with Rhodona marble pilasters, with Hopton Wood bases, and the centre staircase will be a very elaborate one. An open court, which is to be decorated with flowers, is also a feature of the castle as reconstructed. All these particulars were explained by Mr. Tom Atkinson, who represented the contractors. Having spent considerable time in the castle, the members of the association had lunch on the lawn. Taking their conveyances, the party drove to Holy Island, where they were met by the vicar, the Rev. John Bryson, who showed them through the church and priory. The first Bishop of Lindisfarne was St. Aidan, who founded the see under St. Oswald, and sat as Bishop from 635 to 652. The walls of the old Norman church are of a hard but coarse sandstone, of a dark reddish colour, and it is of this stone that almost the whole of the abbey is built. The lower part of the walls of the north transept, the north side of the nave in one or two places, and the lower portion of the west wall of the choir on the south side, are, however, pieces of masonry of a different character, and inferior to the Norman work. It is supposed that this inferior walling was part of a former church, and was left when the Norman building was set out. The many objects of interest in the church and abbey having been seen, the old castle was visited, after which the members of the party sat down to dinner at the Northumberland Arms. Mr. Atkinson and the Rev. J. Bryson were heartily thanked for their kindness during the day, and the architects crossed the sands again to the mainland, and arrived in Newcastle at 10.5 p.m. The weather throughout the whole of the day was as perfect as could be wished for, and it was generally agreed that the excursion was amongst

the most enjoyable that the association had yet held.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The annual excursion of the members of this society took place on Saturday, June 13, when a large number visited Wentworth House, by special arrangement. The party drove through Ecclesfield and Chapelton, and through the park to Wentworth, where luncheon was provided at the Rockingham Arms. Among those present were Mr. C. Hadfield (president), Mr. C. J. Innocent (hon. secretary), and others. The exterior of the beautiful seat of the Fitzwilliams was first carefully examined, and then the party had the opportunity of seeing the interior. The plans and detail drawings of the various parts of the building were produced for the use of the party, and explained by Mr. W. Dickie, the clerk of works, who has been resident at Wentworth, with charge of the works, for 33 years, with the assistance of his son, Mr. George Dickie. The new church, built at a cost of about £25,000, from the designs of Mr. J. L. Pearson, was very much admired. An adjournment was made to the Rockingham Arms, where a substantial tea was done justice to. The Mausoleum, with its famous sculpture by Nollekens, was taken on the way home.

## CHIPS.

The Working Men's Club and Institute, Swansea, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The streets and buildings committee of the Edinburgh Town Council have had under consideration a report by the burgh engineer as to the insufficiency, in view of the extension of the city in that district, of the Morningside outlet sewer, and they resolved to recommend its reconstruction at a probable cost of £7,000.

The Old Red Lion, Bushey, an ancient and celebrated inn, which is situate in the centre of the old village, is being demolished to make room for a commodious hotel, designed by Mr. Ayres, architect, of Watford.

The foundation-stone of a new parish-room for All Saints', Cockermouth, costing £1,400, of which £400 still remains to be raised, was laid last Friday.

New schools are being erected at Rainow, in Cheshire, from the designs of Mr. Aston, architect, of Macclesfield. The system of ventilation decided upon by the architect for the schools is that supplied by Messrs. Robert Boyle and Son, Limited, Ventilating Engineers, London and Glasgow.

Lord Rosebery will open the Passmore Edwards Public Library at Hammersmith on Thursday, the 25th inst., at three o'clock. The architect is Mr. Maurice B. Adams, F.R.I.B.A.

The ceremony of unveiling the statue of Lord Granville, in the Central Lobby of the Houses of Parliament in close contiguity to those of Lord Russell, Lord Idlesleigh, and Mr. John Bright, took place last week. The statue is placed immediately opposite that of Lord Idlesleigh, and represents Lord Granville at the age of about 65. The figure is the work of Mr. Hamo Thornycroft.

New National schools at Camborne were opened last week. The schools are built of elvan, and the dressings are of granite and Bathstone. Mr. Sampson Hill, of Redruth, is the architect.

Lord Provost McDonald, of Edinburgh, intimated to his committee, on Wednesday, that Mr. Andrew Usher, distiller, had informed him that he wished to provide a town hall worthy of Edinburgh, and for that purpose would give £100,000. The questions of style and site the donor has left entirely to the Lord Provost and council.

The corner-stones of a new Conservative Club at Whitworth were laid on Saturday, in the presence of a large assemblage of persons. Exclusive of the cost of furnishing, it is expected that the expense incurred in the undertaking will amount to about £1,000. Mr. Joseph Law, of Whitworth, is the builder of the new club; the architect is Mr. Norcliffe Mills, of Rochdale.

Lady Crawford laid the foundation-stone of the Church of St. John the Baptist at New Springs, near Wigan, on Tuesday afternoon. The church is being built of brick, with dressings of terracotta and stone, and will provide accommodation for about 500. It will consist of a nave, with chancel, and north and south transepts, arranged in the form of a cross, and a baptistery is provided at the west end of the nave, and carried up above the roof to form a small tower. The design is by Mr. Medland Taylor, and the general contract has been let to Mr. C. B. Holmes, of Wigan. The cost of the church and boundary walls will be about £5,000.

## TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

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## NOTICE.

Bound copies of Vol. LXIX. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXIX., XL., XLI., XLVI., XLIX., LI., LIII., LIV., LVIII., LIX., LX., LXI., LXII., LXIII., LXIV., LXV., LXVI., LXVII., LXVIII. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

NEMO.—(Stoves, and not open grates, are certainly used in most of the countries named; but in many of the better-class houses in America the English fashion of open fireplaces is favoured.)

RECEIVED.—F. D. L.—E. H. Walters.—Hon. Sec.—T. R. and Co.—E. W.—J. Sanders.—G. F. and Co.—P. E. (Battersea).

## "BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Invicta," "K. K." in a shield, "Shamrock," "Tadpole," "Fickwick," "Onward," "Pantile," "Boer," "Young 'un," "B." in a circle, "Winton," "Moor," "Brian," "Owl," "Lancastrian" (late).

## Correspondence.

### STREET ARCHITECTURE.

To the Editor of the BUILDING NEWS.

SIR,—It is very interesting to me to watch how a new kind of street architecture is replacing the old dirty stucco kind with its flat, monotonous roof-line and square openings at measured intervals. But, unfortunately, in the carrying out of this revival of the more cheerful and interesting red-brick architecture, with its picturesque possibilities in the way of gabled roofs, &c., the taste of the builders is so seldom equal to their apparently good intentions, and their nearly universal lack of individual originality, whether in good taste or bad, is quite astonishing. The type I mean differs greatly from the Tudor, Late Perpendicular Gothic (of which one occasionally sees some charming new specimens), and its already stereotyped characteristics are: a very pompous-looking corner tower; fake-fronted gables, rising like empty pretentious masks high above the real roof, and the whole building, despite its apparently *would-be* Dutch gables, is more or less overloaded with Italian pseudo-Classical details (often of the most vulgarly florid description) such as Ionic and Corinthian pillars, heavy garlands and discs, vases and urns, spikes and balls or stems. One of the rules seems to be: When in doubt add more vases and balls, especially



balls. Another very characteristic and universal detail is a sort of *scroll* used to round off all sorts of angles, and which is something like a half-unrolled periwinkle. The invariable corner tower is adorned by an equally inevitable *bull's-eye window*, and the usually domed (though sometimes flat-sided, with a sort of comb as a finish) ugly lead or slate roof of the tower is generally surmounted by a pointed thing of some kind or a flagstaff. Likewise in balconies, the same lack of originality is apparent, for there is a single kind of *balustrade* that has a big *vase-like bulge in middle*, or a series of little bulges like a flat sausage tied in at intervals with a string, and of which the highest types, together with that of the balls on stems, are to be found in the play-boxes of wooden bricks. Of course, to a purist the very idea of such a *hybrid mixture of Northern outlines with Italian Classic details* is dreadful; but more easy-going people would tolerate it readily enough if the result were pleasing, but I don't think many people who take an interest in looking about them as they go along the streets will allow that it is a happy mixture, though, of course, anything is better than the old monotony of stucco houses like bars of grey soap or square boxes. Surely it would be a good thing for you, who in publishing designs direct our builders' taste, and thus bear a certain responsibility towards the public, to use your influence to discourage this incongruous and ugly mixture of styles.—I am, &c., S. B. CLAYTON BROWNE.

## DOMESTIC DRAINAGE.

Sir,—I have been greatly interested in your "Notes on Domestic Drainage," which I consider excellent. The drains of my house, as laid by the architect, were so bad that I had to entirely relay those of the sewage part, and I only wish your notes had come out sooner, so that I might have benefited by them. I use the smoke-rockets, and find them excellent, but quite agree with you that a machine which acts with force must be far better, and I shall be glad to know where I can be supplied with the best and easiest of manipulation. I have Boyle's exhaust ventilators on all air-shafts, and find they work well; but they might be better made, as the knobs come off, and in one of them I now have a blue-tit's nest, with young. I have tube closets, which I think you agree are the best; but they have no air-tubes to overflow-pipe. Is this an actual necessity? I also have a lead tray under each closet, but no outlet-pipe from it. You seem to me to be fearfully down on architects, and certainly from my small experience I cannot defend them. My drainage was a disgrace, and I have had to replace the whole of my hot-water system, or nearly so. What suits one part of the country won't suit another, and yet these architects seem to have a set of rules and think they are perfect. They never bother to ask about the water as to its hardness, and if they are from a town which possesses soft water they put in pipes, &c., same as they are used to in their own town, rather than ask a local plumber about the matter. In my case I had my lead pipes furred up in no time, and might have had a serious accident. Architects won't, as a rule, be guided, and therefore the local plumber has to do what he is told, even when he knows from experience that it is entirely wrong, and I believe it was so in my case. As to chimneys, they only think of the outside appearance, and will waste any amount of heat by building them on outside walls, just for appearance, and they will build them at different heights for the same reason, and never think of the consequences. We all know what it means to have smoky chimneys; if not, I say, Marry, and go into a house with such, and you will soon learn. If a woman has the temper of a goddess, she is bound to be past living with, if such things are not *en regle*. All these things can be prevented if the architect is worth his salt. From my experience and your notes, I am afraid that the architect of the present day is sadly behind his work, and it is high time we had properly qualified men to deal with, for the R.I.B.A. does not seem to provide such, or, at any rate, only a small percentage.—I am, &c.,

JAMES COOPER.

Killerby Hall, Scarborough.

P.S.—You may use this as you think fit; but I am one of the employers of the architect, and my experience is bad. It has cost me a lot of money to put things right, and I could say a lot more on the subject.

## Intercommunication.

## QUESTIONS.

[11511].—**Tile Roof.**—A roof laid with good tiles, each tile bedded in hair-mortar and "pin-pointed" on the inside, takes wet. Bond is 3 $\frac{1}{2}$ in., pitch of roof 33°, and 45° in different parts. Is the bedding cause of defect, and what is the remedy? Would a solution of some kind assist before the winter?—ENQUIRER.

[11512].—**Heating Drying-Rooms for Bricks.**—I shall be glad of information as to the best method of heating large drying-rooms of brickworks (glazed bricks, sinks, &c.), two stories high? The upper floors are joists and boards, on which the finished floors will be formed.—B. W.

[11513].—**Lightning Conductors.**—Perhaps some of your readers would kindly give me the benefit of their advice in the following case? A lightning conductor is attached to a church spire, about 130ft. high, by copper clips driven into the joints of the masonry, and some doubts have recently been felt as to the safety of such a way of securing the rod. I should be glad if some contributor would tell me (1) Would not the lightning be directed into the masonry by such a method of securing? (2) What is the best and most recent method of securing lightning rods?—C. S.

[11514].—**Cement.**—I have a large water tank built of Portland cement concrete, faced with Portland cement and sand. I wish now to use this tank to store diluted hydrochloric acid, the strength of which will be 4° Twaddell. What cement can I get to face the tank with which will stand the action of the acid?—J. M. R.

[11515].—**Flooring Boards.**—All writers (e.g., Stevenson's "Wood") say that these should be "cut on the quarter," so that the lines of the annular rings of growth should be approximately at right angles with the plane of the surface of the boards. Is there any foreign prepared deal flooring usually in the markets in which this point is attended to? All that I have seen is cut haphazard, so that a few boards may be so, but the greatest number with the rings running across the section very obliquely, which is bad for shrinkage as well as wear, as in these cases the top surface, under the use of the scrubbing-brush, develops shelliness and long splinters. To use a colloquial phrase, "the scrubbers scrub the guts out of the wood"—that is, the soft part of each layer, leaving the hard portions very offensively protruding. Can proper quarter-cut flooring be bought seasoned and in stock, whether foreign or English prepared? Or is the only method to get it to select deals with the grain running across the section in the proper direction and cut the boards and season them for one's self?—H. R.

[11516].—**Stone Preservation.**—Some stonework in a London suburb building shows signs of decay. Will any practical correspondent recommend a solution, and how it is applied?—H. H.

[11517].—**Tile-Hung Work.**—I should like some information about this kind of construction, as to the best way of fixing the tiles, the proper lap, and finish below? The ordinary specifications and textbooks do not give any practical information.—DAMP-PROOF.

[11518].—**Fixing Stonework.**—Which is the best way to fix a stone cross on a pedestal or gable? A practical mason's reply will oblige.—ENGINEER.

## REPLIES.

[11509].—**Architect's Charge.**—"A. D." does not say whether plans include elevations and sections, nor whether the plans are the same for all the eight houses. If the "plans" mean a complete drawing, except details, the usual 5 per cent. would not be too much.—G. H. G.

## CHIPS.

In our description last week of the new bank at Leeds, for Messrs. William Brown and Co., we omitted to state that Messrs. R. Waygood and Co. are erecting the suspended passenger lift in this building. It will travel a height of nearly 70ft., and will be constructed to raise a load of 7 $\frac{1}{2}$ wt., and will also be fitted with a handsomely-decorated passenger cage.

Steps are soon to be taken towards the enlargement and restoration of the parish church at Molesey. The committee appointed for selecting plans have decided to abandon all idea of destroying the old south wall, now covered with ivy, and to confine all alterations to the east end. It is proposed to enlarge the church by extending it further east, and by throwing into it a space between the choir and the organ, which is now unoccupied and wasted. A large transept on the south side will balance the organ-chamber on the north, giving an increase of eighty in the sitting accommodation of the church. A parish meeting has been called for Thursday next, for the final decision, and it is expected that the work will be fully carried out during the summer and autumn. The maximum estimate of the cost is £2,500.

The new drill-hall, St. Alban's, has been commenced. The building will cover an area of 100ft. by 90ft. The main structure will consist of red bricks. The building will be covered with a double-span roof of corrugated iron lined with boarding, upon iron principals. The front elevation will be constructed in red bricks with buff panels, six windows placed at intervals, and two sets of double doors, surrounded by moulded brick pilasters and cornices. The contract for building has been intrusted to Messrs. C. Miskin and Sons, of St. Alban's.

## Legal.

## OLD DRAINS OR SEWERS.

IN addition to the difficulty of distinguishing between a drain and a sewer, a new objection was raised in a recent case by the Vestry of Bethnal Green (*Times*, June 3), which might often have proved very awkward to the owners of old property had it been upheld by the Court. The owner of certain premises had applied for a mandamus against the vestry to compel them to repair a drain or sewer which was made in 1866, and receives the drainage or sewage of several adjoining houses. It seems to have been admitted that this drain amounted to a sewer or branch sewer within the Act, and according to the case of "*Kershaw v. Taylor*" (1895, 2, Q. B. 471); but the defendants now raised a new point, which they said had been overlooked in that case. It was, that the previous approval of the construction of this sewer had not been obtained from the Metropolitan Board of Works, as was required by section 69 of the Metropolis Management Act, 1855, and some amending Acts. The plaintiff did not seem to have been able to prove the obtaining of such consent, and it was urged on his behalf that it was not necessary, or if it were, then it should be presumed.

The Divisional Court suggested that, after the lapse of so long a time as 30 years, such consent ought, perhaps, to be presumed in the absence of clear disproof. But, on the other hand, they said as the mere fact that the requisite consent was not obtained for the making of the sewer does not render it any the less a sewer when it was made, how could such consent be necessary? Besides this ruling, it appeared that, from the evidence filed in the case, it ought to be inferred that the vestry knew and approved of the making of the branch sewer at the time of its construction, and of its connection with their principal sewer in the adjoining street, so that they could not now be allowed to raise their objection. Finally the Court held that as the sewer must have been made with the knowledge of the vestry, and without disapproval by them, and as there was nothing to show it was not made by their orders, it was one they must repair, and so the rule for a mandamus as asked was made absolute with costs. Had the Court decided otherwise, there would have been a new and very serious difficulty raised in regard to old drains or sewers, and the liability for their repair, which fortunately have been so far avoided.

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NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by Tuesday morning to insure answer same week.

A. B.—**BUILDING.—AGREEMENT.**—I cannot suggest any form for use. There are books, such as Emden's "Building Agreements," and the like, which might help you; or you can consult your solicitor.

## LEGAL INTELLIGENCE.

LEIGH DISTRICT COUNCIL AND THEIR BY-LAWS.—At the Leigh Police-court on Monday, Dr. Jones, of the Avenue-gate, Leigh, was charged by the Leigh District Council (1) with erecting buildings and not leaving the street at a width of 12ft.; (2) erecting buildings before expiration of notice; and (3) making a new street of less width than 12ft. Mr. J. K. Bradbury, who appeared for the Council, said Dr. Jones had erected a house in the Avenue, Leigh, the side of which abutted on a street called Back Henrietta-street. Alongside the house there was a passage left 12ft. wide, but alongside his garden the same passage was made, in contravention of the by-laws, only 6ft. wide instead of 12ft. That made it impossible for carts to go along the passage to the ash pits. What the Council sought to do was to make Dr. Jones set back his garden fence and his outhouse so as to make the street 12ft. wide. Dr. Jones had also contravened the by-laws by commencing to build before the fourteen days' notice required by the by-laws had expired. Mr. Sutton, for the defence, contended that the passage in question was not a street within the meaning of the Act, and it was not a thoroughfare, but a *cul de sac*, containing two obstructions. It had never been dedicated to the public, and there was no right of way for the public at all. The Council wished Dr. Jones to make a street 12ft. wide, not for his own benefit, but for the benefit of others. The passage was only a way to the back of the defendant's premises, and was not a street. He therefore contended that the Council had no jurisdiction in the



matter. The Bench, after inspecting the passage, said that the case raised a most important question as to the construction of the Council's by-laws. They considered that those by-laws did not support the contention of the Council in regard to these cases, and the charges would therefore all be dismissed with costs. Mr. Bradbury was granted leave to state a case before the High Court of Justice, Queen's Bench Division.

**A SNODLAND BUILDER'S FAILURE.**—RE THOMAS PHILIP TOMLIN, BUILDER, SNODLAND.—Debtor was questioned at an inquiry last week on an account of his transactions with a Mr. Payne, furnished by order of the Court. This account, he said, had been prepared from figures on scraps of paper, not from entries in any book. The total of £550 10s. 1d. paid to Mr. Payne to the end of September, 1893, was the price of material for four cottages, and land for the same. He never had any deed relating to the ground. Questioned as to Mr. Payne's mortgages for £650, debtor said £400 was first advanced to him, and the amount grew up to £650. Mr. Payne was his financier. He did not understand the way in which the business was done, nor did he know whether the papers he signed were deeds or not. Eventually the examination was further adjourned, the Official Receiver intimating that there must be a private examination of Mr. Payne, in order that debtor's transactions with that gentleman might be cleared up.

**A DISPUTE AS TO PLANS.**—Richard Jones, retired builder, sued the Walsall Coffee-House Company, Limited, for the sum of £8 5s. 6d. for the preparation of plans at Walsall County Court last week. The contention on the part of the plaintiff was that the defendants wanted him to do work without payment, whilst the defendants' view of the matter was that the plaintiff refused to modify plans which he had prepared for them, and for which they were quite willing to pay if modified. The evidence showed that the plans in question were for the alteration of premises in High-street, afterwards converted into the Victoria Temperance Hotel. They were passed by the local authority, and a tender was obtained at the price of £400. Then the defendants desired different arrangements of the premises, and the dispute arose on the point whether the plaintiff should or should not be paid for making plans to carry out the alterations. He declined to make a second set of plans unless paid for the first, and as the defendants would not pay for those already made as they stood, the case came into court. His Honour found for the plaintiff for £8 and costs, including a fee to the plaintiff for attending.

**LORD SALISBURY'S CRANBOURNE-STREET PROPERTY.**—THE STRAND BOARD OF WORKS V. KIRK.—Mr. Buckley, Q.C., appeared on Friday last before Mr. Justice Stirling, sitting in the Chancery Division, in support of a motion by which the Strand Board of Works asked for a mandatory injunction against the defendant, Kirk, for the abatement of a nuisance upon land nearly adjacent to Daly's Theatre. It appeared from counsel's statement that the Marquis of Salisbury, as owner of certain land in the neighbourhood of Cranbourne-street, Leicester-square, in 1874 granted a license to defendant to enter upon the land in question for building purposes, and, in accordance with the license, Kirk had made certain excavations, but had been unable to complete the works that had been begun, and rain and surface water had got into the trench excavated, where it stagnated and, by its proximity to the sewer, had become a serious nuisance. Counsel said that this condition of neglect had lasted so long that the timbers that had been used in the excavation had become rotten, a crack had opened in the sewer, and a nuisance had been caused that was a danger to the health of the residents in the neighbourhood. Lord Salisbury was unwilling that this state of things should continue, and proceedings had been commenced against the defendant to recover the possession of the whole of the land. The proper remedy was to fill in the excavation with concrete, and so raise the water by degrees. Mr. Kent, on the part of the defendant, said that he could not consent to the landlord coming in and taking possession of the whole of the land. His client had already spent over £20,000 upon it, and it was a serious matter for him to be ejected. Mr. Justice Stirling said that really what Mr. Buckley had asked for was a mandatory injunction, and as the application was practically one made *ex parte*, he could not grant that, as Mr. Kirk ought to have time allowed him to answer affidavits. He should direct that the motion should stand over till next motion day, that the Attorney-General's fiat might be obtained in some other proceedings that had been commenced against Mr. Kirk.

**PLACES OF WORSHIP AND PUBLIC ROADS.**—Mr. Denman had before him on Tuesday an adjourned summons by the Lambeth Vestry against the trustees of the Baptist Chapel, Arodeno-road, Brixton Hill, to recover the sum of £116 as their contribution towards the cost of making up that thoroughfare. The summons was taken out under the 105th section of the Metropolitan Local Management Act, 1855.

On behalf of the defendants it was contended that the exemption contained in section 162 in favour of places of worship extended to sums which the vestry proposed to raise under section 105. Mr. Denman, who had reserved his judgment, now said he had come to the conclusion that the decision in "Wright v. Ingle" was a distinct authority that such buildings were rateable in the sense of being assessable, under section 105. He should, therefore, make an order for the payment of the amount, with £2 5s. costs.

**THE LONDON COUNTY COUNCIL AND SKY SIGNS.**—THE LONDON COUNTY COUNCIL V. THE SAVOY HOTEL.—This was a special case stated by Mr. Vaughan, a Metropolitan Police Magistrate, raising the question whether the sign on the roof of the Savoy Hotel was a sky-sign within the meaning of the London Building Act of 1894. Mr. Horace Avory, who appeared for the London County Council, said in July last year the proprietors of the Savoy Hotel were summoned for having unlawfully retained a sky-sign without the license of the County Council, contrary to section 128 of the London Building Act, 1894. The sign in question consisted of a series of boards, to which were attached embossed letters in metal frames. The boards, which were fixed by means of iron rods, were 118ft. in length, and 7ft. to 8ft. in height, and the letters forming the words were 5ft. in height. The learned magistrate found that the boards were visible against the sky from the Embankment and other places, but that no portion of the letters forming the words, "Savoy Hotel and Restaurant," was visible against the sky, but only against the boards, and held that the letters were not a sky-sign within the meaning of the statute. The Act of 1894 said the term sky-sign should apply to any sign wholly or in part upon, over, or above any building, and he submitted that what was complained of in this case was a sky-sign within the meaning of that statute. Mr. Dickens contended that the sign in question was not upon, over, or above any building or structure, and therefore did not come within the meaning of the statute. Mr. Justice Cave: Where do you say it is—below the building? Mr. Dickens: No, against it, and therefore it is not a sky-sign. Mr. Justice Cave said he was clearly of opinion that what was complained of was a sky-sign, and therefore the magistrate had come to a wrong conclusion as to the meaning of the interpretation clause. The case would go back to the magistrate, with an expression of opinion that he ought to have convicted. Mr. Justice Wills concurred, and the appeal was allowed, with costs.

## CHIPS.

In consequence of the expansion of business in Ireland, the Yost Typewriter Co., Limited, have recently opened an additional branch at 30, Bachelors-walk, Dublin. A complete assortment of typewriters and supplies, together with a competent staff of operators, will always be on hand.

The members of the Archaeological Section of the Midland Institute propose to take an all-day excursion on Wednesday, the 24th inst., to Winchcombe and Sudeley Castle. The party will travel by train to Cheltenham, and will drive thence to Postlip, Winchcombe, and Stanley Pontlarge, returning by way of Bishops Cleeve. Mr. J. A. Cossins will act as conductor of the party.

Mr. Forsyth's recumbent effigy of the late Bishop of Norwich is now rapidly approaching completion, and will be unveiled in the cathedral on the 1st of July, the 800th anniversary of the foundation of the cathedral. The effigy is in statuary marble, and the portrait has been pronounced most successful.

The Civil and Mechanical Engineers' Society, on Thursday, June 18th, visited the new structure now being erected at Kennet Wharf, Upper Thames-street, E.C., for the Union Wharves Co. The work has been designed and is being carried out by Mr. H. Coward, C.E., the consulting engineer being Mr. E. H. G. Brewster, A.M.I.C.E., M.I.M.E. Having inspected these works, the party proceeded by river to the Barking Sewage Works of the London County Council, where they were received by Mr. Stokoe, the superintendent of the works. These works were completed in 1889. The quantity of sewage treated in 1893 was 67,583,000 gallons.

A few weeks ago it was mentioned that a committee of the Edinburgh City Parish Council was considering the desirableness of erecting a new asylum for the housing of pauper lunatics. The conferences that have taken place on the subject have been with the managers of the Royal Edinburgh Asylum; and an agreement has now been virtually come to under which the city parish council, supported by the managers of the Royal Edinburgh Asylum, will apply to the General Board of Lunacy to have the city parish constituted a separate lunacy district, and to authorise them to erect a district asylum for the accommodation of at least 400 pauper lunatics.

## Our Office Table.

In addition to the widening of the Strand and several other street improvements which will shortly be considered by the London County Council, the Improvements Committee of that body have now prepared a scheme for the extension of the Chelsea Embankment westward from Battersea-bridge to Lot's-road, Chelsea. To carry out the improvement about three and three-quarter acres of mud banks will be reclaimed from the river, a granite embankment wall will be built, and a road formed. It is also proposed that between the embankment wall and Cheyne-walk tidal baths should be constructed by the vestry, or that some of the land should be laid out as gardens. The estimate of the net cost of the improvement amounts to £64,000, and the vestry has agreed to contribute one-fourth. It is suggested that the improvement should be carried out on the "betterment" principle. Another scheme for the improvement of Long-lane and Tabard-street, Southwark, has been drawn up. It is suggested that powers should be sought to widen Long-lane between Southall-place and Borough High-street to a uniform width of 50ft., to improve the approaches to Tabard-street from Borough High-street by the formation of a road through a part of St. George's churchyard, an equivalent amount of land to the east of the new road being given up and kept as an open space. The estimate of an engineer for the necessary works connected with the improvement, including the construction of a subway, is £20,000, and the estimate of the valuer for the acquisition of the property, including that proposed to be kept as an open space, is, after deducting recoupment, £170,400, the total net cost of the improvement being, therefore, estimated at £190,400. It is also suggested that Holloway-road should be widened at a cost of £8,550.

MR. RIENZI WALTON, M.Inst.C.E., and Mr. Theodore Thomson, M.D., on Tuesday, at the Liverpool Town Hall, held a Local Government Board inquiry into the reasons for the application by the corporation for sanction to borrow £13,000 for the erection of dwellings for persons of the labouring classes. The Insanitary Property Committee, the Liverpool House Owners' Association (which opposed the application), and various other interested persons attended. The deputy town clerk (Mr. Pickmere) said that the money was required for a scheme the corporation had in contemplation for providing cheap-rented workmen's dwellings on land between Gildart's-gardens and Ford-street, in lieu of others which have been found to be insanitary. The present idea of the corporation was to erect houses of two stories, each containing two two-roomed tenements, which they intended to let at about 2s. 6d. per week per tenement, with a few of a better class at rents running to 4s. per week. The designs from which it was proposed to erect these cottages showed an area ten per cent. larger, with superior sanitary provision in every way. Evidence regarding the details of the new buildings proposed to be erected was given by the deputy surveyor (Mr. Turton), the city engineer (Mr. Boulnois), and the medical officer of health (Dr. Hope).

At last week's meeting of the Southampton Town Council, the town clerk read a report to the works committee on the systems adopted in other towns in respect to the work which in Southampton was performed by the quantity surveyor. He had made inquiries from 55 county boroughs, and found that of this number 20 boroughs take out all quantities with their own staff; in 17 boroughs outside surveyors were employed at the usual professional charges; 13 boroughs take out quantities with their own staff in small matters only, and in the remaining five boroughs a special staff was employed for the purpose. In his (the town clerk's) opinion it was worth the council's while to consider the advisability of employing an additional assistant in the borough surveyor's department whose special duties would be to take out quantities in small contracts, and when not so engaged to be employed in the ordinary work of the office. The committee resolved to recommend the council to appoint a competent person in the borough surveyor's department to take out quantities and measure up works for all departments of the corporation, at a commencing salary of £100 per annum. Mr. Lemon moved, and Alderman Bone seconded, the adoption of the report, which was carried.



## THE BUILDING NEWS

AND ENGINEERING JOURNAL.

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## WHAT THE PUBLIC EXPECT.

"I COME first; my name is Jowett. Whatever can be known, I know it." Such was the extravagant pretension which some waggish undergraduate attributed to the late Master of Balliol. The modern architect may justly adopt it, with a difference. "Whatever can be known I am expected to know it," would be a fitting motto for all his tribe. His own will has in it a more modest working. He would be content, as his greatest predecessors were, to be simply a head builder. To have produced a Parthenon, or even a Pantheon, is achievement enough for a man of the highest ability—much more to have created a steeple like that of Freiburg, or an interior like that of Chartres. But the masters who did these things, could they come back to-day, would get more kicks than halfpence from a discerning public. Their ignorance would be exposed at every turn, for they knew but one craft and knew it well, while the way to succeed now is to aim at knowing five hundred, and, in consequence, to know all of them but badly.

The complexity of modern life has, of itself, made the architects' duties incomparably more difficult than they used to be. In Mediæval times it was almost enough, in the matter of planning, if he understood how to arrange a church, a castle, and a manor-house. Now, unless he is lucky enough to be a specialist with a high reputation, he may be designing a board-school to-day, a music-hall to-morrow, a set of farm buildings next month, and a large hotel before the end of the year. Then he may be invited to restore a village church, to submit plans for baths and washhouses, to lay out the roads and drains for an estate, and to remodel and decorate the inside of a town mansion, to turn a lot of unlettable offices into residential flats, and to compete for a new museum, a council-chamber, and a set of law-courts. There is enough here to puzzle an Admirable Crichton; but this is only the beginning of troubles. One can just conceive of a human intelligence so all-embracing and so versatile, that it could realise and provide for all the different arrangements wanted in these and a variety of other structures. An almost unimaginable genius, with plenty of elbow-room and with perfect freedom to take its own course, might, perhaps, accomplish it. But perfect freedom is what the modern architect never gets. Incessant interference, rather, is the law under which he works. We repeated last week Mr. Waterhouse's history of the amazing, the almost incredibly fatuous "instruction" which was imposed on the late Mr. Street at the Law Courts. The intention of his central hall was to supply a great space into which all the courts should open, so great that it could never be crowded, and so direct in its communication with them that counsel and persons concerned could instantly pass from one court to another. Well, the gentlemen whose duty it was to supervise the architect, actually insisted that the floor of this central hall should be at least one story below the floor of the various courts! The hall, therefore, became useless. The courts open into crowded passages, and to find the way from one court to another is a very serious problem with everybody whose business does not take him there pretty frequently. The authors of this notorious bungle "lay low" and said nothing. All the world blamed Mr. Street—dead, and unable to defend himself—and only now, for the first time, do we know who they really were

that brought upon London the great Strand failure. This is but a gigantic specimen of what goes on almost everywhere and every day. The architect's own judgment is overruled. He is told to do this, and that, and the other, and then when, as he foresaw, it turns out badly, the person who overruled him cries out to his friends, "See what a mess my architect has made!"

Suppose, however, there is no such private interference. There will still be public interference, and often a great deal of it. As towns get larger, and population gets thicker, we are all more and more in each other's way. There is a general want of elbow-room; an increasing set of laws and ordinances and by-laws to prevent us from doing a thousand things which were once lawful and harmless, but which are now liable to cause loss or injury to other people. We must be careful not to rob our neighbours of light or air, or to weaken their foundations, or to deprive them of lateral support. We must build with walls of a certain thickness, and must not go beyond a certain height, and in particular cases must put in floors and staircases of the kind which, in grim irony, are called "fireproof." We must have the local rules about parapets, and party-walls, and piers, and openings, and windows, and fireplaces at our fingers' ends. We must know how to serve notices to build and notices of objections. We must be prepared to deal with dangerous structures, and must remember what may and may not be done as to dwelling-houses on low-lying lands. We must keep a constant eye on our county councils, so as to obey their various by-laws as fast as they make and alter them. We must do this, not in one city, or borough, or county alone, but in every town or village of the kingdom where business takes us, remembering that each has its local fads, and that while one town hardly guards against anything but death by fire, another seems to fear nothing but collapse of buildings, and a third only dreads the effects of sewer gas. Really, to be perfect in these things, we ought to pass our mornings in the perusal of Health Acts, Building Acts, Metropolis Management Acts, and Management Amendment Acts. Our afternoons might be devoted to Factory Acts, Paving Acts, and Local Regulations, while reported law cases affecting architects would supply a little light reading before going to bed. If in the night we sleepless lie—a not unlikely result of days so spent—we could pass away the time by looking up decisions on questions of dilapidation, and by trying if we cannot devise some "conditions of contract" which will please architects and builders alike.

This, however—which would be considered a tolerable amount of legal knowledge even for a barrister—is merely one of the incidental accomplishments which the architect is expected to possess. It has nothing to do with the real essence of his studies. These consist in understanding masonry better than a mason, carpentry better than a carpenter, bricklaying better than a bricklayer, plastering better than a plasterer, and so on through the whole round of trades which are needed to construct and fit up a modern building of the first class. Even this by itself is a somewhat "large order." The man must have a very hopeful disposition who fancies he will effect it before he dies. But, utterly impossible as it is to do, the architect soon finds that he is called upon to pose as having done it. The public think him incompetent if he cannot, or will not, correct every workman at every turn. By study and thought and observation he does, sooner or later, find it possible to teach them something, and, unless he is absolutely stupid and unreceptive, he learns more than a little from them in return. If they or their masters were thoroughly honest, and if, as was the case in olden times, they had had the thorough training of hand and eye which every artificer ought to possess, they, with

the architect as general manager and director, might turn out very good work between them. He would have settled in his own mind the result to be obtained, and they, by their intimate knowledge of details, would help him to obtain it in the readiest and most efficient way. But the trained artificer died out generations ago. No workman now, speaking broadly, can effect anything by himself. The architect has to show everybody, as well as he can, how to do everything—from the greatest down to the very smallest; and seeing he is only a man, and not an archangel, it is inevitable that he should not always show them what is ideally the best. Yet he is perpetually being called on to direct fresh trades, any one of which needs years of individual attention to learn it properly. No mortal can keep pace with the new inventions and new materials even in the old trades. Is he to use Wiggins's cement? It is cheap; but will it stand damp and frost, or will it blow, or crumble, and go to pieces? Is it better than Thomson's cement, or Williamson's plaster, or Richardson's hydraulic lime? What is he to say about the new Crocodile kitchener (one of the hundreds he never heard of) when his client's wife asks his advice? How is he to tell whether it is properly set, and what is he to do if it turns out a failure? "I am afraid," the lady remarks to her husband, "that your architect is very unpractical. He hardly knew the names of several stoves and ranges which I mentioned to him." Of course, he ought to have examined and tried them all, as they successively came out, and want of time is no excuse for him. So it is with new inventions and introductions in every trade. The new trades themselves are about as much as he can grasp, and he has hardly come to a final decision, even yet, on the great electric wiring question. He dreams of insulating tubes and conducting tubes; he is haunted by volts and megohms; he is in a nightmare of "earths" and short circuits, and fusions and surface leakages.

All this knowledge, however, even if the architect could acquire it, would of itself avail him nothing. His business is not to know, but to do, and he only begins to be of use when he exercises quite another set of faculties, about which we have yet said nothing. His work in the world is to plan, to arrange, to design, to invent, to harmonise. If he is to do this properly, all his weight of learning must sit on him lightly, like a flower. To some men, design comes quickly and easily. To others, it means long labour and repeated correction. Thirty years ago there were two church architects here of the highest rank. One sketched out his schemes as if by magic. They turned out well, and he did much. The other revised and re-revised, wore through his paper with erasures, pasted more paper behind it, and wore through that as well. He, too, did good things, though few, and his brilliant rival placed them, in sincerity as well as in humility, above his own. Excellent work may be done in both ways, but it is only the rapid designer who will please his clients and prosper. The other one spends more time than they like over his drawings. They do not see him at work, and they think he is neglecting them. The popular idea is, that the architect only needs a ground plan and a water-colour sketch. As a matter of fact, he requires a plan of every floor, an elevation of every front, a series of sections showing at least two sides, and, if possible, four, of every important room, and a detail of every architectural feature in the structure, from the largest to the smallest, with the mouldings outlined full-size. On the average, taking general plans and details together, each will require, at the very least, a day or more, probably two days, to design and draw. In an architectural building, like a church or a mansion, costing £10,000,



from 50 to 100 such drawings and details will probably be wanted. If the architecture is to be worth the name, the architect has no alternative but to make the greater part of them himself. If he is a sham architect, with no aim beyond £ s. d., and no purpose in life except that of producing an unbroken series of profitable "pot-boilers," he will turn them over to his clerks, and grow rich and respected. Such a man a commercial country can appreciate, for he works on commercial principles. He gets a seat on Boards and Councils, and he makes it pay. He is the ideal architect of the prosperous middle class. To him goes nineteen-twentieths of all the work that is going: and it is to him we owe the rampant vulgarity, the flashy, tawdry ornamentation which has come to characterise our London streets. But he understands his countrymen. Experience has taught him that faults in taste never trouble them. If he only takes care of their bodies and their purses they will never reproach him for anything that merely affects their minds. So he arranges his building to suit their convenience: he picks up law enough to keep them out of litigation, and sometimes knows enough of sewers to avoid bad smells. With these accomplishments, and a certain plausibility of speech, in which the genuine architect is apt to be deficient, the charlatan who takes his title goes through life with satisfaction to himself and others.

After drawings comes superintendence. In many people's opinion, it is for this alone that an architect is required. Wanted or not wanted, they like to see him frequently at their building. It gives them a sense of proprietorship in him, and they would prefer him, like Mr. Boffin's secretary, to be "always on hand." His duty, as they conceive it, is that of a perpetual detective. If anybody omits to drive in a tin-tack or to flush up a brick, the architect is to blame. They expected omniscience from him before the building was begun, and, when it is, they expect omnipresence. Even persons who ought to know better sometimes give currency to the same impracticable notions. Junior members of the profession, hardly old enough to learn, but extremely ready to teach, think that it is not enough for an architect to approve or condemn materials as they are delivered on the site. He ought, they say, to give his judgment on each brick at the brickfield, and on each block of stone at the quarry; for if he does not, the builder who wants to evade his contract has the trouble and expense of first carting bad materials to the building, and then of carting them away again after they are condemned. Well, the builder has the remedy in his own hands, and there most of us are quite content to leave it. After "trying it on" once or twice, he finds that the system does not pay, and then matters go on with more credit to himself and more satisfaction to everyone else.

We have only touched on a fraction of what the architect is expected to know and to do. He cannot pick up a knowledge of prices and estimating in a day, or a month, or a year; and yet he is very imperfectly qualified if he tries to dispense with it. He urgently needs it when he is first called in, he needs it no less when the building is done and the deviations have to be measured up. He needs a knowledge of warming and of ventilation—two things which the loudest-tongued specialists, if we judge them by results, understand very imperfectly, but as to which he, quite as much as they, will be blamed if their systems fail; and he requires, too, a knowledge of "sanitation"—a fine word, which chiefly means, in practice, the art of manufacturing poisonous sewer-gas by wholesale, and then of using all the wits you have got to see that there is no chink or cranny by which it can enter your house. But when it comes to watching chinks and crannies, the architect, with a myriad things

to learn, and a thousand worries on his mind at every hour, is hardly the man to employ. For the general scheme of the drainage he is obviously responsible, and so far we agree with Mr. Cooper, our correspondent of last week. But in important cases a clerk of works should see every drain-pipe laid and tested. To obtain properly qualified architects, important as that is, will not by itself prevent such evils as he complains of. The things now expected of an architect in the way of knowing, doing, and detecting are more than he could manage, even if he were, "like Cerberus, three gentlemen at once." The real blame of the profession is that it allows the public to expect from each member of it what it would take at least half a dozen able and hard-working men to accomplish. There are plenty of incompetent persons who go by the name of architect; but the most competent man living, by putting out all his energy, could not learn or accomplish more than a small part of what a thoughtless world is prepared to expect from everyone who takes the title.

#### CORNERS AND CROOKED PLOTS.

ONE of the difficult problems which beset the architect of our large towns is the utilisation of crooked areas and corners. No one who looks at the monstrosities which disfigure the corners of our main thoroughfares in the Metropolis can avoid the reflection that some of our finest sites have been ruthlessly sacrificed to the Baal of utility and commercial expediency without a thought of the evil example, or its pernicious effect on the public mind. It is not necessary to go far for examples. Beginning in the City, who can but regret the erection of large blocks of shops and warehouses on the south side of St. Paul's Cathedral, which, by their height, detract from the cathedral; the awkward corner to Ludgate-hill on the same side? Ludgate-circus and Holborn-circus have both been spoilt by business premises which do not even pretend to have been designed to suit quadrants, or to finish the buildings which meet them on either side. The large and important space round St. Clement Danes might have been made a worthy approach from the west to the Courts of Justice, but the corner sites have been utilised by buildings of the most ordinary character. When the block of old houses between Holywell-street and the Strand is removed, these buildings will be still more disagreeably revealed to view. Then, farther westward, a tinkering and cheeseparing policy has rendered a site worthy of better treatment a reproach to our taste. Large and irregular as it is, the architect had a favourable opportunity for making an impression in Piccadilly-circus, had it not been that he was hampered by crooked plots made by the new entrance of Shaftesbury-avenue and the curved frontage from Coventry-street. Can we be surprised that these conditions entirely destroyed anything approaching successful architecture, and that the buildings erected on them look distorted and unsightly? In scarcely any of the areas or centres made by intersection of new with old streets do we find buildings worthy of the sites. The junction of Shaftesbury-avenue and Oxford-street is distressingly poor as it is. Could not the large triangular area have been surrounded by stately buildings on the eastern side? That made by Charing Cross-road and Oxford-street, facing Tottenham-court-road, is equally bereft of any architectural significance; and Cambridge-circus, at the junction of the above two new thoroughfares, appears to have been left to the speculative builder. The authorities responsible for these alterations have shown themselves strangely indifferent to architectural propriety, by allowing buildings to be put up which evince a lamentable want of appropriate design, to say nothing of

ingenuity in turning these corner plots to the best account. We now look at them with regret that so much has been lost, or a shudder at the unsightly blocks which have been erected. Who can, without a shock to his sense of architectural fitness or taste, look at the jarring block of red brick which disfigures St. George's-circus on the south side of the river, and used as an ophthalmic hospital?

The indictment against our great street corners is that not only are they haphazard—the result of fortuitous circumstances, but that the buildings that are erected on them are harsh and ungainly. When a new or widened thoroughfare is proposed, the promoters and surveyors only seem to think of directness of route, and to pay little regard at all to the junctions or intersections the new route makes with the older streets and junctions. Instead of considering two extreme points, one at either end of the new route, which might be made important centres of traffic, only the line itself is thought of, however many new intersections or embouchures it may make. A little deviation here, or a little curvature there, may bring existing junctions into use, or save a number of acute intersections with existing lines of streets. Then there is such a thing also as "a line of least resistance"—to borrow a term in physics, a desire to avoid heavy cost or compensation in selecting a route—a principle which, perhaps, may explain the difficulty in deciding the proposed line of thoroughfare from the Strand to Holborn. But many good routes may be balked in this way, the "line of least resistance" or cost leading us to select many of the most undesirable lines for our new streets. If the question of compensation be made the only principle of street arrangement or improvement, we may well despair of seeing London improved. Of course, of two routes equally good, preference will generally be given to the one that is the least costly. We are not in the position of some of the great cities of the West—Washington City, for example, able to lay down a complete plan, or select the sites of the great edifices and the lines of avenues, as was done by President Washington and Peter Charles L'Enfant late in the last century, though once in the history of London this was possible, but the opportunity was lost—perhaps happily. Yet we can still adopt some principle in our future opportunities, instead of allowing private or party interests to prevail, if our two great municipal authorities were to agree to lay aside petty animosities, and to share the honour and cost of making the Metropolis worthy of its claim to be the "richest city in the world." We do not now attempt to indicate in what manner London can be improved without destroying its picturesque character; but we may say this object can be attained rather by emphasising and improving the main junctions that already exist than by increasing their number; rather by widening and improving our thoroughfares than by making new ones, except where the development of traffic calls for new routes, as in the contemplated connection between the Strand and Holborn.

We shall not do much to improve the architecture of our streets, if we continue to neglect the corner plots. Let us make these our first consideration. We have referred to Washington—may we not try as far as possible to follow the builders of that city in arranging the sites of our public buildings? Mr. Glenn Brown, in an article in the *Engineering Magazine* on the domestic architecture of that city, describes the manner these corner plots have been in some cases treated, and shows how the varying obtuse and acute-angled plots at the intersection of the avenues afford opportunities for picturesque effects. The corner plots are chiefly right-angled triangles, with one very acute angle at the extreme point. Several types of corners are



seen in all our large cities. These may be generally classified as follows:—(1) Rectangular plots, as those formed at the corner of two right-angled streets; (2) trapezoidal-shaped plots formed at the corner of two streets at an obtuse angle; (3) triangular plots, those between streets meeting at an acute angle; (4) quadrantal shaped; and (5) canted areas. It would be well if architects studied each of these shapes, to see what is possible to be made of it. To take, for instance, the third class, the plots of triangular shape which is very common and is very seldom satisfactorily treated. The ordinary designer simply cuts off the angle by a curve or a straight line, and forms a canted corner. Such a centre as Seven Dials presents us with the result. In hundreds of corners in London we see the canted corner house, often a public-house, but without any pretence to be other than it is—it is barely tolerable at the best, a vulgar commonplace arrangement that saves all thought and expense, generally a hideous alternative to save the acute corner. Sometimes we see an attempt to finish it with a gable or a tower, and should the lines of main fronts subtend an angle of 60°, we may occasionally see the canted corner and the two adjacent sides carried up to form half a hexagonal turret, a clever dodge, no doubt, to stop the roof and to give emphasis to the corner; but stupid and obtrusive if the idea is not carried out well. The circular corner finished as a turret, or with a spirelet, is very often seen in America: it is a favourite finish to a sharp corner in New York, Philadelphia, and other cities. The best types are borrowed from France and other Continental cities; but even this sort of termination may become commonplace and wearisome. Examples of what to avoid are to be seen in London. At the corner of Moorgate-street and London-wall is an example or two of the fussy sort of angle turret that is better avoided, and at the corners of other city streets in Cheapside, Poultry, Cannon-street, Cornhill, and Old Broad-street may be seen a few attempts, though generally unsuccessful, to make corner features. Oxford-street offers two or three experiments. The mistake is generally in the attempt to make the turret high, and to embellish it too much, instead of being satisfied with a reasonable and simple treatment. The plain conical spirelet, when not too attenuated or sharp, is more architectural, and infinitely more pleasing than an elaborate turret in which gables, pierced openings, and a lot of carving and cast iron work are introduced. One of the best examples in London of an acute angle finish is Mr. Waterhouse's corner of the National Liberal Club at the end of Northumberland-avenue, where the polygonal form of tower is adopted. There is less difficulty in treating a square angle. It can be rounded off simply, or the angle made semi-octagonal, carried up as an octagon tower, and crowned by a cupola; and probably the best way of joining the two sides of an obtuse plot is to unite them by a curve or succession of cants, and to emphasise the latter by breaks or projections. In the selected design for the West Riding County Council Offices, Messrs. Gibson and Russell have effectively made a square projection at the corner, placed anglewise, and which is crowned by an octagon cupola. But it is the acute corner that is the trouble, like the sharp corners made at the intersection of Cannon-street and Queen Victoria-street, and, as far as we know, the problem is one that is generally shelved. A very good finish to a square building is obtained by a quadrant. Mr. Mountford in his design for the Royal Insurance Buildings, Liverpool, has used this with some effect. Instead of a plain canted corner, a square projecting bay, or a recess internally placed at an angle, as we have referred to in the County Council offices in Yorkshire, affords

facilities for external treatment, as it may be gabled at the top, or crowned by a square tower, as was proposed in Mr. Tulloch's design for the Halifax Bank.

The utilisation of the corner plot is also a point for our town authorities. In some Continental and American cities these areas at the intersections of the avenues and streets are left for small circular, square, and triangular parks, which give breathing space, and enable the buildings to be better seen. In our large towns they might be usefully set apart as the sites of great edifices, thereby obtaining for them the surrounding space necessary for ingress and egress, light and air; but in London these plots are usually the first snapped up for commercial buildings, especially public-houses. Nothing is done to give variety to the frontages by breaking them into bay windows, porches, or oriels, though in this manner many of the domestic buildings in Washington City are arranged. Perhaps the main parlour or library at the sharp corner between two streets is terminated by a circular bay, which extends beyond the lines of frontage on each side, while it cuts off the acute point, and this bay forms a circular tower with conical spire, as in the Simpson Building. In other houses the staircase is made to project like a bay, and is lighted from the side street, or a large dining-room window is seen, which forms a bold break in the elevation. The corner is certainly the weakest point of our street architecture, and seems to be reserved for buildings with long frontages, and for builders who have no idea beyond a canted corner, or for contractors' rubbish yards, or advertisement hoardings. The intersections of our streets admit of a great variety of architectural design, if only the owners and lessors of property could be induced to take a little more interest in their utilisation.

#### REMUNERATION FOR PRELIMINARY DESIGNS.

NEARLY all the disputes and disagreements that arise between professional men and their employers are in some way or another owing to a want of a proper understanding. We are constantly hearing of architects bringing actions to recover for work executed from their designs. The client disputes his liability: he alleges that he did not agree to pay for a building over and above a given cost, while the architect affirms that the designs were approved of; that certain accommodation was asked for; that the client saw the plans and approved of them, without making any distinct proviso that a certain sum was to be exceeded. Which party is to be credited? Generally, it happens that, although something was said about cost at the onset, no distinct or written agreement was made; the architect received his instructions, proceeded with his plans, which were generally approved by the client, and the work was proceeded with under a contract, and not till the final payments are certified is any objection raised by the client; or the work is abandoned after the tenders come in, the lowest of which exceeds the sum first stated. Sometimes the employer refuses to pay; he denies his obligation to pay the architect's commission on the plans and specifications which have been prepared to suit his own requirements and instructions. In all these cases the architect has acted upon the assumption most commonly made, that his client does not mean exactly what he says about cost; that he only desires to keep within reasonable limits, although he wants a building of certain accommodation and character. Nothing has been put on paper, and the architect believes he has an implied, if not an express, authority to proceed with the work. Indeed it would be impossible to transact business of any kind if such an impli-

cation was not assumed. An architect proceeds to prepare designs that he believes will meet the wishes of his employer; it is absolutely impossible for him to keep within a certain limit, or to be able to say what the cost will be till the quantities are taken off and tenders are received. Up to this point the architect, at any rate, is justified in his labour, and has a legal and moral claim to be paid for his plans if the client abandons his intention to proceed. The plans and designs have been of some use, at least, in arriving at a decision. It is said very often that the architect has no right to incur his client in expense if he thinks the building will cost more than the amount stated; but if such a course was generally followed, all design for buildings would be at an end. There would be nothing to lift the art above the most mercenary business transaction, in which the architect would be paid only for the building he carried into execution. Others say the design on paper is of no use to the client unless it is carried out, and therefore the architect, up to this stage, should not charge for his labour—an assertion which practically means that the architect has no right to claim for his thought and skill. The Courts have not endorsed such a view, and have in some cases held that such labour was of use to the employer; but still the law is not very pronounced, and the architect may occasionally find that the judges take a very one-sided view of the matter. One textbook makes the architect's remuneration to depend on contract, or subject to the plans being previously approved by the employer; but as a matter of fact no architect would be so foolish as to proceed with plans that were not approved either expressly or impliedly. The case of "Moffat v. Dickson" does not apply to the ordinary employment of the architect. In that case, it will be remembered, the architect made plans subject to approval of the employers; but the general appointment made is not on such conditions. The retainer is either verbal or implied from the acts of the parties. No formal or written approval is usually given, though the acts of the parties or the circumstances of the case imply such approval. And it is this sort of implied contract with which the profession have mostly to deal, and because it is of this character it is, therefore, uncertain, and special agreements may sometimes be found of service. An authority on the law advises that "all agreements should clearly set out the terms upon which probationary drawings, &c., are to be provided; and if it is intended that the architect should make a charge for preliminary work under any circumstances, or in any event for work actually done, a special clause should be inserted to that effect." No doubt good advice and well intended. At the same time, if we admit the necessity for such a special agreement, we must also admit that nine-tenths of the claims made by architects are illegal. For instance, to take the case we have already referred to of an architect's plans being rejected on the ground that the work cannot be done for the amount of his estimate, such an objection would seriously weigh with the jury, who would have to consider whether there was an express or implied condition that his estimate should be reasonably near the real cost. A case came before the Walsall County Court which illustrates another cause of disagreement. Here the defendants refused to pay for plans prepared because the plaintiff would not modify them to bring them up to their requirements. Plaintiff's plans for alterations of certain premises were passed by the local authority and a tender obtained. The defendants then wanted a different arrangement, but appear to have disagreed as to whether plaintiff should be paid for them. He declined to make a second set unless paid for the first, and the judge found for the plaintiff, as indeed was only fair and just. The question in this instance is im-



portant. It is whether the architect can make a claim for any alterations required to his first set of plans. Many employers have an idea that the architect has to prepare and alter plans till they suit, no matter what the trouble and labour may be. They think they pay only for the result for the design ultimately adopted. According to this view an architect may be compelled to make two or three sets of designs simply to suit the whims of his employers. It is needless to point out the injustice of such a demand: each design costs hours at least of thought and labour, and it is of no advantage to the architect to prepare alternative sets unless he is remunerated for them. If the architect makes a stipulation that he will only charge for the design which is carried out, that is another matter altogether.

#### FACTORY CONSTRUCTION AND FACTORY ACTS.—IV.

By GEORGE H. BINBY, F.R.I.B.A.

##### PLANNING.

IN the case of very large factories destroyed by fire, the utter misery engendered by the complete destruction of the buildings and machinery, upon which many hundreds of persons must depend for their daily bread, is one of the more serious circumstances connected with labour questions. Strikes and lock-outs may be more or less expected, and are usually provided for accordingly; but, as recent events have shown, badly constructed and non-fire-resisting factories not only entail upon their owners the disadvantages of high rates of premiums for fire insurance (or, possibly, the refusal of all insurance companies to take such risks at any price), but also that loss to the community occasioned by destruction of the means of existence of large numbers of persons—a loss that must continue until the factory architect and his clients have been enabled to design and carry into effect building operations requiring, in some cases, very many months, or perhaps years, for their completion.

In some of the manufacturing districts, and, for instance, particularly in Lancashire and Yorkshire, one or more large factories may be found in isolated country districts, and forming, with the numerous cottages for the "hands," the villas for the overseers and managers, and the mansion for the proprietor of the whole, compact villages, upon which it may be observed that the destruction of such a factory would mean loss in every direction, empty cottages, and a deserted village.

In the large towns and in London matters are different, inasmuch that other buildings may readily be obtained capable of temporary conversion for factory purposes—buildings which were possibly erected under Building Acts or local by-laws beneficially influencing their construction.

There are, both in the provinces and in London, numbers of instances in which factories are separated into blocks on the opposite sides of roads, as shown upon Fig. 6, connected, where necessary, with bridges. Here it will be seen that there are several manifest advantages, especially with regard to fire risks; for, if any of the materials to be manufactured were likely to assist a spread of fire, these could be quite isolated from all other portions. Again, there is frequently a risk from fire in the packing-room, where straw and light wood, paper, &c., are frequently accumulated. In Figs. 6 and 7 the forwarding and packing departments on both floors are quite isolated from the other portions on every floor, the bridges giving all the means of access necessary for many classes of factories. The buildings are so arranged that three fire-resisting staircases afford, with the four bridges, ample means of exit or of communication with all parts of four buildings. The doors to the staircases all open outwards, but in such a manner as not to interfere with the stairway. All other doors of communication open in both directions, so as to afford the workpeople two directions of exit in the event of fire.

In Figs. 8 and 9 are shown two plans of another fire-resisting factory, where the staircases are arranged in suitable positions for a corner site. In this case the lift is shown with inclosure of brickwork, with iron doors to stay

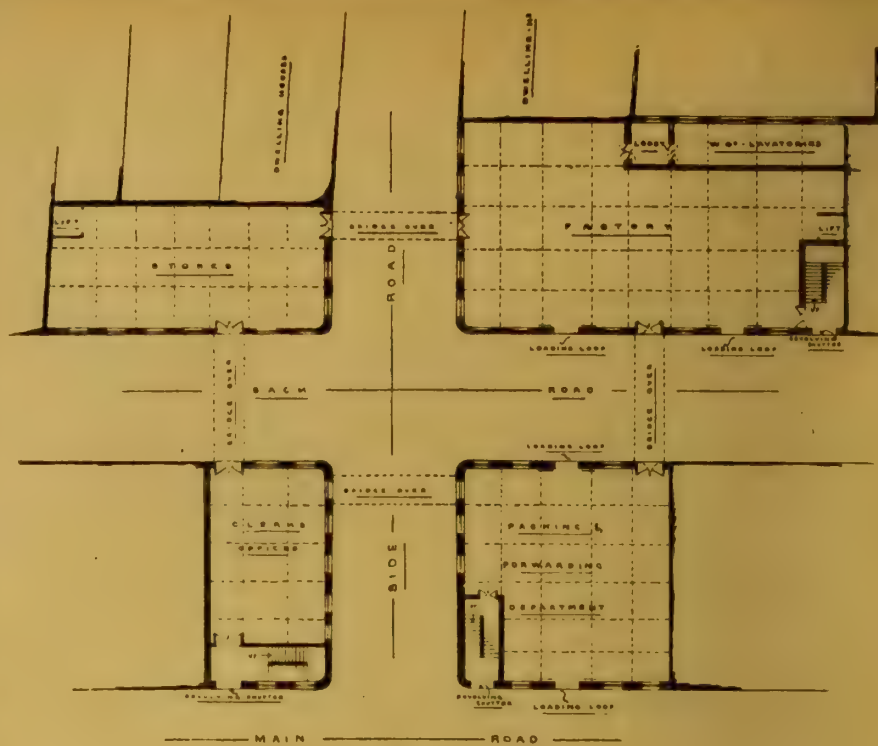


Fig. 6.

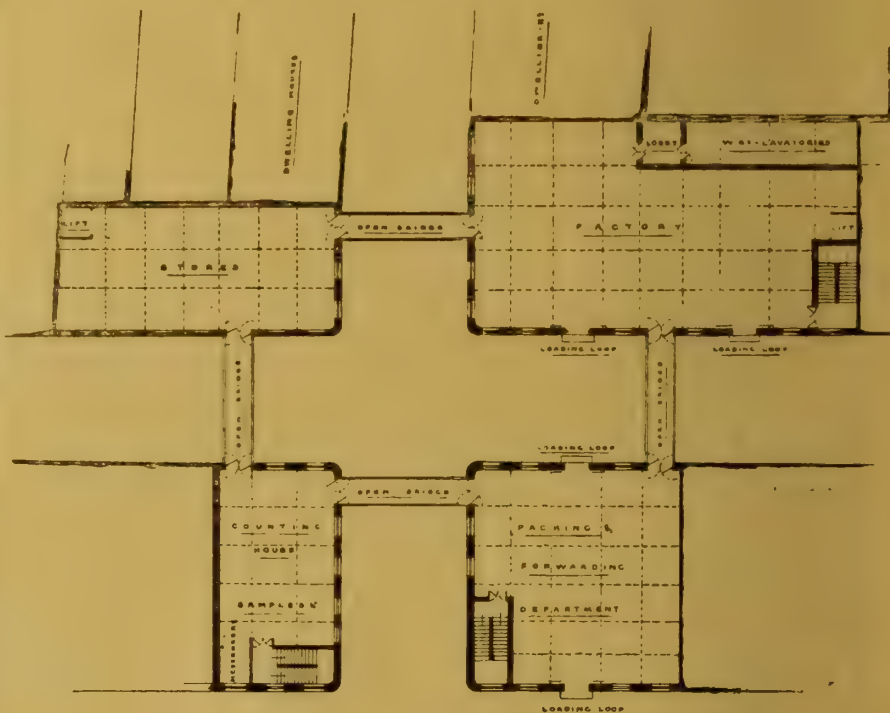


Fig. 7.

the progress of fire if necessary. The staircases are also inclosed in brickwork, which would be carried to a level above the roof levels in compliance with official requirements. The water-closets do not open out upon the workrooms, but into a lavatory. The exits are in direct communication from the staircases to the street, and as required by the Factory and Workshop Act, 1891, this factory is "provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as can reasonably be required under the circumstances."

An instance of the importance of providing a fire-resisting staircase (inclosed within brick walls and thus separated from the various apartments of a very large factory where the materials manufactured and the building also were alike subject to special danger from fire) has lately occurred in a remarkable manner. After representations had been made to the owner that his factory was not properly pro-

vided with safe means of exit for the escape of his workpeople from the upper floors, he was induced to construct a good staircase, which, with its inclosing walls, was thoroughly fire-resisting. This had scarcely been completed when a great fire occurred, nothing remaining of a great building after the disaster except the new staircase, the inclosures of which protected satisfactorily the woodwork of the doors, windows, &c., belonging to the staircase only, all else in connection with a very large factory being utterly burnt out.

In Fig. 6 I have given the plan of a factory connected (with its departments for stores, packing, and offices) by bridges, thus greatly reducing the risk of the spread of fire. The storage of explosives, petroleum, chemicals, and dangerous goods is largely subject to the control of public officials, but probably not to so great an extent, even in towns (where, however, certain manufactures and storages are absolutely forbidden by Acts of Parliament), as to prevent the possibility



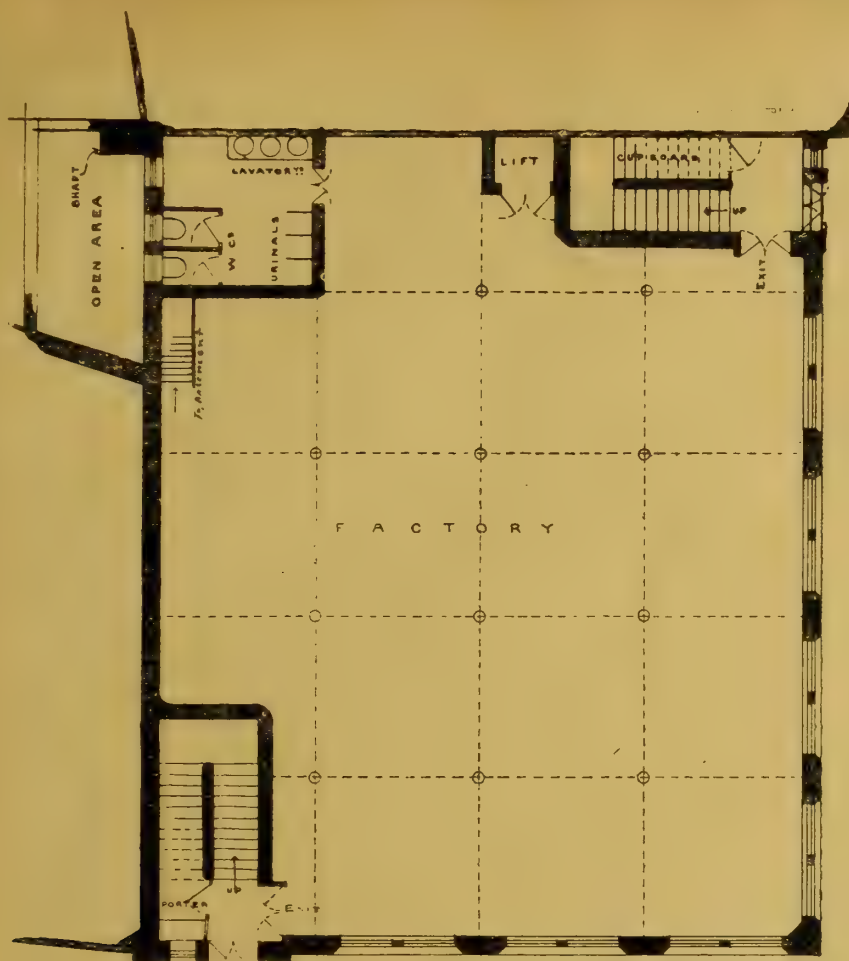


FIG. 8.

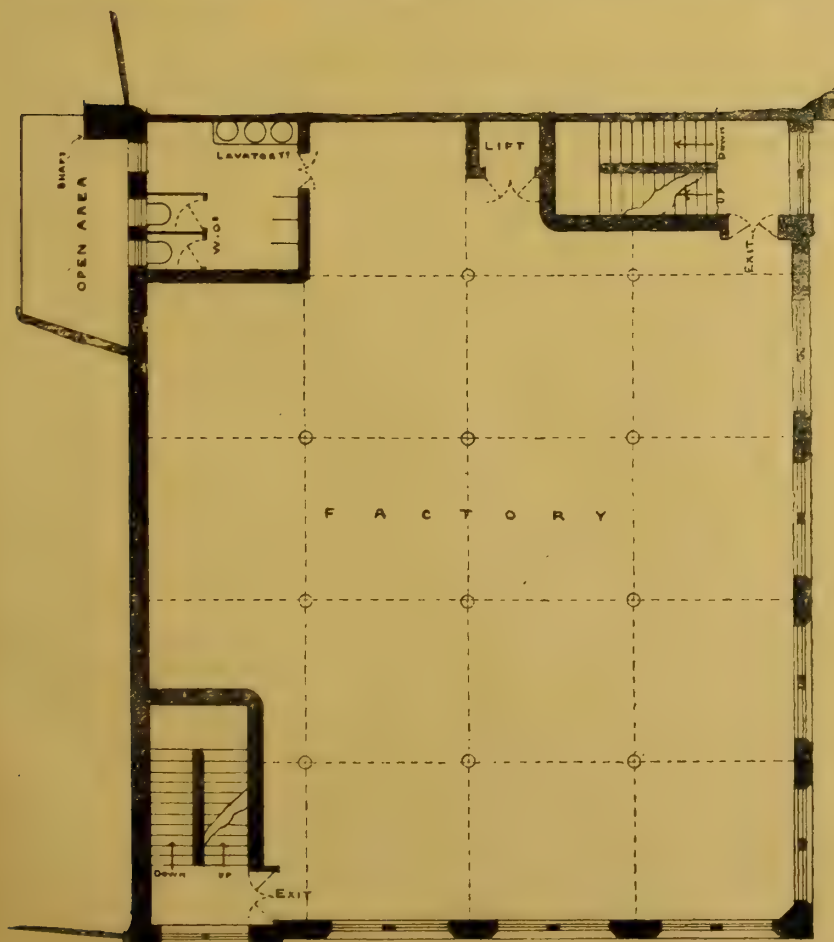


FIG. 9.

precaution for such purposes, yet there is exhibited undoubtedly a desirable arrangement for the purpose.

Such explosions were far more frequent twenty-five years ago than since various Acts of Parliament have been passed with the view of obtaining as a security that petroleum and other dangerous matters (largely used in waterproof clothing and other manufactures) shall be stored in suitable structures, and be kept under public inspection. The proper position of apartments for dangerous goods was, in former times, often thought to be in the cellars of a warehouse or factory, and I recollect that some thirty years ago a factory in Birmingham existed for the manufacture of percussion-caps. There were about fifty females employed upon the premises, which consisted of basement, ground, and three upper floors, with a frontage of about 40ft., and a depth back of about 30ft. An explosive (fulminate of mercury, I believe) was stored in the cellar. Every person in the factory and all the floors and the roof and the whole front wall were blown off the site, which I visited within ten minutes afterwards.

A curious result of this explosion upon the party-walls of the building, which were little injured, was that, although all the floors and roof and front wall were gone, the fires remained burning in one or two of the grates on the upper floors, and that pictures or small articles attached to the walls above the fireplaces still remained undisturbed in their places, these being so close to the walls as to escape the blast of the explosion and building materials as they were thrown upwards.

The various Factory and Workshop Acts which have come into force since the date of this accident have greatly caused the improvement of factory buildings; but it is a matter for surprise that so very many factories should exist which are structurally unsuitable for the safety, comfort, and health of the workpeople employed therein; the number of registered factories is 64,098, and of workshops 69,900. The regular periodical inspection of so large a number of structures therefore requires that about 500 factories and workshops should be visited and reported upon daily, if all are visited only once yearly—an impossibility with the limited staff employed in the Factory Department of the Home Office, and which (being composed partly of officers from the army and navy, and partly of persons otherwise than qualified architects and surveyors) cannot rightly be considered to fairly meet the requirements of the case, either as regards the number of officials employed, or their special qualifications for the work of surveying and reporting upon the structural condition of the factory buildings, and their suitability for their various purposes; especially as many factories can often be only structurally dealt with properly by qualified architects, and by them only with the aid of correctly-drawn plans and sections, and with that knowledge of machinery and engineering matters which is now more common amongst architects than was formerly the case.

Under the provisions of the Factory and Workshop Act, 1891, section 7, the duty of all sanitary authorities, including the London County Council (acting as such under this Act), is to require that all factories where more than forty persons are employed shall be properly supplied with means of exit; but section 2 of the same Act enables her Majesty's inspectors of factories to perform this duty should the sanitary authorities fail therein.

But the Factory and Workshop Act, 1895, section 2, appears yet further to throw the responsibility (of securing for workpeople sufficient exits from factories) upon her Majesty's inspectors as well as upon sanitary authorities, whose surveyors, frequently possessing higher architectural knowledge than the inspectors, would often be suitable officials for such work. The section 2 is as follows:—"A Court of summary jurisdiction may, on complaint of an inspector, and on being satisfied that any place used as a factory or workshop is in such a condition that any manufacturing process or handicraft carried on therein cannot be so carried on without danger to health or to life or limb, by order, prohibit the place from being used for the purpose of that process or handicraft, until such works have been executed as are in the opinion of the Court necessary to remove the danger."

The Factory and Workshop Act, 1895, taken in conjunction with the Acts of 1878 and 1891, undoubtedly provides the means of enforcing a higher structural condition of factory buildings than has generally existed hitherto. A factory has

of serious explosions from such causes, as well as in isolating steam boilers, &c., from buildings from steam boilers, &c. There is, therefore, a very largely occupied by workpeople, and great advantage in keeping apart such stores, and although Figs. 6 and 7 may show an extreme







SOME MINOR EXAMPLES OF THE  
FRENCH RENAISSANCE.\*

By G. A. T. MIDDLETON.

THE GROSSE HORLOGE, ROUEN.

OWING to its accessibility, Rouen is one of the best known of Continental towns to the English architect, and amongst its objects of



General View of the Grosse Horloge, Rouen.

interest the Grosse Horloge is by no means the least prominent. Built in 1527 A.D. as an adjunct to an older tower, it consists of an arch across a narrow street, bearing the great clock from which it takes its name above, and it exhibits the usual characteristics of the François Premier period, when to the refinement of the Italian Renaissance

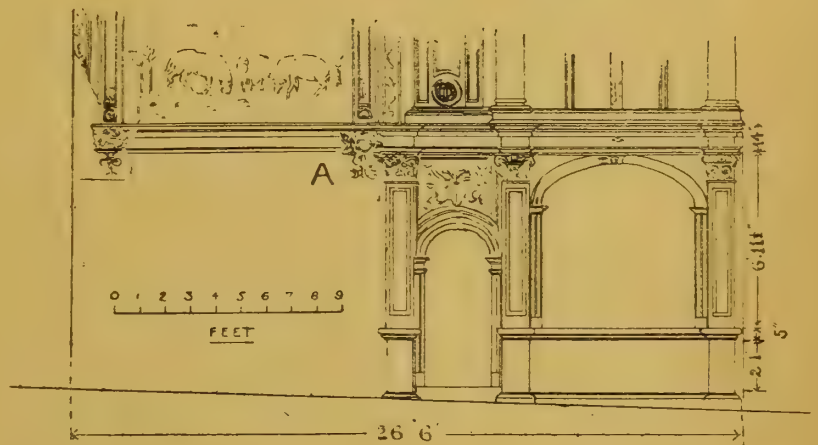


Capital from Flank of the Grosse Horloge, Rouen.

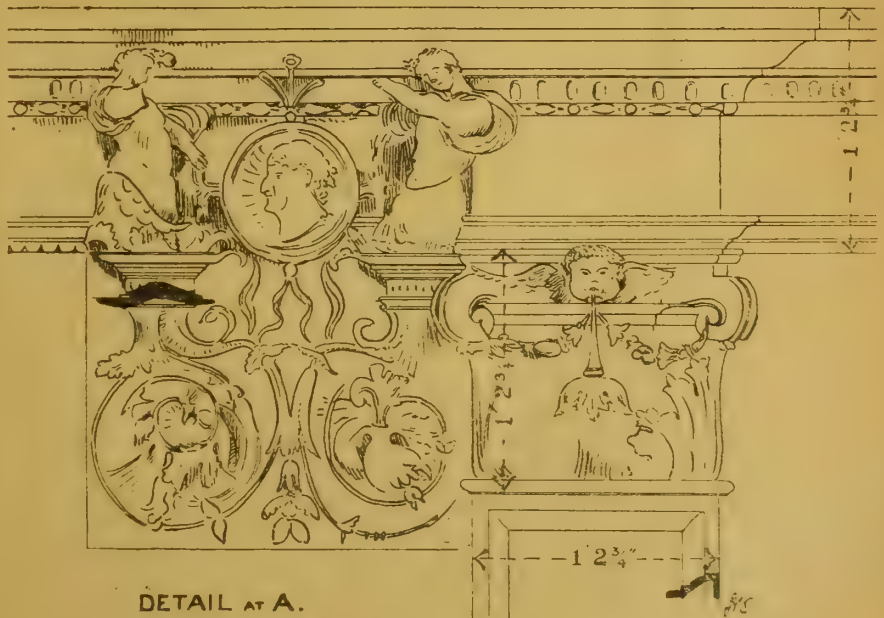
was added the originality, the love of figure-carving, and the delicacy of French treatment.

The general appearance is better in a sketch, possibly than in actuality, for the clock is over-brightly gilt, and the roof is modern; but the stonework needs to be seen to be properly appre-

\* All rights reserved.

FLANK OF THE GROSSE HORLOGE,  
ROUEN.

A D 1527.



DETAIL AT A.

ciated, its somewhat crumbled condition rendering it difficult to make proper drawings of, but yet some idea can be given of the great amount of unobtrusive detail there. No two similar ornaments exactly coincide, and even the two sides of apparently symmetrical capitals, while agreeing in general scheme, are different in arrangement, and careful undercutting of the work in comparatively low relief has been adopted to give the

effect of greater prominence, producing deep shadows where required. It will be noticed, too, that the breadth of the pilasters, 1ft. 2 1/2 in., is exactly contained in their height, including capital and the silk moulding which serves as base, the proportions being as 6 to 1; and, besides this, that the depth of capital and of entablature, which slightly overlap, are each equal to this same dimension.

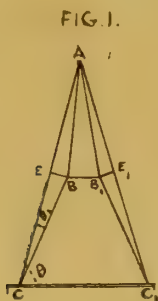


## CONSTRUCTION OF STEEL SPIRES AND STEEPLES.—I.

IN the BUILDING NEWS of May 29 last we published a description and elevation of the metallic framework adopted in the construction of the new Church of St. Mary the Virgin in New York. Although of an interesting character, as illustrating one of the numerous protean forms to which steel and iron have been applied in preference to their old time-honoured rivals, yet it does not pretend to put forward any particular claim of a novel character, or hitherto of an unattempted design.

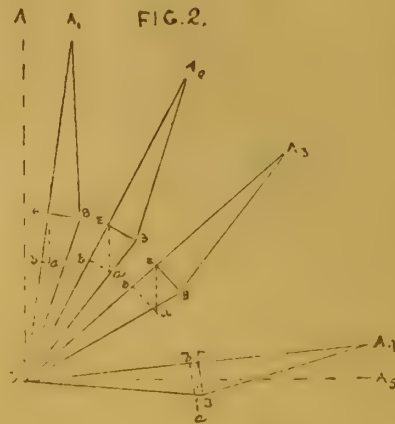
We propose now to place before our readers in a couple of articles a type of steel construction which unquestionably is of a novel description. We are not aware at present of more than two or three instances in which iron or steel has been employed to the purpose in question. Rouen Cathedral is one example; but in them all timber is more or less used. The great value and importance of the mode of construction we intend describing and illustrating is that not a particle of wood constitutes any part of the building. It is not a question of a timber spire or framework sheathed over with iron, zinc, copper, or other metallic substance; but of a steel spire built up and braced together internally by steel struts and ties, and then sheathed in metallically on the exterior surface. One reason, and perhaps the principal, why iron and steel have usurped the rôle formerly played—and, so far as early requirements demanded, very successfully—by other materials is that the different forms or contours which the latter were susceptible of assuming were exceedingly limited consistently with the strength required. Without alluding to cast iron, which is not suitable for the type of design about to be investigated, the perfection to which our rolling mills, our riveting, planing, shearing, drilling, punching, and forging machinery has been gradually advanced enables iron and steel sections to be turned out of the workshops in almost any form that might be called for. The times are past when any object of the nature of a design could only be produced in melted metal. In fact, they have been bygone many years ago. The celebrated wrought-iron gates worked and tooled by Quintin Matsys are still to be seen in St. George's Chapel at Windsor Castle.

It may be as well to give a little consideration to the principles which govern the construction of all spires and steeples, for of whatever material they may be built the general form and external appearance will be found to retain their original characteristics. A church spire may be regarded as a vertically triangular pyramid with a disproportionately limited area of base compared with



its height. Or, again, if a vertical section be taken through the centre, it may be viewed in the light of a roof with a pitch of almost an abnormal angle, and with the same relative proportion between the area and height to which attention has been directed. In treating of the new type of steel spires the internal bracing will be subsequently seen to be designed and carried out in strict accordance with the principles governing the arrangement of the parts and members of roof-trusses. Those who have perused our recent articles on "Steel Bridges" will have but little difficulty in recognising the internal building-up of the steeple as merely a somewhat different application of laws already laid down and abundantly proved by practical examples. The absolute weight on roofs of all descriptions is comparatively small with the enormous loads now brought upon bridges, the columns and girders of gigantic warehouses, and upon the foundations carrying them. The former are neverthe-

less exposed to very severe stresses and bending moments due to another cause, which will be a subject for future investigation. Apart from the action of the last-mentioned cause, the actual weight per unit of area upon roofs of a given span and pitch can be calculated *a priori* to the actual design with an accuracy that leaves little to be desired. There are, no doubt, numerous methods of covering a roof, whether of iron, steel, timber, or other material. But as the principal items of the total weight in any bay are the main rafters, the small rafters, if any, and the purlins, a little extra load more or less in the absolute



covering is of but small account. A very small percentage will, in iron and steel roof trusses, atone for the difference between the maximum and minimum.

A reference to Fig. 1 will serve to point out how a slight modification in form will make an ordinary roof truss to act in the capacity of a spire or steeple truss. In the figure A B C and A B1 C1 are the two half-trusses of the simplest type of roof-framing, and although since church spires are seldom less than from 80ft. to 100ft. in height, a more complicated truss, with many additional members, would be required, yet the example given is sufficient to fully demonstrate the truth of the general principle involved. In all designs of roofs, unless they be of exceptional shape and dimensions, the most heavily-stressed members are the rafters, which are represented in Fig. 1 by A C and A C1. Occasionally the inclined ties, C B, C B1, are also stressed nearly up to the same extent in an opposite sense. The actual stresses upon these ties, as well as on those A B, A B1, and B B1, will depend in some degree upon the value of the angle  $\theta$ ; but the quantity which really governs the stresses upon the whole truss is the angle  $\theta$  or angle of the pitch of the roof. As the effect of this datum is a very important one in the design and construction of spires, it will be well to analyse it a little in detail. Restricting our attention for the present to the case of the stress upon the lower part of the rafter, C E, in Fig. 1, it will be found to vary with the value of the angle  $\theta$ , and also to vary not in the direct ratio of the increase or decrease of the angle, but as some function of it, or some quantity whose value varies with that of the angle itself, such as its trigonometrical functions represented by its sine, cosine, tangent, or some combinations of them. It will suffice also for our present purpose to consider one half of the spire truss and the action of a single weight acting at the centre of the rafter at the point E. It will facilitate the explanation to refer to Fig. 2, which is lettered to correspond with the skeleton elevation in Fig. 1. In the separate half-trusses in Fig. 2, the weight at the centre of the half truss at the point E is represented in all of them by the line E a, and is equal for all of them and drawn to the same scale. Commencing with the half-truss A1 C B A1, the weight at E is plotted to any convenient scale equal to E a. From the point a the line a b is drawn parallel to E B, and the line a b is equal to the stress upon the strut E B, and the length of the line E b will give the stress upon the rafter or upon the lower part of it, E C. Let the half-truss be shifted into the position A1 C B A2, all the dimensions being maintained constant except  $\theta$ , the angle of the pitch of the roof. As a result the stress upon the strut E B becomes less, and that upon the lower part of the rafter E C

greater. The effect of altering the angle  $\theta$  is still more apparent by supposing the half-truss to be placed in the position at A1 E C B A1, which points out that the stress E b upon the rafter is approaching its maximum, while the stress a b upon the strut is verging towards its minimum. If the half-truss were placed with the rafter in a vertical position—that is, in the line C A, the component a b would vanish altogether, and the stress upon the rafter would be equal, theoretically, to the weight itself, an equality which is not produced by any other position of the half-truss. Practically, when the rafter becomes vertical the weight itself vanishes also. Since the position of the half-truss in A1 C B A1, fairly represents that occupied by a spire truss, a very good idea can be formed of the manner in which some of the stresses upon the frame exert their actions.

In order to obtain a thoroughly accurate and clear comprehension of the action of stresses, it is always advisable to select extreme cases in theory, or while one is engaged upon what may be termed working out the problem before one. A slight modification of the parts is of little use; but if examples be chosen in which there is considerable diversity in the original data, the result becomes at once manifested upon a scale which cannot be inadvertently neglected. The almost vertical position of the half-truss at A1 C B A1, has already been considered, and it remains now to investigate the stresses when the truss is placed in exactly the opposite position—that is, at nearly right angles to its former one. In Fig. 2 this case is exemplified by the position of the half-truss A1 C B A2, which is purposely placed nearly horizontally. As the same letters represent the same stresses upon the same members, it will be seen that those upon the rafter and strut are exactly reversed. That upon the strut is nearly a maximum, while that upon the rafter is very close upon its minimum. If the half-truss were still further lowered down until the rafter C A1 occupied the horizontal position C A2, the stress upon the rafter would become equal to zero, while that upon the strut would be a maximum and equal to the weight. The strut E B would occupy the place of the line E a, and both components of the vertical weight would disappear. In no case, whatever may be the position of the half-truss, is the stress upon either the rafter or the strut greater than the weight.

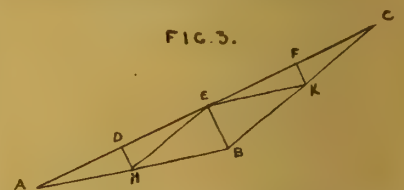
The analytical and mathematical proof of the conclusions arrived at in the diagrams in Fig. 2 present no difficulty. Put W for the weight at the centre of the half-truss at E. Let S = stress upon the rafter, S1 that on the strut, and  $\theta$  = the angle of the pitch of the roof. Then for the stress upon the part of the rafter E C we have—

$$S = W \times \sin \theta$$

and similarly for that upon the strut E B—

$$S_1 = W \times \cos \theta.$$

Both these stresses are compressive, as can be



readily found by the ordinary rule. It will not be necessary to investigate the intermediate positions of the half-truss, but only the two extremes. If the rafter is supposed to be in a vertical position, then the angle of pitch becomes equal to  $90^\circ$ , and the equation resolves itself into—

$$S = W \times 1 = W.$$

This would be the stress upon the assumption that the rafter was severed at the point E, and the weight placed there, or if it were placed at the apex A. If the other extreme position, that represented by the line C A2, be assumed for the rafter, the equation, bearing in mind that in this case the angle of pitch equals zero, is written—

$$S = W \times 0 = 0.$$

In the first or vertical position, the stress upon the strut vanishes, since angle of pitch equals  $90^\circ$ , and the formula is—

$$S_1 = W \times \cos 90 = 0.$$

For the horizontal position at C A2, the angle of pitch equals nothing, and we have—

$$S_1 = W \times \cos 0 = W \times 1 = W.$$

In this instance the strut E B becomes vertical,



and supports the whole of the weight. Indirect or transferred stresses are subsequently induced upon the ties C B, B A<sub>1</sub>, B A<sub>2</sub>, &c., which pull again upon the parts of the rafter, C E, E A<sub>1</sub>, E A<sub>2</sub>, &c.; but the investigation of these stresses will be given in a subsequent article.

The height of the spire will very considerably modify the exact type of truss to employ, in precisely the same manner as the span of a roof or bridge truss will determine the arrangement of the tensile and compressive bracing necessary to prevent distortion or deformation. The truss represented in Fig. 1 would obviously be unsuitable for any church steeple or spire except for one of very limited dimensions, such as the small examples surmounting places of worship built of corrugated iron. A more adaptable type for the purpose is shown in Fig. 3, in which the length of the rafter is better subdivided, and additional bracing introduced to complete the framework. A notable difference between the designs in Fig. 1 and in Fig. 3 is that in the former there are not any secondary or subsidiary trusses. Each half principal has one primary truss and one only—viz., A E C B A. But in the example in Fig. 3 there are, first the primary truss A E C B A, and secondly a pair of secondary trusses A D E H A and E F C K E. As the span, and consequently length of rafter increases, unless subsidiary trusses and bracing were introduced, the unsupported members in compression would become so long as to be in danger of being exposed to stresses of a transverse character, and consequently to a serious amount of deflection. It is the object of all secondary trusses to prevent the occurrence of all stresses of a transverse nature, and to maintain the normal stresses both of tension and compression in the line of the geometrical axis of every member of the truss. At the same time they only effect this very necessary result by bringing additional stresses upon the parts of the primary truss as well as upon each other. The term of "French" truss has been given to the type represented in Fig. 3, and it is a very neat, useful, and economical form for spans not exceeding about 150ft. In the construction of steel spires, tie-bars precisely similar in general direction to H E and E K in Fig. 3, are always employed, as will be pointed out subsequently in a detail drawing.

#### THE CONGRESS OF FRENCH ARCHITECTS.

THE Congress of French Architects, organised by the Société Centrale des Architectes, was held this year at Paris during the past week. The opening meeting took place on Monday, the 15th inst., in the hémicycle of the Ecole des Beaux-Arts, and was presided over by M. Achille Hermant, in place of M. Charles Garnier, who was indisposed. The chief subjects for discussion, besides those of sanitation, fees, competitions, and mutual defence, were the respective rights of the proprietor and the architect to the plans and drawings constituting a contract passed between the proprietor and the contractor before the architect; the architecture of Portugal from Roman to modern times; the system of construction called *cement armé*, and the decoration of the same. Visits were made to various new and interesting buildings at Paris, and an excursion was made on Thursday to the town of Reims, which contains a large number of interesting ancient monuments. The Congress was closed on Saturday by the usual annual distribution of awards made by the Société Centrale, terminating with the traditional banquet.

At the first sitting, M. Hermant opened the discussion concerning the rights of the client to the property of plans, drawings, &c., constituting the contract between the client and the contractor; the rights of the architect to the original drawings, &c., prepared by him for the client; and the eventual rights of the architect to these same drawings, be they originals or copies. After a lengthy discussion between several Parisian lawyers and a number of well-known architects, amongst whom were MM. Lucas, Boileau, Daumet, and Hermant, the following resolutions were passed:—(1) That the drawings, consisting of plans, sections, elevations, interior and exterior elevations, working details of construction and decoration, constitute, as a whole, the original of the work of architecture, and remain the property of the architect. (2) That the building, when executed, is simply a reproduction of the original idea granted by the architect to his client, the architect transmitting to his client, the absolute owner

of the building, the enjoyment only of his architectural conception. (3) That the architect remains owner of all the drawings prepared by him, owing, however, to his client before the termination of the building a signed copy of the accepted plans. (4) That for the needs of professional or general education it is well to allow students of architecture and the general public the right of studying or copying public and other buildings; but these copies may not be reproduced or multiplied for any commercial or industrial end without the consent of the author during the continuance of the rights granted by law.

On the following day (Tuesday) the members of the Congress, to the number of nearly three hundred, visited the new Greek church in the Rue Bizet, a remarkable building recently constructed from the designs of M. Vaudremer, membre de l'Institut. This church, of a style somewhat Romanesque—a style special to this architect, whose work is much admired by reason of its sincere expression of form and its logic both as regards construction and decoration—is worthy of a lengthened visit. The interior is most harmonious both in form and decoration; the church furniture, the bishop's chair, the iconostase, and the altar are wonderfully designed as regards ensemble and details; the mural paintings, by M. Lameire, are full of religious sentiment, and harmonise well with the style of the interior.

The next visit was made to a very interesting private mansion, built from designs by M. Paul Sedille, in the Rue Galilée, followed by an inspection of the mansion just completed for the Russian Ambassador, Count de Montebello, from designs by M. Boileau, secretary to the Société Centrale. This building, which is the *chef d'œuvre* of the well-known architect, is remarkable for the originality of its façades, its principal staircase, and the artistic decoration of the interior. The immense private mansion lately completed for Prince Roland Bonaparte, from designs by M. Janty, formed the object of the next visit. This building, costing over £120,000, has its principal façade, Louis XV. in style, on the Avenue d'Iena; the interior forms a veritable palace, and contains a number of immense and well-arranged salons, galleries, and reception-rooms. The library of the Prince, containing over 130,000 volumes, is very charmingly designed in the style of Louis XIV. The last visit was that made to the new scenery depots of the Opéra and Opéra Comique, which have just been completed on the Boulevard Berthier. These two buildings, which, owing to the heavy risks of destruction by fire, have been wisely placed on the outskirts of Paris, are very artistically designed as regards their façades. The interior arrangements allowing every facility for free inspection, and assuring every precaution against the risks of fire, are very interesting.

On Thursday the members of the Congress, to the number of a hundred, made an excursion to Reims, guided by M. Corroyer, Inspector of Diocesan Buildings, and M. Boileau, architect, secretary to the Société Centrale. Visits were made to the Triumphal Arch (a relic of the Gallo-Roman epoch), the town hall, to several remarkable old houses in the Rue Tambour, to the Maison Belleau (interesting for its magnificent ceiling of sculptured beams and rafters), and to the old theatre. A long visit was made to the Reims Cathedral, conducted by the diocesan architect, and an interesting visit to the church of St. Remi. The various discussions were continued by the Congress at Paris. The question taken up concerning the systems of construction with *cement armé*, an interesting method much discussed and fast coming into use at Paris for all kinds of buildings, is one which may be found worthy of forming future articles, explaining the three chief systems in use here, two of which systems are now being employed for the floors and arches for the new building for the Society of Civil Engineers of France, now under construction in the Rue Blanche.

On Saturday, a meeting of the Congress was held in the hémicycle of the Ecole des Beaux-Arts, under the presidency of M. Charles Yriarte, representing the Minister of Fine Arts, for the purpose of distributing the awards and medals given by the Société Centrale des Architectes Français. The medal of honour was awarded to M. Louis Heret, for his remarkable studies and executed work of private architecture. The first silver medal was awarded to M. Emile Ulmann, the second silver medal to M. Ernest Ujmy, and the third medal to M. Joseph Galinier, of

Toulouse, all three for their works of private architecture. The medal of jurisprudence is awarded to M. Henri Bunel, chief architect to the Prefecture of Police. Silver medals for archaeology were awarded to M. Albert Ballu, for various restorations of ancient buildings and archaeological researches in Algeria; and to M. de Vesly, professor at the School of Science at Rouen, for his interesting archaeological work in Normandy.

The medal of the French School at Athens was awarded to M. Couve for interesting researches made at Delphos and Delos; and that for studies of French monuments to M. Petitgrand, diocesan architect. Medals of less importance were awarded to the most promising student at the Ecole des Beaux-Arts; at the Ecole des Arts Decoratifs; to the most deserving representative of art industry; to a mason and stonemason belonging to the Cercle des Maçons; and to numerous workmen showing special intelligence and skill in the exercise of their various trades connected with building.

The sub-committee entrusted with the study of ways and means for the proper teaching of architecture in the provinces, comprising delegates from thirty societies, discussed the question concerning the necessity of forming three distinct degrees for the teaching of architecture, the higher, the secondary, and the primary, and the formation of schools corresponding to these three degrees. The higher school would be that of the Ecole des Beaux-Arts, at Paris, secondary schools would be formed in a small number of the principal towns, and a large number of schools for the primary studies in every department of France wherever possible. The members were of opinion that it was advisable to endeavour to create a unity of method in the study of the various schools, despite the various temperaments of each department or province. This unity would be maintained in the examinations of the secondary schools, the best pupils of which would be drafted to the higher school at Paris, others receiving a certificate at the termination of their studies at the provincial schools. A sub-committee was entrusted with the preparation of reports which would be passed and transmitted to the various societies and public powers. It is hoped that such measures will raise the average of the study of the profession of architecture in France.

#### STENCILLED FABRICS AND WALL-HANGINGS.

AN exhibition of no little interest, and one of decided novelty, has been open to the inspection of architects and the artistic-minded public at 21, Bloomsbury-street, Bloomsbury, this week, by Messrs. Aldam Heaton and Co., who are making a feature of the application of stencilling to curtain fabrics and mural hangings. The process of the stencil is practically "as old as the hills," and for centuries the Japanese have, of course, practised the art with the greatest success. Very little worthy of imitation has, however, been done in England. The Gothic Revival was, at any rate during the earlier associations of the movement, distinguished in its decorated methods by the use of tin stencil-plates, with which crude and excessively ecclesiastical scrolls and wiry ornaments were executed in body colours of the newest description on pitch-pine framings well stop-chamfered. Music-halls and cheaply-built places of assembly were touched up, too, with stencil work, done for the most part in white-washed grounds in tempera colours, arranged generally in stripes as well as in imitation of masonry jointings. Otherwise, in England, the stencil has been greatly overlooked during the last fifty years, and the occasional uses to which it was put certainly did not render the method attractive. For about twelve years a development of the application of the stencil for wall-papers has been going on, and Mr. Aldam Heaton has demonstrated its adaptability in respect to tertiary and graduated colours to be in every way superior to block printing where artistic results are a consideration. The difficulty previously realised by those who endeavoured to stencil fabrics has been the impossibility of washing or properly cleaning the materials so decorated, and, quite beyond any question of design or colour, this is the precise difficulty which Messrs. Aldam Heaton and Co. have successfully overcome. The stuffs decorated by their stencilling process will bear any amount of washing, and even "Sunlight soap," with its powerful alkaline qualities has been used without causing the colour to fly or run



notwithstanding their being dried slowly. The papers, too, we understand, will bear washing with a sponge and soap and water. Those who have not seen this exhibition will find it well worthy of their attention, and, moreover, the prices charged are strictly in competition with block-printed chintz and other materials. The examples shown display considerable variety, and the patterns are bold and good in drawing, excellent in colour, and can be adapted to any required height or width to fill any given space, with a design complete in itself, being made specially for its position, merely insuring an individuality without waste. The mohair stuff, with its natural sheen, takes the colours beautifully, and the "balk cloth," with its natural cream-colour as it comes from the wool, leaves nothing to be desired as a handsome surface for the reception of the richest-coloured foliations. Other specimens are in Bradford twill, moreen, taffeta, padded lining, and union cord, ranging in price from 4s. to 17s. 6d. a yard, finished in hand-decorated patterns. The better the material the better it hangs, and, of course, the longer it will wear; and, besides, the mohair surface breaks up the colour so well and imparts to it a lustre of much value, as shown by its graceful folds and soft texture.

Another feature in this collection of stencils is Mr. Heaton's "crape-faced" paper, which exhibits an indefinite blocking impressed by steel rollers, giving to wall-papering the enhanced effect secured by the woven texture of the fabrics, and by the employment of clear colours over this surface and upon an under-stencil, it is worthy of note how varied and graduated a result is obtainable with the rubber, by the means of which alone the colour is applied. In the same galleries there are a great variety of furniture exhibits and wall treatments, at once suggestive and individually interesting. The painted bass and deal bedroom suite, with foliations and figure panels in clean brown pigments, done after an old German model, may be mentioned as among the novelties of artistic value.

#### CONCERT-HALLS AND ASSEMBLY-ROOMS.—XXI.

By ERNEST A. E. WOODROW, A.R.I.B.A.

SOME brief reference must now be made to that large class of buildings, both at home and abroad, which is covered by the term music-hall. The inclusion in this series of these halls is called for because they are, strictly speaking, both concert-halls and places of assembly, and whatever their development may have been in the past few years as theatres of varieties, it is well known that they originated from the concert-room attached to the public-house. There is no doubt that the free-and-easy concerts which used to be indulged in in the bar-parlour extended gradually in scope until they created the demand for more extensive accommodation than that room afforded, then, step by step, the hall with a flat floor and raised platform developed into the theatre of varieties with galleries and fully-equipped stage, such as we are all now familiar with. When at first the audience were contented with entertaining themselves, a small room in a public-house sufficed; but when professional talent was required it became necessary to increase the seating space so as to pay the extra expense. Once the *artiste* was introduced, the theatrical element in the arrangement of the building had to follow, and so public taste influenced the form of the building, and architects have produced as variety theatres some of the finest assembly-halls we can claim in England.

I have made frequent reference in these papers to the well-known hall in Leicester-square, the Alhambra, Figs. 1 and 2, which was so skilfully raised by the architects, Messrs. Perry and Reed, from the ruins left after the fire which destroyed the old Alhambra in December, 1882. How the construction of the old and new hall differs I know well, as I had the opportunity of examining the effect the fire had made upon the building when I visited the ruins before they were cool. But quite apart from construction, the Alhambra can claim merit as being a building devoted to variety entertainment, and yet having an auditorium with architectural pretensions. True there are other music-halls not totally devoid of treatment other than that afforded by the plastic decorator and the theatrical painter, whose one desire is a lavish use of gold leaf and cream colour, but they are so few compared with the number of

music-halls that exist that one welcomes gladly those which have some claim to design.

Why is it that music-halls are made vulgar through lack of architectural skill? Nobody can deny the fact that to one hall which is decent in design there are twenty which are atrocious,



FIG. 1.

and not only atrocious in decoration, but in planning as well.

I am familiar with halls of recent erection, where it is impossible to see the stage from any of the side seats, other than the front row, in balcony or gallery, and there is a notable example of a hall which had to be closed some few months after it was built, because the people who went into the gallery wanted their money back when they found they could not witness the performance. And the men who designed (?) the plans called themselves architects!

Because a hall is devoted to a class of entertainment which certain sections of society do not consider of high merit, there is no reason why the building should be bad, even if the performance is considered by some to be so. I would say if you wish to elevate the performance, improve your buildings, for the better the building the better the class of people who will attend, and then the demand will be for a better class of entertainment. This has proved itself over and over again. If a skilled architect rebuilds a music-hall so as to make it an architectural success in all respects its whole environment is affected.

That a good building draws a good company,

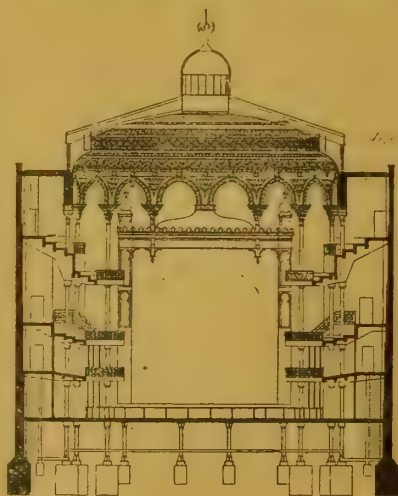


FIG. 2.

both in front and behind the footlights, is seen from the example of the Palace Theatre. Some of my readers may say that this is not any concern of the architect, and that I am dwelling on points outside his consideration. I contend I am not, for it should be the one aim of the architect to produce the best building possible, and with his art

to exercise the power of good influence with which it endows him, and even on a music-hall his art will not be thrown away. I speak not only of colour, decoration, and design, but of planning, sighting, and construction.

In the Alhambra we have a type of one of our large West End "palace of varieties" as they are so frequently named. It was the first so-called fire-proof theatre built in London; the concrete was made to a great extent from the bricks of the old building, broken up by powerful steam crushers and mixed with Portland cement; the new building thus literally sprang from the ruins of the old one. The whole of the floors, galleries, roofs, partitions, box divisions, and staircases are of this fire-resisting material, no timber other than that of the stage and furniture being used in the building. This music-hall was one of the first to have the cantilever construction applied to the overhanging balconies. A special feature to be noted is the forethought of the architects in so constructing the ceiling that the periodical cleaning and re-decorating can be done without scaffolding, and, therefore, without interruption to the nightly performance. The ceiling is dome-shaped, constructed of light iron framing with fibrous plaster panels, which can be lifted out of the frames, repainted, and replaced. There is an external dome

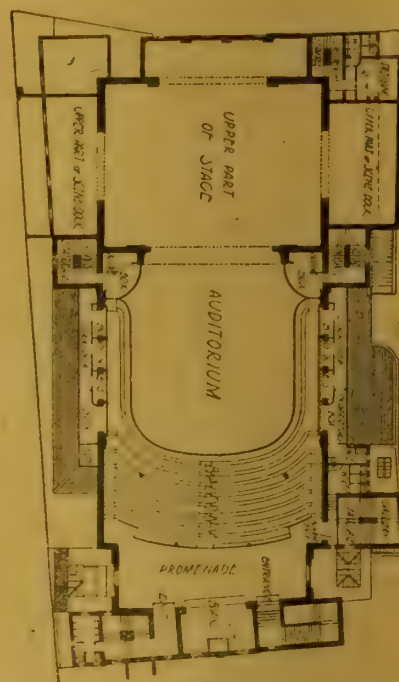


FIG. 3.

over the ceiling, which springs in iron ribs from the columns to a central ring which supports the cupola.

Over the proscenium is a sounding-board, formed as shown on the section, Fig. 2. This also serves the purpose of concealing the massive iron girder which spans the opening. The girder is 44ft. long and 6ft. in depth. The proscenium opening is 32ft. wide by 41ft. high.

I illustrate one of Mr. Frank Matcham's finest halls, which is most appropriately designed for the needs of an East-End audience. The plan and section represent the Paragon Theatre of Varieties in the Mile End-road (Figs. 3 and 4). Like all this architect's work, there is not a seat in this hall where you cannot obtain an uninterrupted view of the stage. The large and open auditorium renders it bearable to sit in this hall in spite of numberless pipes and East-End cigars. This is an assembly-hall where the special needs of the case have been considered with care and success.

I spoke at the commencement of this chapter of the probable origin of the music-hall, and I now give an example of this in the Oxford. This was originally a public-house—The Boar and Castle—and the vestibule of the present house is on the site of the actual entrance-gateway to the old coaching-yard of the inn. It was Mr. Morton who first constructed a hall in connection with this old coaching-house, and we read that it was in its time the finest hall in London, 94ft. long by 44ft. wide and 41ft. high, furnished



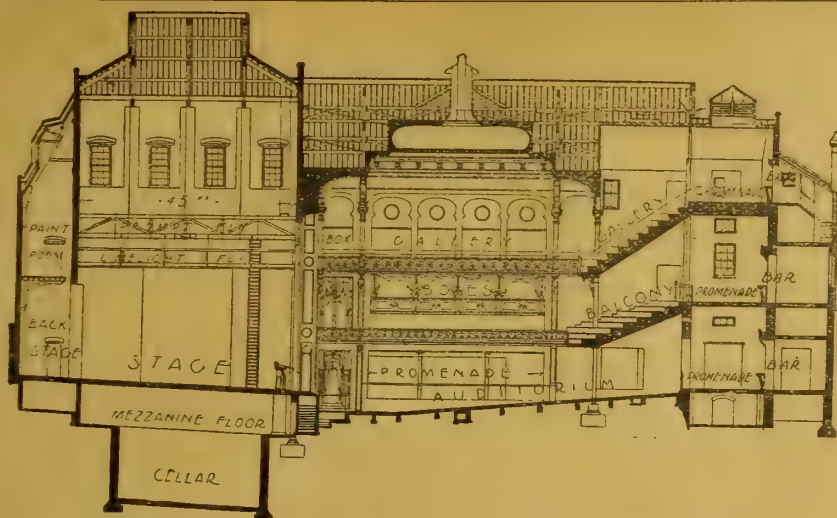


FIG. 4.

with roomy promenades behind the well-known Corinthian columns, which have been described as so nobly supporting the roof and obstructing the view. In 1868 this hall was burnt down, and after reconstruction in 1872 the same fate was

portant as the theatre. The same rules which govern the safety of the public in theatres govern that of the frequenters of music-halls; the construction of the one is similar to the construction of the other: rules of sighting and acoustics are equally applicable to both; fire protection is as needful in one as in the other; entrances and exits are required in equal proportions to the numbers accommodated in either building, and the authorities deal with them on the same basis as regards planning and construction. Why, I ask, therefore, do not architects also look seriously upon a music-hall as a building worthy of their best efforts, their best art, and their best work in all its branches? The public are tired of the public-house-like interiors, with gilded mirrors and vulgar glare. They have shown their appreciation wherever better work has been done, and how is it the old class of hall has not yet died out?

#### NOTES FROM EDINBURGH.

THE record of the six months' experience nearly past has amply justified anticipations formed at the opening of the year as to the prospects of the building trades. The unprecedented open weather of the winter months, followed by a spring of ethereal mildness, rare in Scotland, at least, in Edinburgh—well abused for its long-lasting easterly gales—have permitted all work in hand and in every department to go briskly on. The condition of the weather, which has been so generally advantageous, is credited with having occasioned considerable delay in carrying on the greatest work now in hand—viz., the reconstruction of the North Bridge. The stone piers were ready for the ironwork long before the latter were in a condition to be forward, the preparations of the work having been made on calculation of the recurrence of ordinary winter weather. The confused heap of ruins to the east of the bridge has all been cleared away with exception of the debris of excavation at the new tunnel on the north side. The work of reconstruction of the massive boundary walls, as well as a portion of the sheds beyond the main one, is far advanced towards completion. Two of the three arches and a portion of the third have been erected, and a pretty fair idea can be formed of the general appearance when completed. This will not shock the public taste by any curious novelty in the economic or constructive disposition of the materials, but follows the usual type of construction in stone. It will be a great adornment to the city and an improvement on the one removed, which was not in any way remarkable except for the substantial character of its masonry, the work being in perfectly good repair. Until the whole is complete, with its parapet and scaffolding away, the gracefulness of the long line of junction between old and new town will not be observable; but it may safely be assumed that it cannot be worse than that of the old bridge. To the west of the bridge there is nothing but confusion and clearing away of shed-roofs and buildings and debris. On the north side there is now clearance made to the natural surface and far below in some parts, above which the still standing tenements in Princes-street tower with an altitude which will make the western aspect of the new buildings, when erected, loftier than any

in the city, not excepting the new frontage of the extensive alterations to be made on the municipal buildings. This scheme has been so far matured and reported on by Mr. Robertson, of H.M. Board of Works, that a large portion of the whole—the western, including, among other improvements, the new council chamber—will be forthwith begun. This long-debated question has at last been settled, and in a way that will not fail to meet with general approval—both in respect of the old historic and most central site being retained—as well as in respect of the great economy secured in the provision of a suitable site.

So long as the question of better municipal buildings was open, the erection of a civic hall worthy of the city has been in abeyance. The site of the extended scheme is not too large for the present requirements of the public departments, without provision for a hall. The circumstances, which still have left the city hall unprovided for, may have had something to do in the ways of giving occasion for the presentation of another to the many splendid benefactions which have done more than public companies or public subscriptions to make Edinburgh beautiful and picturesque. The buildings of architectural note erected of later years would make a goodly list. Government has built the Post Office, National Gallery, and the Assembly Hall. The railway companies have at last provided for stations which will not bring any reproaches upon the city. But the costly architecture of Queen's Buildings, the new National Portrait Gallery, and the new University Hall are all indebted for what they are (as architectural embellishments of the city) to the liberal devising of private citizens who have provided for the amenity with other and more essential advantages. In his munificent offer of £100,000 to the corporation of the city, Mr. Andrew Usher has given a most timely and considerate gift, as well as a most costly one. He has also given it unconditionally, but with the desire expressed that the work of erecting a new town hall be proceeded with at the earliest possible date. There will be the usual difficulty of acquiring a proper site. It has often been suggested that the present music-hall and assembly-rooms might, by some economical arrangement, be superseded by a large and more convenient hall for public meetings, and certainly any site in George-street, which is one of the widest, would be also central, and with as convenient access as any in the city.

The efforts lately made by the city to extend its boundaries has been only partially successful, and the most important addition, that of the burgh of Leith, still stands aloof, though the two are practically one as far as continuity in the buildings can make them so. The feeling in Leith appears to be that it will be so incorporated as to lose the prestige of its antiquity and be Leith no longer—a sort of sentiment which a more unprejudiced apprehension of economic and other advantages, if these can be demonstrated, will sooner or later dissipate.

All departments of the building trades are now fully employed, and wages are certainly rising. A strike on the part of joiners, occasioned by some dispute about overtime charges, has been happily adjusted. The city is building tenements of working men's houses in Dalry, and have carried out important improvements for the western districts. A new iron bridge for general traffic has been built at a cost of £1,600, a wider road has been completed between the West End of the City and Dalry, with subway between Dalry and Fountain Bridge, and these, with other conveniences, at a cost of about £40,000.

Another, and somewhat mysterious, agency is still at work, as it has been for many years, in doing its part towards the improvement of the city. It sometimes comes to the surface as "The Social Union," but generally resolves itself into the agency of Professor Patrick Geddes. Anyhow, it has already made its mark on the architecture of the city, the sphere of its operations being confined to what may be designated the slums of the old town. Somehow or other, there is a close connection with the scheme which has added the picturesque group of buildings next the Castle, and known as the University Hall, being a collection of boarding houses specially designed for providing a better social life for the student than many can have in separate lodgings. If anyone desires to see a quaint reproduction of a Medieval court, he will find it in the quadrangle inclosed by the buildings alluded to. There does



FIG. 5.

experienced. In 1892 the present building was erected to meet the advanced demands of the times, and in Figs. 5 and 6 we find the ground and first-floor plans of Messrs. Wyllson and Long's reconstructed hall. The Oxford, as a hall, is distinct in character from the palace of



FIG. 6.

variety type. Standing out in London with marked success, it is admirably adapted for the purpose for which it was built.

As a place of assembly the music-hall is as im-



not seem to be room for much further improvement of the elevations towards Princes-street now that a new building for the Free Church Offices has been completed. This shows a Flemish gable on the east, with a single French window on the west—not a very happy combination; but the frontage is relieved by oriel windows. One of the worst of the old closes has disappeared, known as Lady Stairs. In one of the old buildings left standing, an old hall which had been altered for greater floor-space and more apartments on the floors, has been found, and, it is said, will be restored by Lord Rosebery as a peculiar feature of Old Edinburgh. The large building known long as the home of Short's Observatory in Castle Hill is being altered to provide further accommodation for the University Hall, so that from the Castle to Bank-street, which space comprises the Free Church buildings, the old slums are pretty well improved away, and ladies and gentlemen are back again, as well as respectable citizens of the working class. The demand for smaller houses is still very great, and much is being done to meet it. The only regrettable feature is the circumstance that the two-roomed house is still, in far too many cases, occupied by families which would require at least another room.

The public have recently been apprised of what some do not hesitate to call the extravagant administration of the School Board of the city. It is affirmed that the cost of teaching the elements to the young costs between £1 and £5 a head, whereas in other large towns the cost is nothing like it. Certainly very large and expensive schools have been building year by year, and a new one for about 800 children is to be begun in Preston-street.

The extravagance is probably occasioned by the endeavour to undertake too much of what is properly not elementary, but secondary, instruction, and some limit should be put to schemes which admit of indefinite expansion. The elements of gymnastics, swimming, chemistry, joinery, &c., should be paid for.

## THE TIMBERS OF AUSTRALASIA.—X

THE HARDWOODS (concluded): VII.—WOOD-PAVING.

HAVING now dealt *seriatim* with the hardwoods of all the six Australian colonies, it remains for me to offer a few observations on one of the most important uses to which these hardwoods have been put during the last few years—namely, their employment for the purpose of street-paving.

It is certainly beyond dispute that for some time past the superb condition of the wood-paved streets of Sydney—streets with a surface perpetually as smooth almost as a billiard-table, in spite of the exceptionally heavy traffic they have to carry—has attracted the attention of intelligent and observant travellers from various parts of the world, who have been by no means slow in expressing their unqualified admiration of roadways which so markedly enhance the appearance of the city, so greatly facilitate and lessen the danger of its traffic, and promote so distinctly its cleanliness and health. Accordingly, I propose firstly to specify and explain as concisely as possible the several materials and processes now employed in wood-paving the roadways of the Sydney streets, and then to briefly analyse the advantages possessed by this hardwood-paving over any other.

**Materials.**—It will have been gathered from the preceding articles that a considerable number of the Australian hardwoods are suitable for wood-paving. Many of them, however, are still in what may be termed the tentative or controversial, or even the suggestive, stage. As the use of wood-paving develops and increases in various parts of the world, some—perhaps most—of these timbers will receive the hall-mark and imprimatur of actual and carefully recorded experience; but at the present time, and for the purpose of these articles, it will be best to mention those only whose value for this purpose has been proved beyond the possibility of question. The woods, then, employed in Sydney are now almost exclusively blackbutt (*Eucalyptus pilularis*) and tallow-wood (*E. microcorys*), which experience has shown to be the very best of all paving timbers, though scarcely inferior are the forest mahogany (*E. resinifera*) and turpentine (*Syncaesia laurifolia*). In Melbourne (whose street pavements rank next to those of Sydney) the timbers most largely used are the Murray and forest red gums (*E. rosstrata* and *tereticornis*) and the Victorian blue gum

(*E. globulus*); while in other cities the West Australian jarrah (*E. marginata*) is deservedly esteemed. The wear in Sydney of the four above-mentioned kinds of New South Wales hardwood blocks, under a daily traffic of 900 tons to a yard width of road, is as follows:—Blackbutt,  $\frac{1}{2}$  in. per annum; tallow-wood,  $\frac{1}{2}$  in. per annum; forest mahogany,  $\frac{1}{2}$  in. per annum; turpentine,  $\frac{1}{2}$  in. per annum, as against the wear of softwoods, under similar conditions, of about  $\frac{1}{2}$  in. per annum, or (in the case of blackbutt, which is altogether the finest paving-timber known) thirteen times less. The blocks are all required to be thoroughly sound, well-grown timber, to be cut from the heart of the tree, and to be well-seasoned and free from sap.

**Preparation of the Roadway.**—In order to produce a satisfactory wood-pavement it is necessary that all the incidental operations should be conducted with the strictest (indeed, almost mathematical) regularity and accuracy. An even, smooth, and properly convex bed to receive the blocks is a *sine quâ non*, to obtain which the roadway is excavated to the depth of 12 in. or 13 in. below the intended finished level, which is 6 in. below the top of the kerb of the footway. This is filled in to a depth of not less than 6 in. with solid cement concrete\*, finished to the required convexity (which in Australia has to be considerable in order to cope with the frequent violence of the rainfall, and in most of the Sydney streets averages 1 in 60). This, after standing from 12 to 24 hours, is rendered to within 6 in. of the road level with a thin floating of fine stuff consisting of two parts of clean sharp sand to one part of best Portland cement, which is given not less than seven days to set, the surface being meanwhile kept moist and protected from the sun's heat by damp sand or bags spread over it. When this work is completed and approved, the bed is ready for the paving itself.

**Laying the Wood-Blocks.**—In the early days of wood-paving in Sydney (which has now been practised for the last 16 years) the blocks were laid with, of course, the ends butting close, but with an inch space (subsequently reduced to  $\frac{1}{2}$  in. and  $\frac{1}{4}$  in.) between the rows, the interstices being filled partly with bituminous matter and partly with gravel grouting. It was found, however, that under this system the effect of the traffic was to disintegrate and sweep away the grouting, thereby corrugating the surface of the blocks, and likewise to bevel off their consequently unprotected arrises, thereby preventing the wood from wearing evenly and fairly. The system proved the cause of deafening noise and incessant jarring in the traffic, great difficulty of cleaning the roadways, and considerable wear-and-tear of both vehicles and horseflesh (to say nothing of human nerves), besides actual decay in the wood-blocks themselves.† Thanks, however, to the city surveyor of Sydney, Mr. R. W. Richards, A.M.I.C.E., the rows have for some years past been laid with close or butt joints, whereby the inconveniences formerly experienced have been entirely obviated, and accordingly the pavements laid upon the old and open-joint system have been, or are being, all gradually taken up, and relaid with butt joints. The mode of laying now practised, which seems to be as perfect as anything can well be, is as follows:—The blocks (which should always be of one description of timber only for a given space of, say, at least one chain of paving) are accurately squared to a uniform size of 9 in. by 6 in. by 3 in., the 6 in. dimension being the depth.‡ The blocks being

conveniently stacked on delivery about four hours before they are required for use, they are bathed in boiling tar by being made to travel along a curved iron plate which dips beneath the surface of the heated liquid in the cauldron. When the tar has sufficiently set, the blocks are passed on to within reach of the layers, who place them in transverse rows across the roadway, taking care to counterchange the joints (which are tightened from time to time by leverage with a crowbar), and firstly laying three rows of blocks longitudinally next the kerbing. Prior to this, however, a 2 in. wooden batten is laid along the kerb, against which to place these rows of blocks. When the blocking is completed this is removed, and the space it occupied is filled in with puddled clay. This layer of clay forms an "expansive joint," which is necessary to allow for the slight swelling of the wood blocks through the action of protracted heavy rain and sudden climatic changes, though the exceedingly close texture of the wood, aided by the coating of tar, renders the substance of the timber so little pervious to, or absorbent of, moisture that actually the expansion has been found to be almost infinitesimal. Still, in order to guard against the possible displacement of the kerb and flagging of the footway from such a cause, not only is the middle joint introduced, but for some years past the Sydney Municipal Council have increased the depth of the stone kerbing from 12 in. to 18 in., so that whatever lateral pressure the stratum of blocks may exercise is exerted on the middle third of the kerb. Thus all leverage is avoided, and the only thing for which the pressure can "be bad" (as Stephenson said of the "coo") must, therefore, be the clay. Every twelfth row of blocks is hammered up close as the layers proceed with their work, a plank 12 ft. long, 6 in. deep, and 2 in. thick being used as a beating surface. Upon the completion of a length of one chain, the surface is covered with a mixture of tar and pitch spread on hot, and to this a finishing touch is given with a top-dressing of pea-gravel and sand, which, binding on to the blocks, forms a rough surface for the time, and, as it wears away, still roughens the wood sufficiently to avoid all slipperiness, and afford a foothold to the horses.

**Diagonal Paving for Intersections of Streets.**—When first the Sydney roadways were wood-paved, it was customary to lay blue-stone cube setts on a bed of sand spread over a foundation of concrete at the intersections of streets. But after a few years' wear it was found necessary, for the sake of the traffic, to remove the setts and pave with wood-blocks. A careful examination of the setts removed showed an average wear of  $\frac{1}{2}$  in. per annum—in most cases they had been down at least five years—while wood-blocks removed from different parts of the city showed a wear varying only from  $\frac{1}{8}$  in. to as little as  $\frac{1}{16}$  in. per annum. For some time past it has been the practice to lay the blocks at intersections diagonally, instead of transversely, across the roadway, at an angle varying from 30° to 45° to the kerb, but otherwise in precisely the same manner as usual. The blocks nearest the rows along the kerb, or wherever else they may be required, are neatly sawn (not split) so as to mitre closely at the angles, and at all such places of meeting the faces of the blocks are thoroughly tarred. The difficulty attending intersections has been thus completely and satisfactorily solved, while the diagonal mode of laying seems to reduce still further the wear of blocks and the small amount of noise that still remains under the butt-joint system. The two modes of laying will be made perfectly clear by the plans and section given in the diagram on page 889 ante.

**The Mastic Joint for Cable Tramways.**—The introduction of the cable tramway into some of the principal Sydney streets necessitated provision in those thoroughfares, in addition to that afforded by the "expansion joint" next the kerb, for the expansion of the block near to the tram-rails, without its closing the slot for the cable gripper. This has been effected by what is called a "mastic joint," which consists of a channel about an inch in width, formed lengthwise across a row of blocks, and filled with a soft material made from the refuse of soap works. Several of these mastic joints are placed at intervals along the road, and appear to answer their purpose completely. The arrangement is shown in diagram kindly furnished me by the Federal Timber Company, which carried out the work.

DE LIBRA.

\* Six inches is the regulation depth of concrete for the Sydney streets, which have mostly a foundation of living rock. But outside the city, wherever the roadway passes over made or uncertain ground, it is the practice of the (Government) Roads and Bridges Department to put in 9 in. of concrete.—D. L.

† This decay results from the action of the cement when in prolonged contact with the wood; and it, therefore, seems strange that, according to a paper read before the Society of Arts in London, by Mr. L. H. Isaacs, F.R.I.B.A., on the 15th December, 1893, the practice of filling in the  $\frac{1}{2}$  in. joints with cement should so recently be still practised in England. Long before that time it was found in Sydney that the blocks jointed with cement grouting suffered from dry rot, and many of those in the wide expanse of pavement at Circular Quay were almost in a state of collapse. The decomposition was described by Mr. W. H. Hamlet, Government analyst of New South Wales, as hydrolysis of cellulose, brought about by contact of the wood with the alkaline substances of the cement. In Gwilt's "Encyclopædia of Architecture" the chemical action setting in between cement and timber is attributed to the oxygen in the cement combining with the carbon of the wood to form carbonic acid gas.—D. L.

‡ The longest regulation dimension is 9 in.; but for convenience in fitting, some of the blocks are sized shorter, usually 7 in. or 8 in.—D. L.



## CONTENTS.

What the Public Expect .....	319
Corners and Crooked Plots .....	320
Remuneration for Preliminary Designs .....	321
Factory Construction and Factory Acts.—IV. ....	322
Warning Buildings by Hot Water.—II. ....	324
Some Minor Examples of the French Renaissance .....	325
Construction of Steel Spires and Steeples.—I. ....	326
The Congress of French Architects. ....	327
Stencilled Fabrics and Wall-Hangings .....	327
Concert-Halls and Assembly-Rooms.—XXI. ....	328
Notes from Edinburgh .....	329
The Timbers of Australasia.—X. ....	330
The BUILDING NEWS Directory .....	IX.
Our Illustrations .....	331
Building Intelligence .....	350
Architectural and Archaeological Societies .....	350
Parliamentary Notes .....	350
Cast-Iron in Builder's and Contractor's Work.—	
XXVIII. ....	351
A Lofly Steel Building. ....	352
Competitions .....	352
Correspondence .....	352
Intercommunication .....	353
Legal .....	353
Legal Intelligence .....	353
Water Supply and Sanitary Matters .....	354
Our Office Table .....	354
Trade News .....	356
Tenders .....	356

## ILLUSTRATIONS.

OLD CHAPEL, ILE ST. HONORAT.—BOARD SCHOOLS, LLANRWST.—ADDITIONS TO ST. ANNE'S CHURCH, WANDSWORTH.—HOUSE AT KNUITSFORD.—CO-OPERATIVE STORES, NEWTON HEATH, MANCHESTER.—LOUIS XV. AND LOUIS XVI. FURNITURE.

## Our Illustrations.

## OLD CHAPEL, ILE ST. HONORAT.

We are indebted to Mr. J. C. Warburg for this fine view of this interesting example of historic French architecture. Writing from Cannes, Mr. Warburg says:—"Many thanks for the copies of my photo., which have turned out excellently well. The photograph represents the chapel in the ruined castle of St. Honorat, one of the Iles du Lierius. The castle was built in the 11th century by the monks of the island as a refuge from pirates. The monastery itself existed already in the 5th century. The chapel is the best-preserved part of the castle; it is open to the sky in the middle, and a row of pillars of different materials and various ornamentation supported the second story, also a chapel. The building contained over 80 rooms. St. Patrick of Ireland was at one time a monk on St. Honorat." We published some sketches and plans of the castle, by Mr. David McGibbon, in the "B. N." for Dec. 14, 1888, where some further particulars of these and other remains in Provence and the Riviera will be found.

## BOARD SCHOOLS AND MASTER'S HOME, LLANRWST, NORTH WALES.

The illustration shows the group of buildings now in course of erection for the Llanrwst School Board. They stand immediately adjoining the main road, and will form an interesting feature in the popular coaching drive from Llandudno to Bettys-y-Coed. The exterior is of Penmaenmawr and Andover coursed level-bedded walling, the dressings being Cefn freestone, and the roofs covered with 16 by 8 Festiniog slates. During the progress of the work the school board decided upon having, and are now building at the north-west corner of the main block, a clock-turret. The contractors are Messrs. D. Williams and Son, Carnarvon, the architects being Messrs. Grierson and Bellis, of Bangor, North Wales.

## ST. ANNE'S CHURCH, WANDSWORTH.

The additions to the east end of this church are now being carried out by Messrs. W. Johnson and Co., of Belle Vue-road, Wandsworth Common, whose tender amounted to about £2,500. The new buildings comprise chancel, with semicircular apse, having on the south side a morning chapel, with organ chamber over, and on the north side vestries for the clergy and choir respectively. Externally the walls are faced with a light primrose-coloured brick. The roofs will be covered with Broseley tiles of a deep brown colour. Internally the chancel is vaulted in plaster, and will have a floor and steps of marble. The large sculptured panel in the head of the reredos has been modelled by Mr. Broad, a resident in the parish, and is now on view in the sculpture room

at the Academy. The original church was designed by Sir Robert Smirke, R.A., and opened in 1824. It has a gallery on three sides, but no chancel. Seats for 200 additional hearers are obtained by the extension, the choir having previously been placed in the nave. The pulpit and choir-stalls have been in the old church for some few years past. They were made by Messrs. Farmer and Brindley from designs of the architect, Mr. E. W. Mountford, F.R.I.B.A., who is also carrying out the present work. The foreman of the works is Mr. T. Gilchrist.

## HOUSE AT KNUITSFORD.

This house is now being built. The brickwork is faced with hand-made red bricks 2½ in. wide; the half-timber work is finished with an adzed surface, and the roof covered with stone flags. The staircase, doors, panelling, and other internal fittings are of old oak. The drawing-room and most of the bedrooms are finished with white enamelled woodwork. The principal feature in the plan is the hall, which is carried up through two stories, and which has a wide ingie with panelled seats and brick hearth, and on the south side a music gallery which is approached by a small staircase opening off the jamb of the drawing-room window seat. There are five bedrooms on the first floor, with bathroom and w.c., and on the attic floor a study, servants' bedrooms, and box-rooms. The stable is placed at right angles to the house, and comprises two stalls and loose box, harness-room, coal-house, and wash-house, with loft and accommodation for a man over. The contractors for the work are Messrs. J. and J. Beswick, of Knutsford, and the architects Messrs. M. H. Baillie Scott and H. Seton Morris.

## BRANCH STORES AT NEWTON HEATH, MANCHESTER, FOR FAIRFORTH INDUSTRIAL SOCIETY, LTD.

This block of branch shops is being erected on a most commanding site in Oldham-road, Manchester. The buildings have a frontage to Oldham-road of 120ft., and to Church-street and Green-street of 65ft. respectively, with a private street at the back where all the loading is done. The scheme comprises commodious shops for grocery, tailoring, drapery, and boot and shoe department, with extensive showrooms on first floor and workrooms above. A clock tower is provided at the corner of Church-street. The buildings are fireproof throughout, the basement being lined with white glazed bricks. The outside facings are of red Ruabon bricks with Yorkshire stone dressings. The fittings are of a most complete character, all adapted for the very large business done by the Society. The tailor's shop is finished in polished baywood, the other shops in pitch pine. The total cost will be £14,000. Mr. Jonathan Partington, of Chadderton, is the contractor, and the architect is Mr. Fred. W. Dixon, of Manchester and Oldham.

## EXHIBITION FURNITURE OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES AT BETHNAL GREEN MUSEUM.

This loan exhibition, now open to the public, occupies the galleries recently left vacant by the removal of the national portraits to their permanent home in the new building at the rear of the National Gallery. Of course, South Kensington sends many of its fine examples of old English work, and H.M. the Queen, the Hon. Massey-Mainwaring, Sir Spencer Ponsonby-Fane, K.C.B., Mr. W. H. Spottiswoode, and many of the City Companies, as well as the India Office, contribute to the large collection, numbering some hundreds of exhibits. Amongst the objects of early date we may mention the great Elizabethan bedstead, carved with the Courtenay arms, and dated 1593. It comes from South Kensington, where it stands in the beautiful but very dark panelled room from Sizergh Castle (illustrated in the "B. N." April 24, 1891). Here at Bethnal Green it can be studied in the light of day. Then there is the beautiful harpsichord from Knoke. The Carpenters' Company send their well-known armchair and octagon table, of which we gave sketches in the "B. N.," June 23, 1893. The fine inlaid oak table, said to have belonged to the Company's barge, is contributed by the Brewers' Company, who also lend the Masters' chair from their court-room. These two exhibits we have also illustrated (see "B. N.," May 17, 1895). The Master's chair belonging to the Parish Clerks' Company, an illustration of which appears on our sheet of sketches to-day, is an object of great interest. For its size, it is remarkably light. Here the back and seat

are of cane, and the woodwork is by no means heavy. The wooden mantling which crowns the back contains the arms of the Company, while the open carved book at the top comprises the music of one of the Psalms, the date 1716 being cut in the back of the mantling. The height of the seat is somewhat unusual, being 2ft. from the ground, while the turning is well worth attention. The other objects on our sheet of sketches are the late Jacobean chair and the William and Mary chest of drawers, lent by the Hon. Sir Spencer Ponsonby-Fane, K.C.B. The former is a very fine and uncommon specimen, with open-wood back. The curved stretchers to the legs add not a little to the picturesque character of the chair. The chest is a good specimen of ingenuity in obtaining a varied effect by simple means. The panelling is well designed and suggestive. The slender chair lent by Mr. Stuart M. Samuel is attributed to the Jacobean period. Whatever its precise date, it is an elegant seat, its one element of weakness being the want of support between the leather seat and shoulder-piece, which would considerably mar its comfort. The richly-carved armchair lent by Mr. Tho. Wardle, of Leek, is quaint and unusual, and we therefore add a sketch of it to our sheet. Amongst the Chippendale work we noticed the Masters' chair from the business room of the Stationers' Hall, of which we gave a sketch on June 28, 1895. Also that beautiful specimen of 18th-century workmanship—a satinwood dressing-table—with painted decorations, which we illustrated Aug. 5, 1892. Specimens of Chippendale, Strawberry-hill Gothic, Hepplewhite, and the Brothers Adam, and the Later Georgian are also here in variety, and can be studied side by side.

## LOUIS XV. AND LOUIS XVI. FURNITURE, FROM THE GOLDSMID COLLECTION.

We herewith give sketches of some of the principal pieces contained in the collection of the late Sir Julian Goldsmid, Bart., the recent disposal of which at the sale-rooms of Messrs. Christie, Manson, and Woods realised over £100,000. Of this total sum nearly £70,000 were bid for the pictures alone. Of the five pieces shown in our sheet of illustrations, the Louis XV. Secrétaire at the bottom of the page, undoubtedly bears the palm for elegance and beauty of workmanship. Small wonder, therefore, that such a piece, when genuine, of the period named, should find a purchaser even at 650gs. As will be seen, the desk portion is inclosed with a revolving cylindrical front, richly inlaid with a wavy design in light wood. The back and sides are inlaid with trophies of musical instruments, and the drawers with floral sprays. It is just over 5ft. wide, and has ormolu handles and mounts. The upright Secrétaire of Louis XVI. period, to the right, is also very richly inlaid in coloured woods, with a white marble top. The upper portion opens with a fall-down front, with folding doors below. The width is 3ft. 2in., and it was sold for 145gs. The Louis XVI. parqueterie Commode (4ft. 7in. wide) realised the high price of 270gs., and is a good example of the period indicated, while the sumptuous little Secrétaire with sloping fall-down front, mounted with ormolu borders and scroll foliage, and a monkey in a swing held by children, sold for 240gs. It is 3ft. 2in. wide, and is surmounted by a clock in ormolu case held by a kneeling figure of Cupid. The little Bonheur-du-Jour table, only 2ft. wide, fetched 92gs. Thus the total sum realised by the five pieces that appear on this sheet of sketches was about £1,465.

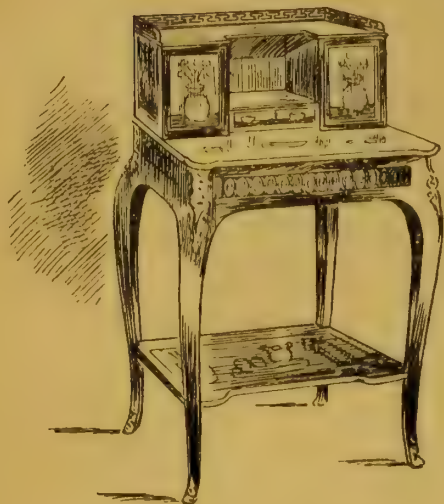
Cardinal Vaughan will open the new Catholic church in Alexandra-park, Manchester, on Sunday, July 5. The architect is Mr. F. H. Oldham, of Manchester.

Many members of the theatrical profession attended an interesting ceremony yesterday afternoon at the Shakespeare Theatre, Lavender Hill, Battersea, which is now in process of completion. The theatre, of which Messrs Machin and Bennett are the proprietors, is a commodious building of red brick with Bath stone dressings. It has a frontage of over 100ft., and is calculated to accommodate some 3,000 people.

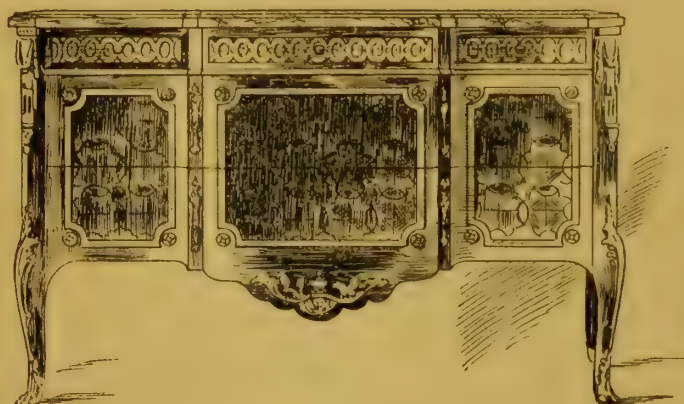
The first annual dinner of the Peterborough Master Builders' Association was held at the Angel Hotel on Tuesday week. Alderman Nichols, J.P., presided, and Councillor Clifton occupied the vice-chair. Mr. W. Hicks proposed "The Architects of Peterborough." Mr. Boyer and Mr. Stallebrass responded. Mr. Bodger submitted "The Master Builders' Association," stating that it supplied a long-felt want in the city. Mr. Jellings responded.



LOUIS XV. BONHEUR-DU-JOUR  
TABLE.  
SOLD FOR 92 Gs.

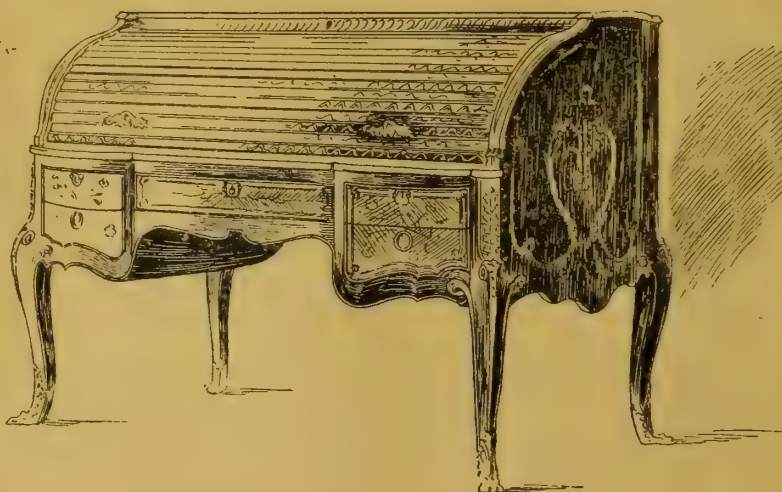


LOUIS XV. PARQUETERIE SECRETAIRE.  
SOLD FOR 240 Gs.

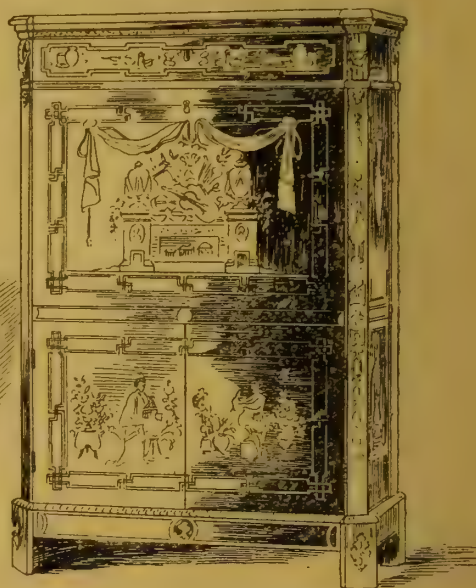


FURNITURE OF  
LOUIS XV. & LOUIS XVI. PERIODS.  
FROM THE COLLECTION OF THE LATE  
THE RIGHT HON.  
SIR JULIAN GOLDSMID BART M.P.

LOUIS XVI. PARQUETERIE COMMUNE.  
SOLD FOR 270 Gs.



LOUIS XV. MARQUETERIE SECRETAIRE.  
SOLD FOR 650 Gs.



LOUIS XVI. UPRIGHT  
MARQUETERIE SECRETAIRE.  
SOLD FOR 145 Gs.

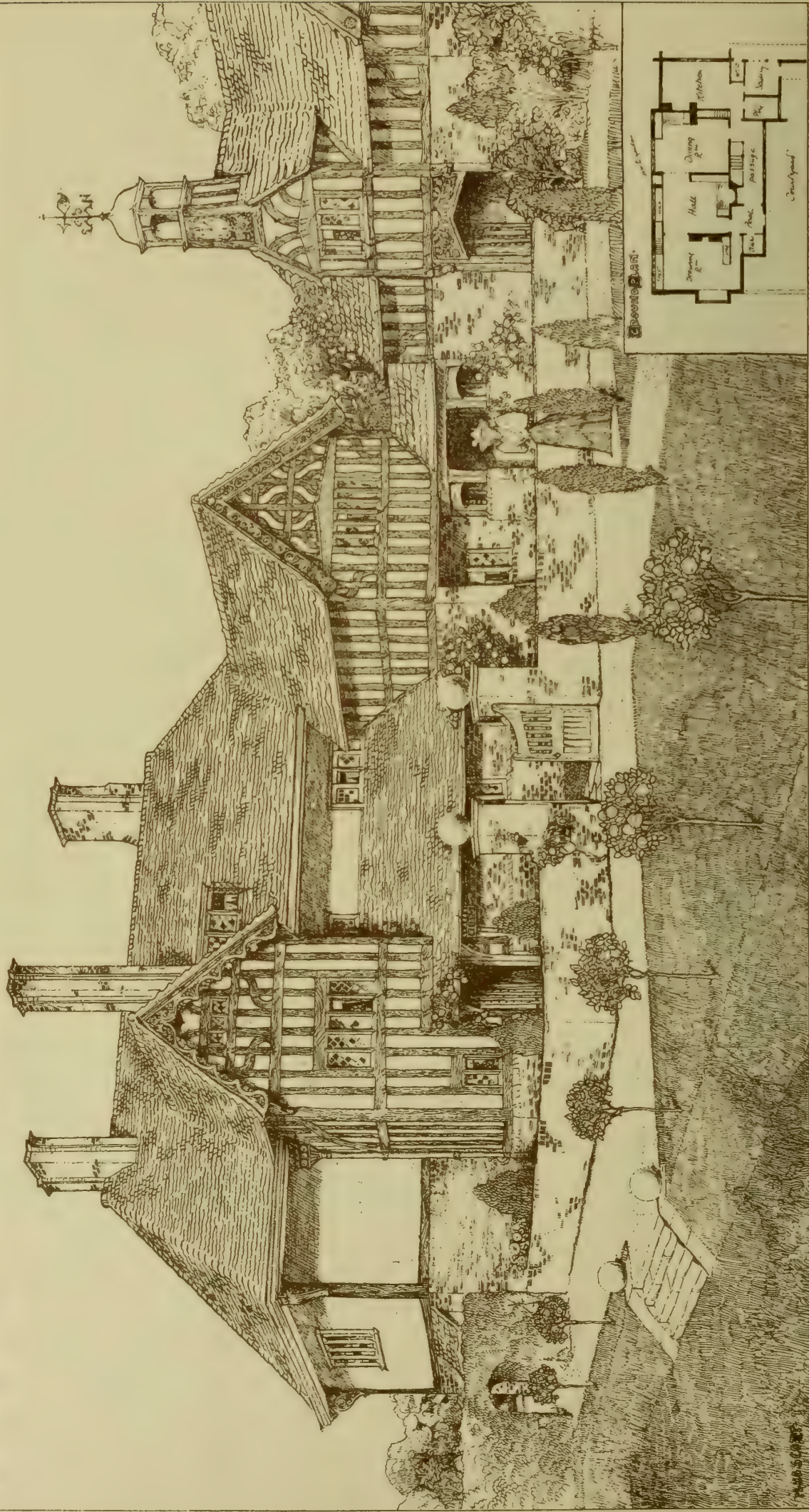






PROPOSED HOUSE AT KNOTSFORD FOR D. D. MACPHERSON, ESQ.

MESSES BAILLIE SCOTT & SETON MORRIS ARCHTS













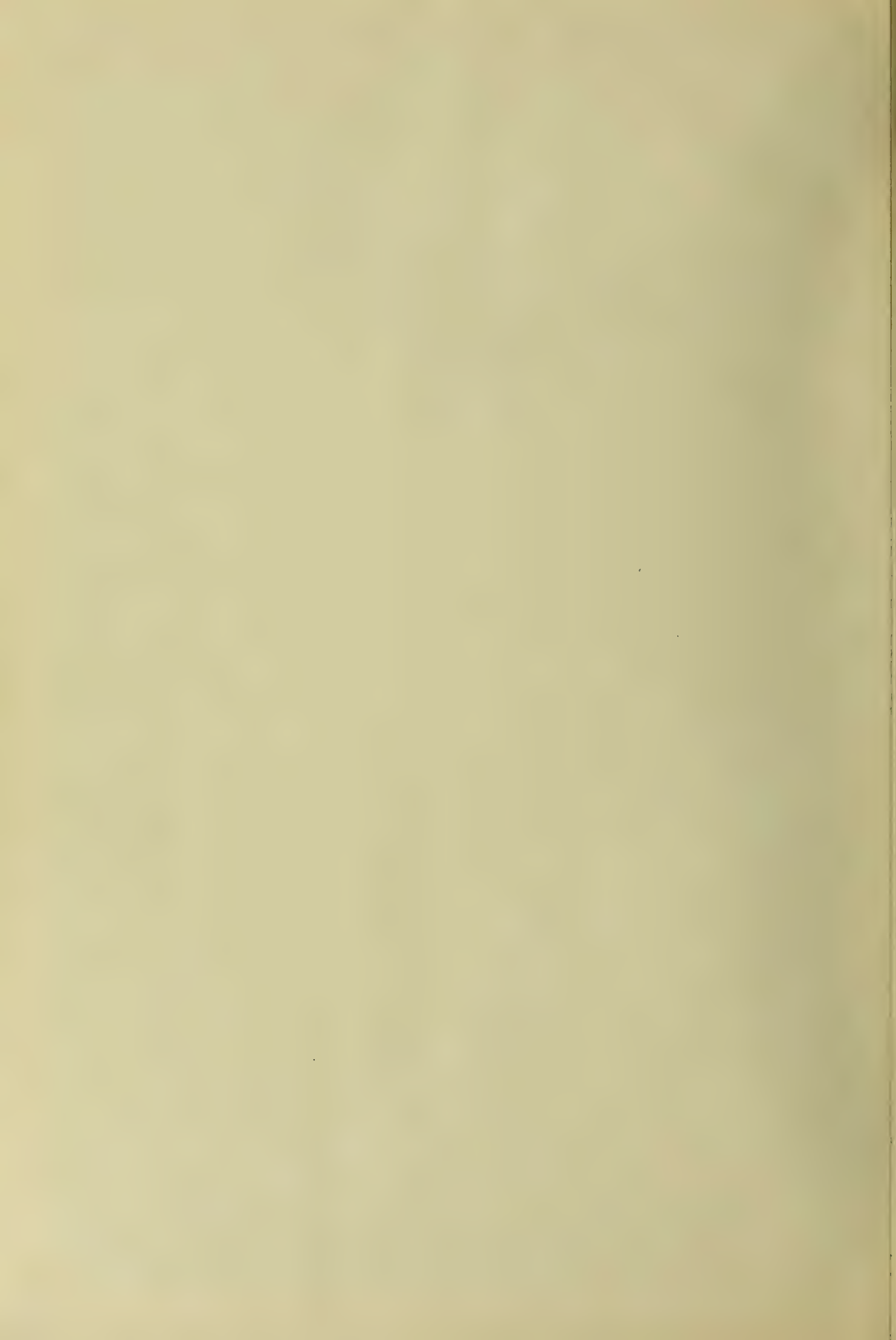
JUNE 26. 1896.



"PHOTO-TINT" by James Akersman. Queen's Square London W.C.

WANDSWORTH E.W. MOUNTFORD FRIBA ARCHT



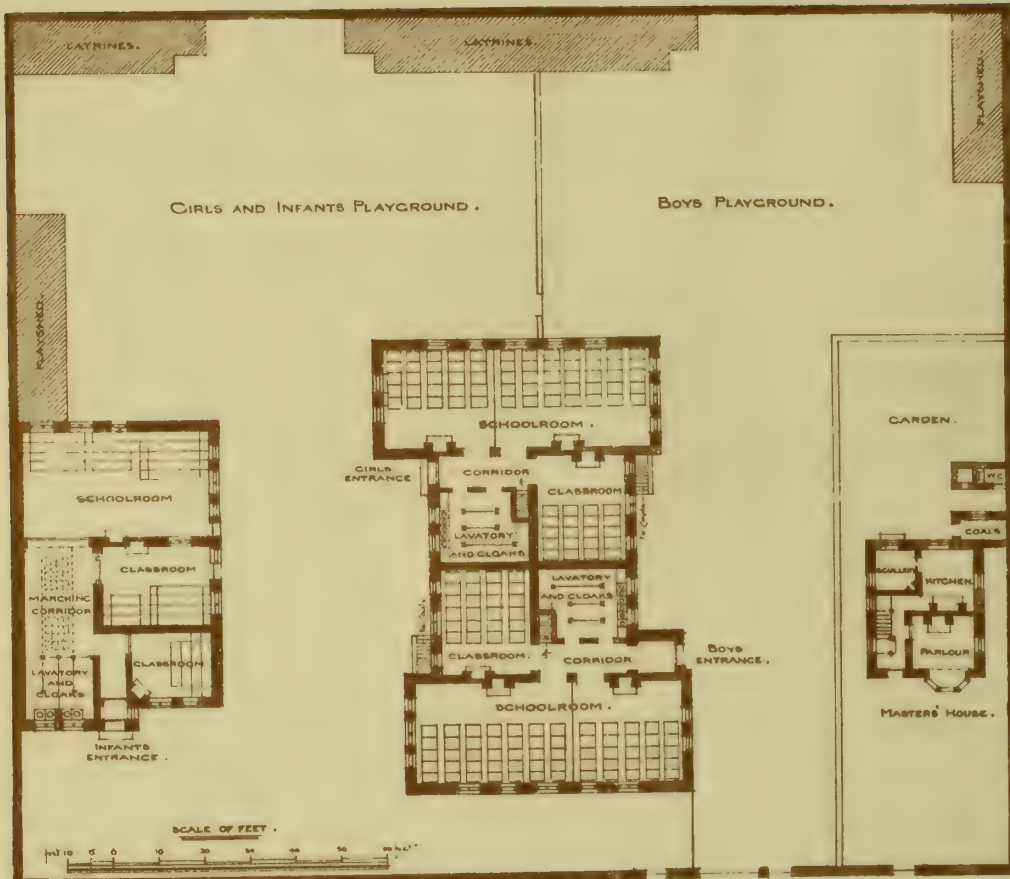








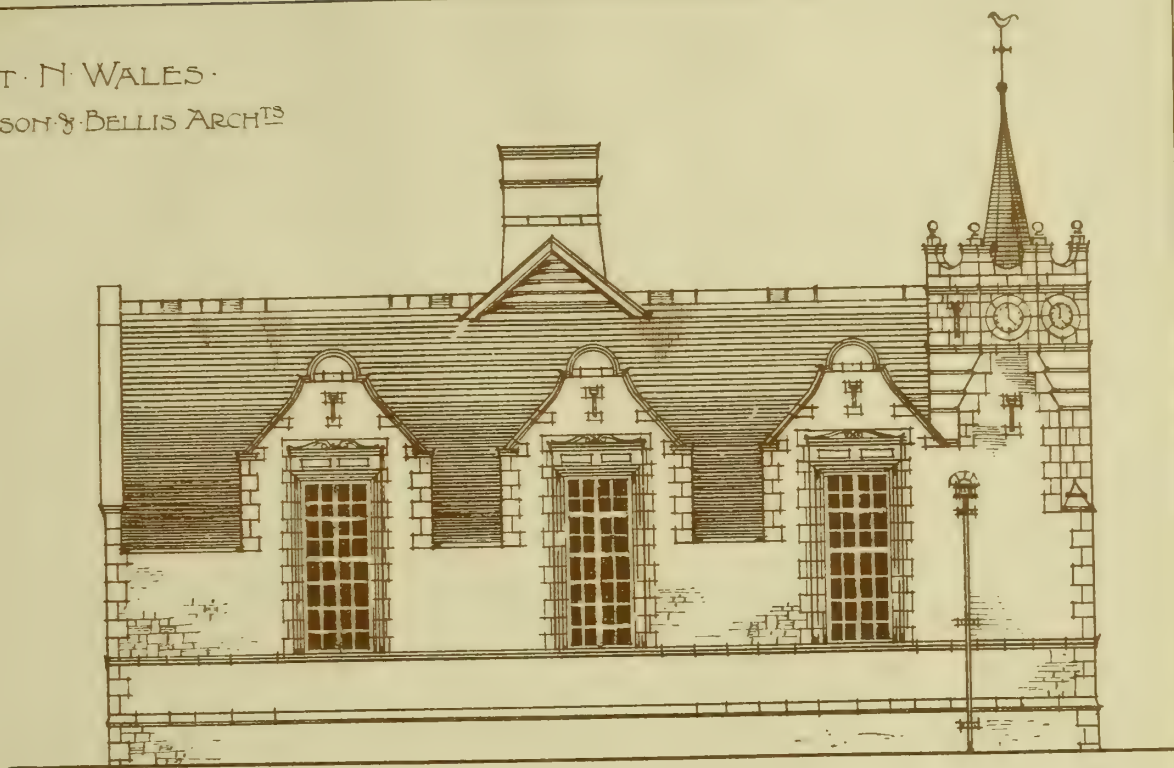
BOARD SCHOOL





JUNE 26 1896.

LANRWST. N. WALES.  
MESSRS GRIERSON & BELLIS ARCHTS



"PHOTO-TINT" by James Akerman. 6 Queen Square London W.













OLD · CHAPEL · ILE · ST HONORÉ



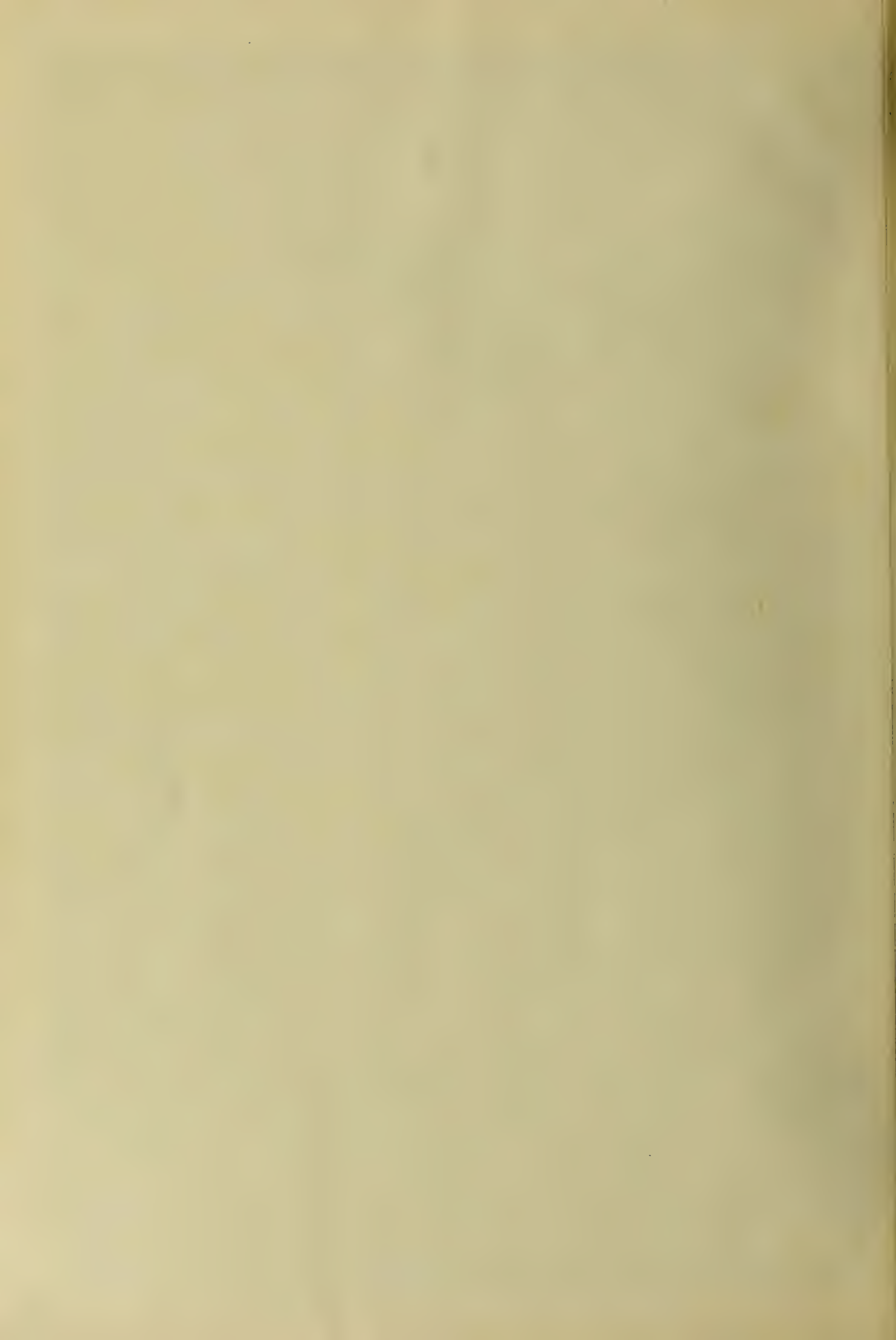
JUNE 26. 1896.



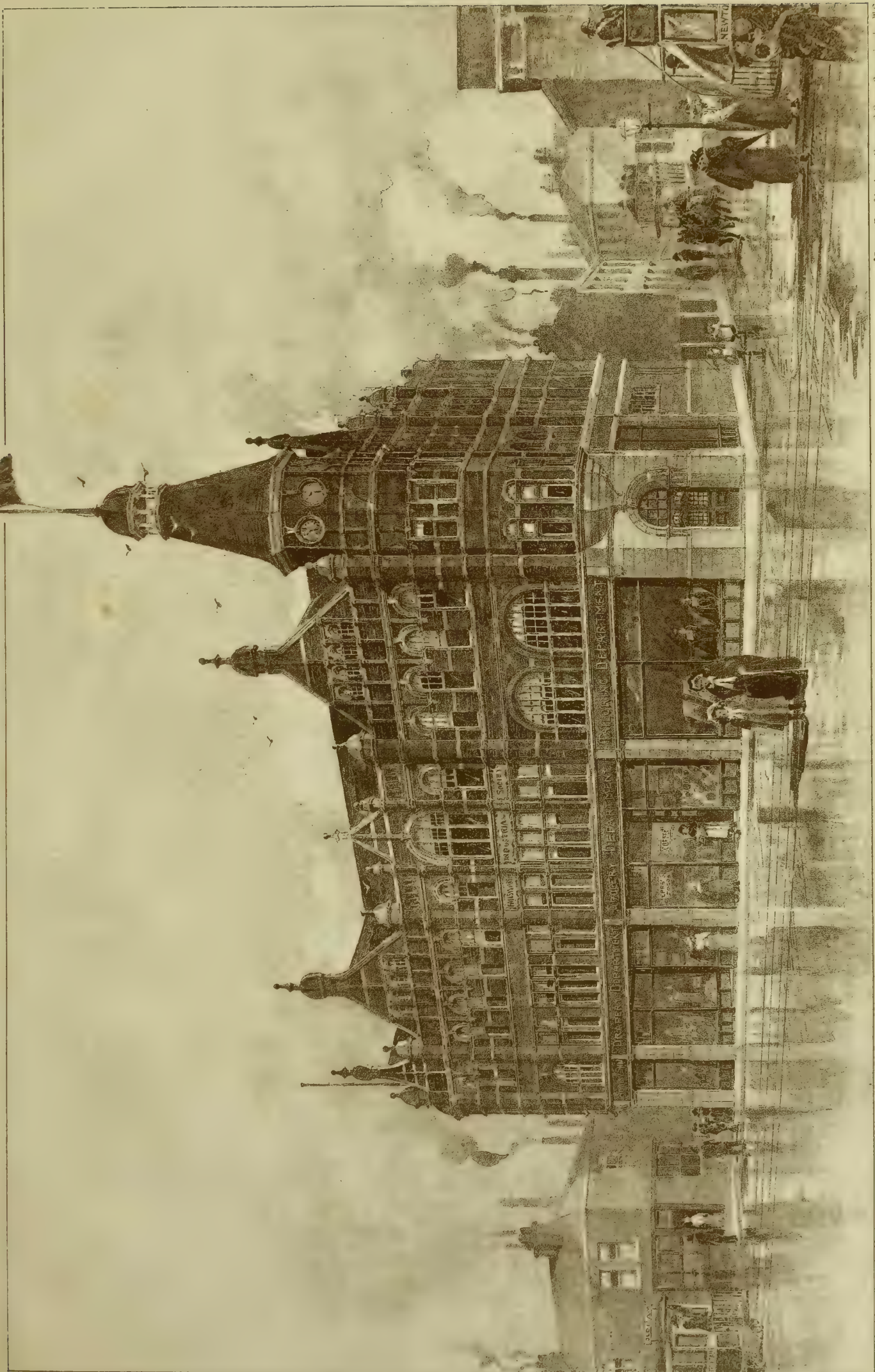
"PHOTO-TINT" by James Akerman. 6 Queen Square London W.C.

FROM A PHOTO BY J. C. WARBURG.









"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

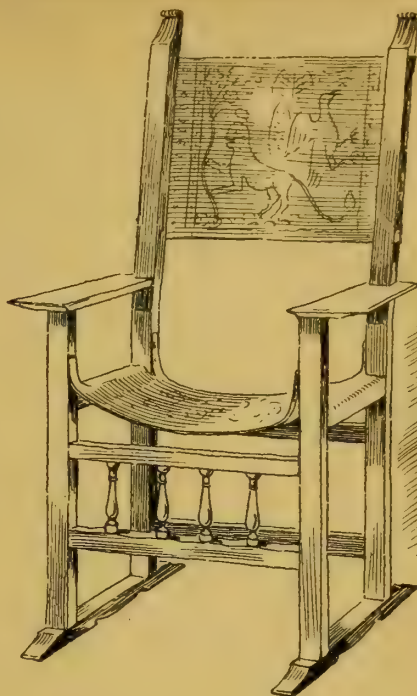
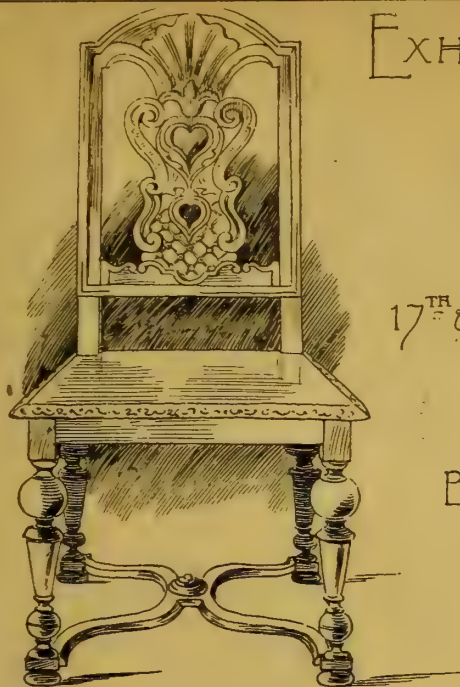
CO-OPERATIVE STORES · NEWTON HEATH · MANCHESTER      F.W. DIXON · ARCHT.



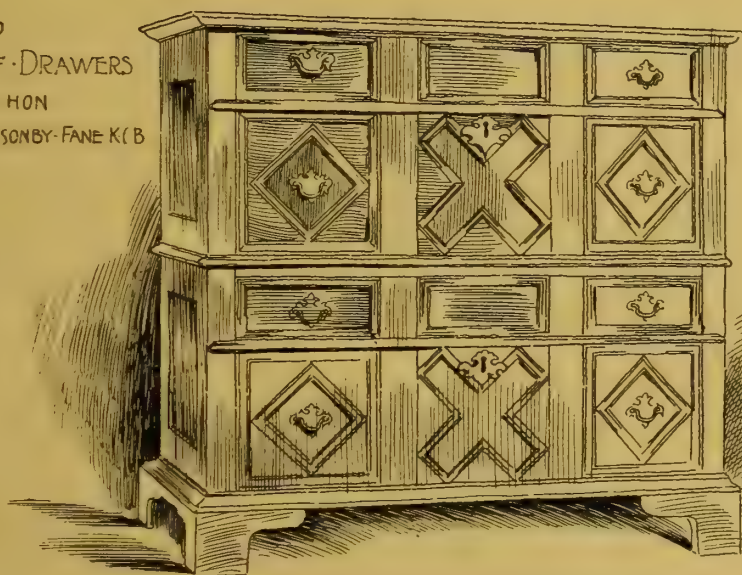




EXHIBITION  
OF  
FURNITURE  
OF THE  
17<sup>TH</sup> & 18<sup>TH</sup> CENTURIES.  
AT THE  
BETHNAL GREEN  
MUSEUM.

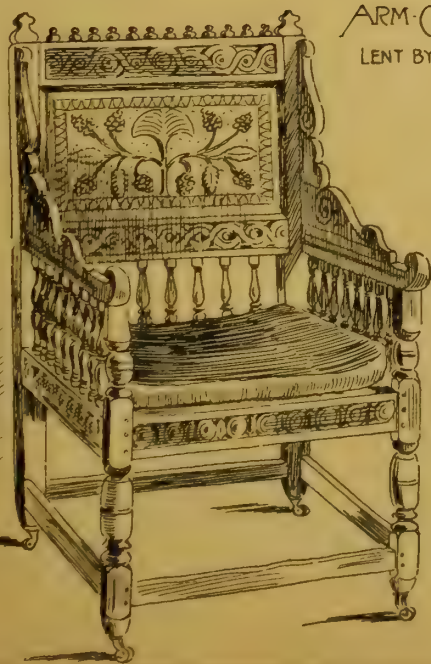


CHAIR AND  
CHEST OF DRAWERS  
LENT BY THE HON  
SIR SPENCER PONSONBY-FANE KCB

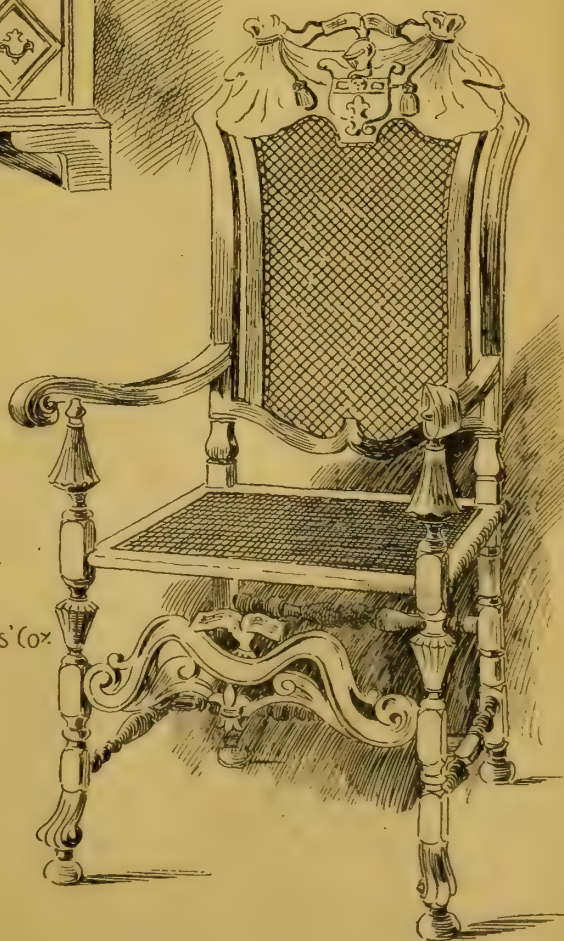


CHAIR WITH LEATHER SEAT & BACK  
LENT BY STUART M. SAMUEL ESQ

ARM CHAIR  
LENT BY THOS WARDLE ESQ.



MASTER'S CHAIR  
LENT BY THE  
PARISH CLERKS' COY





## Building Intelligence.

**EDINBURGH.**—The Union Club, Hanover-street, was opened last week. The public rooms, all of which are decorated and finished, consist of, on the street floor, a large dining-room to the front, with a luncheon room capable of accommodating about a hundred people at a time, and a smoking-room behind, and a reading-room, card-room, and billiard-room, with three tables, on the first floor. There are also committee and secretary's rooms, eleven bedrooms for the use of members, and accommodation for a staff of thirty-five servants. The architects were Messrs. Dunn and Findlay. The structural alterations have cost somewhere about £4,500, and about £4,000 has been expended on the furnishings.

**HANLEY.**—Cauldon-road School, Hanley, was formally opened last Friday. It has been built adjoining the one erected in 1891, and is a mixed school, planned on the central hall system, with classrooms grouped around it. The central hall is 68ft. by 35ft., and there are two classrooms, each for 70 children, and seven for 60 children each, thus giving a total accommodation, including a class of 60 in the central hall, for 620 children. There are spacious cloakrooms and entrances, with large teachers' rooms and storerooms over. The architect is Mr. E. E. Scrivener, the architect to the Board, and the builder is Mr. G. Ellis, of Hanley, whose contract for the buildings, including boundary walling, ashing playgrounds, &c., was £3,680, or £5 18s. 8½d. per head.

**KING'S HEATH.**—The foundation-stone of a large church, which the Wesleyans of King's Heath and of the Moseley-road circuit intend erecting at the junction of the School, Cambridge, Poplar, Valentine, and Springfield-roads, King's Heath, was laid on Tuesday afternoon. The church is to be erected from designs by Mr. W. Hale, and will be in the Early English Gothic style of architecture, with spire 115ft. high, and will seat 620 persons. The present school-chapel will be used as school premises. The whole will cost about £4,000.

**NOTTINGHAM.**—The new Victoria Baths, which have been erected at Sneinton by the Nottingham Corporation, were opened last week. The old structure, with the exception by the first-class swimming bath, has been pulled down, and the building erected from designs by the borough engineer, Mr. Arthur Brown, M.I.C.E. The building fronts Gedling-street, and there are separate entrances for both ladies and gentlemen. The structure is surmounted by a clock tower, in which there are both a new clock and bells. The exhibition swimming-bath is 110ft. long and 35ft. wide. There is a balcony running round the whole of this bath, giving room for 600 spectators. On the ground floor there is a range of 66 dressing-boxes, and in addition there are two large dressing-rooms, which can be used for the convenience of competitors at sports. The small swimming bath is 70ft. long and 30ft. wide, having 44 dressing-boxes. This bath is set apart on certain days for ladies—there being a separate entrance from the ladies' entrance hall. Both the baths are lined with white glazed bricks, while the walls inside the building have dadoes of white and coloured glazed bricks. The coping round the exhibition bath is one of St. Ann's marble, and the gangway in front of the dressing-boxes is laid with a mosaic flooring. There are 10 first and 10 second-class private baths for gentlemen, and four first and six second-class private baths for ladies, with suitable waiting-rooms for each class of baths. The bathrooms are built of white and coloured glazed bricks. Electric bells are fitted to each bath, and the whole of the building is lighted by electricity, which is supplied from the corporation electric lighting station. The old first-class swimming bath has been thoroughly renovated, and will be used as a boys' bath. The estimated cost is £15,500, and the contractor was Mr. F. Messom.

**STAFFORD.**—The Baptists of Stafford have erected a new chapel there. The buildings have cost £4,000. The style is described by the architect, Mr. Ewen Harper, of Colmore-row, Birmingham, as Tudor-Gothic. The chapel accommodates about 420 persons; the schools are ample in floor and air space, and are up-to-date in the matter of classrooms; and there is a small lecture hall or church parlour. The chapel includes a nave, lean-to aisles, a clerestory, an apse

(in which is a baptistery lined with white marble), an organ chamber, and a gallery across the entrance end of the building. The windows are filled with tinted glass, and the electric light has been installed. Vestries for the minister and the deacons, tea-kitchen, storeroom, and lavatories are also provided. The works have been satisfactorily carried out by Mr. G. H. Marshall, builder, of Smethwick, under the superintendence of Mr. Harper. The exterior of the buildings is of brick, with stone dressings.

**ST. PETER'S, MEAVY.**—The parish churchyard is celebrated far and away for its famous old oak tree growing near the lych gate, and measuring fully 25ft. in circumference. It is said to date from the days of the Normans, and, although the lower branches are still bright with foliage, the trunk is so hollowed that it may be walked through. A beautiful addition has just been made to the sanctuary in the shape of a new altar of carved and sculptured English oak, the slab being a monolith of moulded and polished veined English alabaster, upon which the five consecration crosses are incised and gilded. In the central panel is carved, in high relief, the banded figure of our Lord bearing the cross, the *motif* for which is the well-known picture in Magdalen College, Oxford. This addition is the handiwork of Messrs. Harry Hems and Sons, of Exeter.

### ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

**DEVON ARCHITECTURAL SOCIETY.**—The Devon and Exeter Architectural Society made an excursion to Totnes on Saturday. The first place visited was Totnes Castle, of which little more than the shell of the keep remains. It is circular in plan on a conical mound. This was the seat of the powerful Judhael de Totnaïs, one of the followers of William the Conqueror, who was rewarded with several manors in Devonshire. The parish church was part of St. Mary's Priory attached to the Benedictine Abbey at Angers, and this priory, if not founded, was at least endowed by Judhael de Totnaïs. The church appears to have been rebuilt in 1259, when it was consecrated by Bishop Branescombe. Another rebuilding was going on during the episcopate of Bishop Lacy, who used an easier method of raising the necessary funds for the present structure than modern bazars, for he granted a 40 days' indulgence to contributors, the prior of Stoke giving £10 to the tower in 1418. Internally the most interesting features are the handsome screens, for although this country is unusually rich in carved woodwork a stone screen is very rare, and here not only the rood and parclose screens are of stone, but the staircase turret to the former is of carved stone, projecting into the chancel on the north side, with elaborately-worked canopies (renewed) and bases for statuary. The screens appear to have been erected about 1460 by the corporation, so that it might have a stone division between nave and chancel, as in Exeter Cathedral. The Guildhall is part of the remains of St. Mary's Priory, and contains some carved oak, the old stocks, and a wooden waterpipe. Driving to Compton Castle, Marlton Church was visited, with its monuments to the Gilberts and others associated with the castle, which latter is an exceedingly interesting building of 15th-century date. Next visited was Berry Pomeroy Castle, which, although perhaps the most extensive ruin in the county, is more interesting from a picturesque than an architectural standpoint. Leaving the Castle, Berry parish church of St. Mary was inspected. Built in the 15th century, it has a very fine rood-screen, with painting still covering the lower panels, although the heads have been defaced. On the capital of the south arcade of nave, scrolls are carved, bearing the names of several persons who contributed to the building. The handsome altar tomb, in north wall of chancel, is ascribed to Sir Richard Pomeroy early in the 16th century. In the north aisle is the 17th-century Seymour monument, with some very quaint figures. This finished one of the most interesting excursions the society has made for some time.

**EDINBURGH ARCHITECTS AT ST. ANDREW'S.**—The annual excursion of the Edinburgh Architectural Association took place on Saturday last to St. Andrew's. Leaving the Waverley Station at 9.35, they reached the old ecclesiastical capital of Scotland about half-past eleven o'clock, and proceeded to the Alexandra Hotel, where lunch was served. Afterwards, under the leadership of Mr. Hay Fleming, St. Andrew's, they inspected

the West Port and the burghal relics in the council chamber. Next they were shown the parish church, St. Mary's College, and the University library. Mr. Hay Fleming having again taken up the leadership, they examined St. Leonard's Chapel, the principal entrance to the Priory, and the gateway of Novum Hospitium, the last mentioned said to date from the first half of the 16th century, and to have been twice rebuilt. At the Priory, the next object of interest, Mr. John Kinross, A.R.S.A., pointed out the result of the excavations and restoration, so far as they have gone. It was described as founded about 1144 for Augustinian canons. Among other buildings visited were the Cathedral, the Abbey Wall, with its towers and canopied niches; the Kirk Hill, with the foundations of St. Mary's Church; the Castle, or Episcopal Palace, dating originally from the 13th century; the Museum; and St. Salvador's Chapel and Tower.

**ROYAL INSTITUTE OF BRITISH ARCHITECTS.**—At the 16th ordinary meeting of the session of the Royal Institute of British Architects, held on Monday, the gold medal annually given by her Majesty the Queen was presented to Mr. Ernest George. The new president, Professor Aitchison, having been inducted into the chair, proceeded to present the medal to Mr. George, and in doing so reminded them all of the gracious interest the Queen took in the fine art they cultivated and professed. Mr. George's work had been almost wholly domestic. He had been engaged on no public buildings, and his church work had been confined to a few small churches, two of them in the Engadine. He had been a most diligent etcher and water-colour artist, and had illustrated his travels and studies in France, Belgium, and Italy. It was not, therefore, to be wondered at that so many of his executed works had a quaint flavour of French, Flemish, and Italian work as well as English. He had been looked upon as one who had been most instrumental in helping modern London to become one of the most picturesque cities in the world. Mr. George, having received the medal, briefly returned thanks. At the close of the meeting an opportunity was afforded for inspecting an interesting collection of architectural drawings, some of which were executed by the gold medallist.

### PARLIAMENTARY NOTES.

**RESPONSIBILITY FOR DRAINS.**—The Standing Committee of the House of Peers on Tuesday considered the Bill, introduced by Earl Beauchamp on behalf of the Association of Municipal Corporations, to amend the Public Health Acts with respect to sewers and drains. Lord Herschell presided. Earl Beauchamp explained that the principle of the measure was that drains on private land should be kept in order by the owners. Lord Harris, on behalf of the Local Government Board, objected that the Bill would make landlords retrospectively responsible for drains hitherto repaired by the local authorities. The Earl of Morley, agreeing with Lord Harris, contended that the measure should be purely prospective, except where drains had been joined to public sewers without due notice to the local authority. The Earl of Kimberley thought some change in the law necessary, but urged caution, when it was proposed to place on the owners the responsibility for drains hitherto looked after by local authorities. The chairman remarked that at present if the drains from a row of houses had several owners, they were taken care of by the owners; but if they were the property of a single person, the local authority repaired them. He could see no reason for that preference. He understood that the Bill would in all cases throw responsibility on the proprietor. (Lord Beauchamp nodded assent.) Amendments embodying the objections of Lords Harris and Morley having been agreed to, the Bill was ordered to be reported to the House.

The condition of the river at Cambridge will soon be improved, as the town is being sewered on the "separate" system, and in future rain water only will be carried to the river. The governing bodies of Trinity College and Trinity Hall have instructed Mr. Chas. E. Gritton, A.M.I.C.E., M.S.A., of Westminster and Selhurst, to prepare plans and reports for draining those colleges and to obtain tenders for the works.

The old buildings in Fetter-lane by West Harding-street, on the east side, which have for many years been going through a process of natural decay, will not be long before they are razed to the ground. The back walls of Nos. 24 and 25 fell in on Tuesday afternoon, when it was considered necessary to stop vehicular traffic, and only allow pedestrians to pass on the side next to the Record Office.



## CAST IRON IN BUILDER'S AND CONTRACTOR'S WORK.—XXVIII.

By JOSEPH HORNER.

IT is a little curious that, in spite of the application of numerous experiments and of mathematically correct theories to the problem of the strengths of cast beams and columns, there yet exist no uniform and universally accepted rules and formulæ for the calculation of those strengths. Since the same fact meets us in relation to other branches of engineering practice we need not be greatly surprised, but must be content to take things as they are. Many of these discrepancies in the case of cast-iron beams and columns, probably most of them, result from the great variations due to the uncertain practical conditions which I have endeavoured to illustrate and explain in the early portion of this series. But the consequence is that the man who attempts to design without previous experience is confronted with perplexities as to the selection of formulæ suitable for his work, formulæ deduced, moreover, from experimental data, and he has to get over the difficulty by "lumping the metal"; in other words, giving the most ample margin of

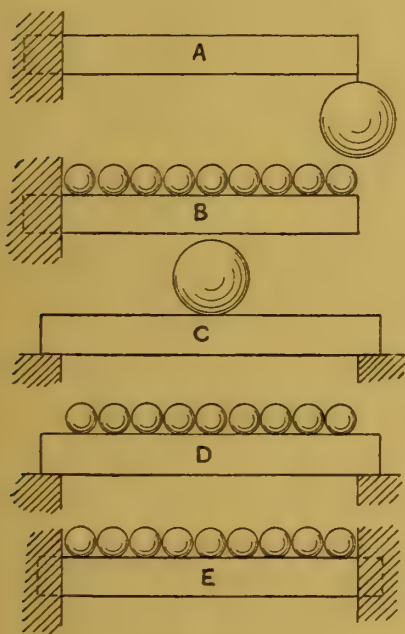


FIG. 115.

safety, varying in amounts from 5 to 10. Under these circumstances, I propose to consider first the theoretical aspects of the problem, and afterwards note some of the principal formulæ and methods of estimating strengths in common use.

There are two methods in general use for calculating the strength of beams. One is based upon the results obtained by testing miniature beams or test-bars, the results being taken as a standard ratio for larger beams. The other method, although depending upon the test-bar for data, is essentially a thoroughly scientific one, based upon the accurate estimation of the resistance of a beam to bending actions. We will consider the former method first.

It has been stated in Art. III., p. 329, that the ratio of one beam to another is represented by the formulæ  $\frac{BD^2}{L}$ ; that is, if we increase or

decrease the breadth B of a given beam, we increase or decrease its strength in a like ratio. If we vary the depth D we vary the strength in direct proportion to the squares of the respective depths. If we alter the length L of the beam we alter its carrying power in an inverse proportion. For example, if we take any beam, and double or treble its breadth, B, we double or treble its strength; but if we double its depth, D, we make it four times stronger; if we treble its depth we make it nine times stronger. But if we double or treble its length it will be but a half in the first case, or one-third of its former strength in the latter case. Therefore, if we know by testing any bar at what load it will break, and then find what proportion or ratio exists between that load and the  $\frac{BD^2}{L}$  of the bar, we have a constant that will hold good for

all bars or beams of the same material, and under the same conditions of loading and support. Taking, for example, an average test-bar, of a section of 2in. in depth by 1in. in breadth, and 3ft. between supports, such a bar loaded in the centre should fracture under a load of about 30cwt. = 3,360lb. Add to this half the weight of the beam, which it would have to carry in addition to the external loading—nearly 10lb.—we then get a total of = 3,370lb. Now, the  $\frac{BD^2}{L}$

of the bar =  $\frac{1 \times 2 \times 2}{3ft.} = 1.33$ ; therefore the

ratio of  $\frac{BD^2}{L}$  to the breaking load is as 1.33 is to 3,370 = 2,526 constant.

This number holds good for a test-bar; but it is too high for ordinary purposes, because a small casting is always stronger than a large one made of similar metal; 2,000 is the usual constant for beams of average metal: this means a breaking load on the test-bar of about 23cwt.

But this constant only applies to beams supported and loaded as the test-bar is—i.e., supported at both ends, and loaded in the centre. The relative strengths of beams under different conditions of loading and support are as follows (Fig. 115):—

	Relative strength.
(A) When supported at one end, and loaded at the other.....	1
(B) When supported at one end, and the load distributed.....	2
(C) When supported at both ends, and loaded in the centre (test-bar).....	4
(D) When supported at both ends, and the load distributed.....	8
(E) When fixed at both ends, and the load distributed.....	12

Therefore, when dealing with various beams, we must modify the constant 2,000 to suit our conditions. Thus, for case A, the new constant becomes  $\frac{2,000}{4} = 500$ ; for case B it becomes  $\frac{2,000}{2} = 1,000$ ; for case D it becomes  $\frac{2,000}{2} = 1,000$ ; for case E it becomes  $\frac{2,000}{2} = 1,000$ ; for case C it becomes  $\frac{2,000}{1} = 2,000$ . But these figures only stand for rectangular beams. A beam of H section can be calculated thus:—Take first the strength of a beam represented by the over-all dimensions, then

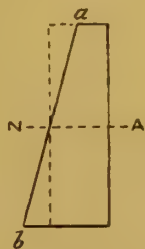


FIG. 118.

subtract from this the strength of the side recesses; the resultant will be approximately the strength of the beam of H section. Other sections can be treated in a like manner.

Coming now to the second method, suppose, instead of taking a cast-iron beam, an experimental one were made with a bar of a soft substance of a small section, such as indiarubber or soft timber. Supporting this at both ends and loading it in the centre, we observe that it bends very considerably before it finally gives way, and in so bending the upper side of the beam is perceptibly shortened, and the under side is perceptibly lengthened. This will be rendered more apparent if we mark a series of lines depthwise on the beam parallel to each other, and at right

FIG. 116.

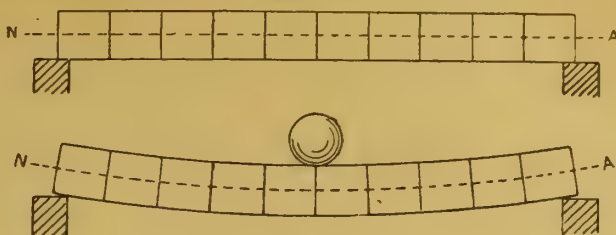


FIG. 117.

angles to the length of the beam (Fig. 116). Loading the beam (Fig. 117), we note that the lines are no longer parallel. On the upper surface of the beam they are closer together than they were previous to loading, and on the lower surface they are farther apart. But we observe that they are still straight, and also that on a line drawn through the centre of the beam N—A the lines are of exactly the same distance apart as they were on the beam when straight. This line N—A is termed the neutral axis of the beam, and on this line there is no bending action. Now what is true of this beam of indiarubber or timber is also true of a cast-iron beam. But since cast iron is not so elastic a substance as timber, these effects would scarcely be observable on it. This alteration of form in the beam, involving the closing of the lines on the upper surface, is due to compression of the fibres of the material, and the elongation of the lines on the lower surface is due to the extension of the fibres there. In fact,

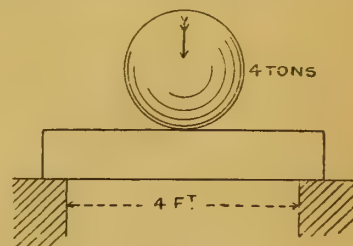


FIG. 119.

an exaggerated view of the action of the load on the fibres would be that represented in Fig. 118. Here an original line drawn is indicated by the dotted vertical; the altered line due to the loading is shown angled, a—b. In the upper portion distances measured horizontally between the two lines would represent the compressive forces acting on the fibres, and distances measured similarly on the lower portion would represent the tensile forces; on the centre line or neutral axis N—A no difference can be measured, and, as a consequence, it is not stressed in tension or compression. As a matter of fact, in practice it has its proportion of shearing force to resist, but this can be neglected in most cases, because if a beam is sufficiently strong to resist the forces tending to fracture it by cross breaking, it is strong enough to resist the shearing forces. Fig. 118 shows that the forces of tension and compression are greatest at the outside edges, and gradually diminish as they near the centre. We have here, then, a practical illustration of the theory of the Hodgkinson beam, in which the concentration of metal on the top and bottom of the beam places it just where the heaviest stresses occur, and thus it follows that metal may be safely taken from the centre without weakening the beam in that plane.

Considering further the case of a beam loaded as in the experiment, Fig. 117, before the beam gives way clearly the compressive and tensile forces must be in equilibrium—that is, the thrusting forces acting above the neutral axis must exactly balance the pulling forces acting below it. It has been stated in Article III. that the compressive and tensile strengths of cast iron are far from being identical in amount, and that the neutral axis of a beam does not in consequence lie on the centre of its section, and we must bear this in mind in the calculation of the resistance of beams of that metal to bending actions.

Take now a beam, say 4ft. long and 1ft. deep, supported as in the experiment, Fig. 117, and loaded in the centre with a breaking weight of four tons, Fig. 119. This means that a load of two tons would be imposed upon each support



A A, which, acting at a radius of half the span of the beam = 2ft., would constitute a bending moment of  $2 \times 2 = 4$ ft.-tons on the centre section. This is practically the case of one arm of a lever multiplied by a force applied at the end. Against this the resistance of the beam has to be equated. This resistance may be taken as equivalent to the depth of the beam measured at the centre, multiplied by the load per square inch that the material is capable of sustaining. This, however, is a rough approximation only, because it merely takes into consideration the fibres on the extreme outsides of the beam. Note should be taken of it, for it forms a good check on the more complicated method which follows. If we had an I section beam under consideration instead of a square one, a still nearer approximation to the actual facts of the case could be obtained by taking the area of one flange and multiplying this by the load per square inch that the material is capable of sustaining, and by the distance between the centres of the flanges, then equating this sum against the bending moment.

Returning to the model in Fig. 117, and enlarged view of the alteration in shape due to the load, Fig. 118: Fig. 120 shows the action of the stresses set up in the beam when the load is imposed. We may consider the arrows as representing so many thrusting and pulling forces transmitted by the fibres of the material, and acting in opposition to the bending moment on

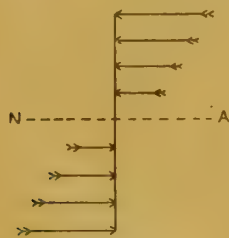


Fig. 120.

the beam. The sum of the thrusting forces in one direction is equal to the sum of the pulling forces in the other direction. The force acting on any little portion of area is proportioned to its distance above or below the neutral axis N—A, and the moment of this force about the neutral axis is proportional to the square of its distance from the neutral axis. Hence, if every little area of a section be multiplied by the square of its distance from the neutral axis and the results added together, we get what is termed the "moment of inertia," or "I" of the section. This quantity, divided by the bending moment on the beam, gives the stress at lin. from the neutral axis, if all dimensions have been taken in inches. Now we have seen that the heaviest stresses occur on the extreme edges of the section, and it is here that the exact amount of stress has to be determined, for if the breaking load of the material is exceeded here, the beam must fail. If the extreme edge of the section be  $x$  inches from the neutral axis, then by dividing I by  $x$  a new quantity is obtained, which is termed the "modulus of the section" or Z. This quantity, divided by the bending moment, gives the stress on the fibres at the extreme edge of the section.

#### A LOFTY STEEL BUILDING.

AT the corner of Broadway and Pine-street, New York, a building has been erected of twenty-one stories in height, or 289ft. 7in. from the Broadway level to the roof. It is the American Surety Building, and its details and construction are described and illustrated in the *Engineering Record* of June 13th. The structure is a steel cage erection, and has the latest equipments for high-class office buildings. The architect was Mr. Bruce Price, whose assistant, Mr. Edward A. Rogers, supervised the erection. The contractors were the Jackson Architectural Iron Works. No less than 3,500 tons of steel were used in its construction, and its total weight is estimated at 26,000 tons. This weight is transmitted directly to the solid rock at a depth of 72ft. by brick piers, which stand on thirteen concrete-filled steel caissons. The supporting area is 3,575sq.ft. The column loads are transmitted to the caissons through brick piers, over the top surface of which the pressure is distributed by cross-grillages of steel I beams. On two sides

the wall-columns are located near the building lines, and to insure uniform loading heavy double and treble-plate girders were set on the grillages. The girders overhang these supports at both ends, the outer one forming a short cantilever carrying the wall columns. The lower sections of the walls are carried on pairs of riveted plate girders well connected to the cantilevers. The other part of the cage framework consists of 10in., 12in., 15in., and 20in. rolled steel I horizontal girders and joists, of riveted Z bar or L iron columns, web-spliced every second story, and braced and stiffened by gusset plates. The section shows alternate panels stiffened by diagonal tension rods which are made adjustable. Other details explain how the cantilever girders rest on the piers. By means of square contact bars these girders take their bearing centrally on the piers. At both ends of girders the columns are placed slightly overhanging and counter-balancing each other. A process block view represents the foundation work in progress after the piers and grillages were completed. These grillages under the columns distribute the concentrated load over the brick piers. Details are given of the columns which form hollow rectangular sections. The external design represents a lofty pierced structure with a high columnar basement, and a corniced attic over. The proportions and treatment are tower-like, with massive rustications at the angles. The plain intermediate stories have simple openings rusticated, the cornices and attic stories being more richly embellished in a florid Italian style.

#### COMPETITIONS.

**PRIZE FOR INDUSTRIAL HYGIENE.**—The council of the Society of Arts are prepared to award, under the terms of the Benjamin Shaw Trust, a gold medal, or a prize of £20. The medal, under the conditions laid down by the testator, is to be given "for any discovery, invention, or newly-devised method for obviating or materially diminishing any risk to life, limb, or health incidental to any industrial occupation, and not previously capable of being so obviated or diminished by any known and practically available means." Intending competitors should send in descriptions of their inventions not later than the 31st December, 1896, to the secretary of the Society of Arts, Adelphi, London, W.C. The judges will be appointed by the council.

**PHILADELPHIA.**—The City of Philadelphia recently offered prizes for the best competitive designs for the decoration of the council chamber in the public building. Thirty-nine designs were sent in, nearly all by American artists of high reputation. The first prize, of 3,000dols., was awarded to Mr. Joseph De Camp; the second prize, of 1,000dols., to Mr. C. Y. Turner; the third to Mr. F. W. Benson, and special mention to Messrs. E. W. D. Hamilton, F. W. Sheefer, and T. Ketterer. Mr. De Camp is very well known throughout the country. Mr. Turner is practised in decorative design, having taken the second prize in the Oyer and Terminer Court-room competition, in New York, while Mr. Benson won recently the Shaw prize at the Exhibition of American Artists in New York.

#### CHIPS.

It has been arranged to erect a memorial to the late Christina Rossetti in Christ Church, Woburn-square, which she attended for nearly 20 years. Sir Edward Burne-Jones has consented to design a series of paintings for the reredos, and it is believed that there are many who will contribute with pleasure to such a memorial.

St. Saviour's Church, Heckmondwike, was consecrated on Thursday week. The building, from designs by Mr. W. S. Barber, of Halifax, is in the Early English Gothic style, and has seating accommodation for 550.

The finished portion of St. Margaret's Memorial Church, Dunfermline, consisting of the nave and aisles, was opened last week. Plans have been prepared by Dr. Rowand Anderson for a building estimated to cost £30,000. Only part of the design has, however, been meantime carried out at a cost of £6,415.

The trustees of the Wesleyan property at Ryhall have decided to renovate the chapel, putting in a new floor, new windows, and a new entrance, and, further, to erect two classrooms and a schoolroom at the back of the chapel on land already belonging to the trustees. The size of the new schoolroom is to be 26ft. by 20ft. The cost is estimated at £280.

## Correspondence.

### A NATIONAL UNION OF ARCHITECTS' ASSISTANTS.

To the Editor of the BUILDING NEWS.

SIR,—In these days of organisation—political, social, and otherwise—is it not somewhat remarkable that architects' assistants have no society existing for their common good? That there is room for such is beyond doubt. It would seem to recommend itself in four ways: (1) berths, (2) training, (3) domiciles, (4) insurance.

To take the first, it is highly desirable there should be a central organisation to which assistants could refer for information before taking a berth. A principal makes every investigation, and it is only natural that assistants should wish to do the same. It is also desirable that a board of investigation should exist, to inquire into all cases of wrongful dismissal and unprofessional behaviour.

(2) As regards training. One of the main objects of the association should be the fitting of young architects for berths as assistants, and should forward in every way their technical training and knowledge.

(3) Domiciles. The association could promote the erection of large boarding-houses for the exclusive use of assistants. For general use, reading-rooms, studies, library, gymnasium, tennis-courts, &c., could be provided; while each assistant could have one or two rooms as desired, board at a common table, and live far more economically than in "diggings."

(4) Insurance. As a rule, architects' assistants make no provision against accidents, sickness, old age, or death. A national union should be able to encourage this and effect easy premiums.

As this is a subject which must be of interest to many assistants, a discussion would, perhaps, draw attention to what might and should be done to place architectural assistants on a better footing than they have at present.—I am, &c.,

GEORGE H. WIDDOWS.

Oak Villa, Hendon, N.W., June 22.

#### A CAUTION.

SIR,—A few days ago a young man of sufficiently good appearance, who gave his name as "H—," called upon me, and said that a Mr. C— (a name of which I know two or three bearers) had recommended me professionally.

He asked if I would undertake to prepare plans for a new hotel of considerable size at M— (a well-known health resort abroad), and on my assenting, he proceeded to specify some general particulars as to the amount of accommodation required and the style of architecture, &c., and said that his father, who, with him, was staying at the C— Hotel (a large and well-known one near Charing Cross), would provide me with a plan of the site and levels, &c., and any other information I might require, and would also answer my query as to the particular Mr. C— who had recommended me. He left ostensibly to communicate with his father, and said they would both call in the course of an hour or less; but from that time to this I have neither seen nor heard anything of the young man or his father, and on inquiry the following day at the C— Hotel, the information given was that nobody named "H—" was staying there, nor had anyone of that name inquired for rooms.

I am sending this communication to you in order that other architects may be put on their guard against the individual above-mentioned, though I am somewhat at a loss to understand the motive of his visit and his subsequent behaviour. If it were a hoax, it was a very poor one, and if an attempt at imposition, it did not succeed.—I am, &c.,

ARCHITECT.

#### DOMESTIC DRAINAGE.

SIR,—In reply to the letter on the above subject, I may mention that what is known as the "Eclipse" smoke-testing machine will be found to give satisfactory results for drain-testing purposes.

Many of the minor details connected with the fixing of domestic conveniences necessary to insure the highest degree of sanitary efficiency are frequently omitted, chiefly on the ground of expense; but such omissions, unimportant as they seem, will be found to affect, directly or indirectly, the hygienic value of the drainage system. In



sanitary, as in other matters, *thorough efficiency* will in a great measure depend on attention to trifling details.

I am pleased to find that the articles on Drainage have proved useful. They will shortly be published in book form.—I am, &c.,

THE WRITER OF THE "NOTES."

### THE CANNY SCOT.

SIR,—Amongst my letters this morning is one from the Glasgow Institute of Architects, saying it is proposed by that body to hold an exhibition of metal-work in their city in October, and asking contributions of old examples upon loan for exhibition. Further, I read, "The works will be sent at the exhibitor's risk, and the committee and the Institute will not hold themselves responsible for loss or damage of any kind, either in transit or at the exhibition." This cool intimation is signed by half-a-dozen Glasgow architects.

Do the gentlemen in question really think collectors are so anxious to exhibit their precious examples of the relics of old time that they don't mind any amount of personal risk so to do?—I am, &c.,

A SUBSCRIBER TO THE "BUILDING NEWS"  
FOR THIRTY-THREE YEARS.

June 18.

## Intercommunication.

### QUESTIONS.

[11519].—**Gymnasium Floor.**—Will some of your readers kindly inform me what is the material best suited for the floor of a gymnasium, and mode of laying?—L. G. H.

### REPLIES.

[11511].—**Tile Roof.**—Are the tiles pervious or impervious to moisture? Some tiles, though good in colour and shape, take in water when new; but no doubt the tiles are Broseley, and would not be in fault. The cause undoubtedly, I should say, was through the bedding, especially as the usual specification formula has been carried out, "bedded in hair mortar." Why hair mortar? (It is quite easy to go wrong when led by the nose of custom.) The worst that could be used for the purpose. The loose ends of the hair, which usually stick out of the mortar, hang over the tops of the tiles, and act as leaders in carrying the water over. When the bedding is fully charged with moisture, the least wind pressure would set up a kind of siphonic action, and the little loose hairs would continue to drip away quite merrily, on the same principle as a piece of wet flannel hung on the edge of a wash-hand basin, having one end in the water and one outside, would set up a continuous drip till the basin was emptied. Most builders, by the time they have reached the age of a fool (40, according to Young), will have had sufficient experience to cope with the many difficulties of leakage, &c. When tiles are bedded, keep the bedding nearly at the top, about an inch down, and only use sufficient to check the wind, as much mortar holds the wet. Pin-pointing is waste labour. Better spend the money on board and felt. A good bedding mortar is made up of lime, fine clean sand, and a little Portland cement. I am afraid no kind of solution will be effectual; the roof in the course of a year or two will tighten by the action of soot and dirt filling up the crevices and interstices.—H. FASSTON, Lynton.

[11511].—**Tile Roof.**—The fault of roof described by "Enquirer" is the pitch. It should not be less than 45°, or half-span. The lap should be 3in., and the tiles ought to be fairly smooth, and slightly vitrified. If the tiles are of a bright red colour, they are probably absorbent. In good tiling, the tails of each course should fit closely upon the backs of those below. If the tiles are porous, a waterproof solution may be tried, such as Szerelme's liquid.—G. H. G.

[11513].—**Lightning Conductors.**—A number of letters have been appearing lately in the *Yorkshire Post* re lightning conductors, from the pen of a Leeds gentleman, and, if true, I think a great number of us are living under a great mistake in our ideas on the subject. For myself, I always thought conductors were put up to attract the lightning, and convey it safely to earth, and a few years ago I put two on to the most prominent chimneys of my house. (The architect had not provided them, as I think he should have done, as my house stands alone, and in a very prominent position, being a landmark for many miles around.) Now this gentleman of Leeds points out that conductors are not to convey the lightning to earth, but to do quite the opposite, convey something to the lightning, and he says, that if a flash did strike the conductor, it would most certainly fuse it, and do considerable damage. If this is so, I don't see that it matters how the conductor is fastened to the walls. I don't understand the science of the thing at all; but I should like to have it settled one way or the other. Is there anyone who can give us a full explanation of the affair, and show us how conductors should be fixed, and also, which is best—ribbon or round copper? Most, I believe, prefer the first mentioned. Also, is it absolutely necessary to have more than one spike at top of conductor? If conductors are not to attract lightning, then I see no reason why they should be led into drains, soft-water tanks, or have a large square of copper plate at earth end. For I suppose if they merely go into the earth, that would be sufficient to set up conduction between earth and clouds. No doubt many of your readers can tell us what the effects have been in cases of lightning striking buildings provided with conductors, and if you care to insert this letter, perhaps they would give their experience, describing fully

the form of conductor, and the surroundings. I hope, Mr. Editor, you will take this matter up, if there is any reason to do so, and have it thoroughly explained, as it is a very serious affair in my case. I have had a tree within 50 yards of my house struck, and from past experience I have noted that lightning has a nasty habit of striking again near the place it has once visited.—JAMES COOPER, Killerby Hall, Scarborough.

[11513].—**Lightning Conductors.**—Copper tape is probably the best conductor; it should be soft and flexible, so as to follow the outline and profiles of the building. This tape may be let into the walls, and cemented over or concealed where it is accessible. If the conductor be connected to the external metal surfaces, it will be all the safer. Cramps of iron or copper are sufficient for fixing, but the rod should be continuous. Recent researches have shown that a flat iron wire rope is the best for a single conductor, that the conductors should be laid along ridges, and the fastenings should be of gum-metal, screwed or nailed to the building.—G. H. G.

[11515].—**Flooring Boards.**—As the author of the recent work, "Wood: its Use as a Constructive Material" (London: B. T. Batsford) and other allied publications, the origin of which is largely traceable to the columns of this journal, I am, as "H. R." specially alludes to the above volume, asked to reply to his question respecting "flooring boards cut on the quarter." It is an undeniable fact that there are no foreign-prepared deal flooring on our markets in which quartering is attended to; it is all, as "H. R." experiences, "cut haphazard." As to the question, Can proper-cut flooring be bought seasoned and in stock, whether foreign or prepared? I am sorry to admit that a negative answer must be returned. The reason of this, on one hand, is the widespread and, I may say, universal apathy exhibited by those most interested in the practical study of wood, and, on the other, by the all-important consideration of cost. I have clearly shown, on pp. 83 and 84 of my work, "Wood, &c.," how quartered flooring boards can be economically obtained; but although the work has been before the trade two years, I have never heard directly or indirectly of its being adopted. To those, like myself, who have had wood in the family for generations, and whose practical experience extends over half a century, the conviction is strong that there must shortly be an awakening to this and other vital details connected with the important material of construction we designate wood, for the level to which the trade has fallen during the last few years in regard to quality is disgraceful. I consider the above a true but lamentable admission, in the face of which the question forces itself upon one: Why should the practical study of wood be neglected, and attention alone be given to other materials of construction, such as stone, brick, tiles, slates, glass, iron, steel, lead, and other metals, limes, cements, &c.? Echo answers, "Why?" These latter are the pampered favourites on the stage, the Royal Danes in the play of "Hamlet," whilst "wood" remains the Cinderella in the popular pantomime of that name.—Wm. STEVENSON, the Hull Timber and Sawmill Co., Hull, June 21.

[11516].—**Stone Preservation.**—"Fluate" will instantly arrest the decay, and prevent its further progress. Apply to the Bath Stone Firms, Bath.—B.

[11516].—**Stone Preservation.**—Szerelme's stone liquid is one of the most reliable solutions for protecting stonework, and can easily be applied. The action of this liquid is to fill up the pores of the stone, or to waterproof the particles, so as to prevent the entrance of moisture, and the experience gained by its use of 40 years has shown the value of the invention.—G. H. G.

### CHIPS.

Alterations are being made to St. Nicholas Church, Warwick, embracing the ventilation, which will now be carried out on the Boyle system.

In the ventilation of the new additions to the Royal Lunatic Asylum, Aberdeen (Messrs. Smith and Kelly, architects), the "Climax" patent direct-acting invisible roof ventilators are being used, and have been supplied by Messrs. Cousland and Mackay, ventilating engineers, Glasgow, the sole manufacturers of these ventilators.

The Guild and School of Handicraft are bringing out in the present week a monograph, by Mr. C. R. Ashbee, on the Trinity Hospital in Mile End, E. The book is richly illustrated with lithographs, architectural and line drawings, and a complete set of plans of the Wren portion of the buildings.

Her Majesty's Secretary of State for Foreign Affairs has received from the Acting British Consul at Nice a copy of a notice inviting tenders for certain works connected with the drainage and roads of that town. The adjudication of tenders will take place on Thursday, July 2. The notice, which contains further particulars, may be seen on application to the Commercial Department, Foreign Office, between the hours of 11 and 6.

The Cardiff new free Library is to be opened tomorrow by the Prince of Wales. The architect is Mr. Edwin Seward, F.R.I.B.A. and R.C.A., of Cardiff. The contractors are Messrs. E. Turner and Sons, also of Cardiff. The stone used throughout the building is Corsham Down stone, from the quarries of the Bath Stone Firms, Limited.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied a further number of their patent Manchester grates to the Willerby Asylum extensions, near Hull. All the patent Manchester grates supplied to this asylum, as well as the inlet panels, are fitted with Shorland's patent locking arrangement, with loose key, so that none of the warm-air grids or ventilating panels can be opened or closed except by the attendants in possession of the key.

## Legal.

### BENEFICIAL OCCUPATION.

THE London Exhibitions Company have at Earl's Court large grounds, which, in the season, are fully used; but during the rest of the year lie almost idle. The point was recently raised whether they can be properly made to pay rates for this period. The total rates amounted to £1,791 odd for the year ending March, 1896, and it appeared that after the Empire of India Exhibition was closed in 1895, the ground remained unoccupied. The company paid the rates for the time specified, and also something for a small portion of the place that was used by them; but, as to the rest, they raised the question that there had been no occupation, and on this head the magistrates had declined to issue a distress warrant. The overseer thereupon moved a Divisional Court for a *mandamus*, which was granted (*Times*, June 12) after arguments.

The judges laid it down as being quite clear that the company had been throughout the year in beneficial occupation of the whole of the land. It could not be said for a moment that the company had abandoned occupation for six months of the year. Land of this kind could not be left to itself, and the company could use it at any time; as a matter of fact, they did not use it for exhibition purposes from October to March, but they still remained its occupiers, and so liable for the rates. The magistrates had no power to go into the question of occupation or of the assessment. Their duty was entirely ministerial, and they had only to issue the distress warrant for non-payment. It was true that the fact of the ground being only used profitably for half the year was a very important point in assessing its ratable value; but that was a question for the Assessment Committee, and the company could, and should, have appealed from their decision. The magistrates appear to have confused actual and beneficial occupation. The magistrates were wrong, and so the *mandamus* was granted. In truth, the only way to get rates reduced is to appeal from the assessment within the proper time and in the legal manner; there is no other course possible.

FRED. WETHERFIELD, Solicitor.

1, Gresham Buildings, Guildhall, E.C.

NOTE.—All questions for reply in this column must be headed "BUILDING NEWS," and must reach my offices, as above, by *Tuesday* morning to insure answer same week.

J. K. S.—GUTTER.—WALL.—BOUNDARY.—There would be no trespass in arranging your gutter as suggested. The wall would be presumed to be his line of boundary, unless some other were given in the deeds.

R. L. J.—HOUSE.—BUILDING.—GARDEN.—The owner of land is not generally bound to build up to the line of frontage, though he must not go beyond it. He could have land in front for a garden, if he so desired.

### LEGAL INTELLIGENCE.

THE RESPONSIBILITIES OF LONDON VESTRIES.—A case of great importance to the London sanitary authorities was decided by Judge Emden at Lambeth County Court last week. It was an action by Mr. Ferdinand A. Klett, of Grove-park, S.E., against the Vestry of Camberwell to recover the amount paid by him in carrying out, on the instructions of the vestry, certain works to a sewer. Mr. Lushington was counsel for the plaintiff; and Mr. Macmorran, Q.C., for the vestry. From the statement of Mr. Lushington it appeared that the houses were erected in 1889, and the plans of the drainage were duly approved by the surveyor to the vestry. In January of the present year a notice was served upon the plaintiff by the sanitary inspector calling upon plaintiff to effect certain repairs in the drain, this notice being served under section 3 of the Public Health (London) Act, 1891. In carrying out the work the builder discovered that the drain was used for the drainage of the adjoining house, and was consequently a sewer within the meaning of the Act. The vestry was thus legally responsible to keep it in repair. The work was completed, and the plaintiff now claimed to be refunded the amount spent. The learned counsel cited the case of "Florence v. the Vestry of Paddington" as being on all-fours with that now before the Court; but even were he not entitled to recover under this head, he would submit as an alternative claim that the plaintiff was entitled to damages against the vestry for breach of their statutory duties. Mr. Macmorran, Q.C., admitted all the facts as stated, and that, moreover, the drain was legally a sewer. On the main point, whether the notice given by the



sanitary inspector was in fact a "request" to do the work, he would admit that the work was done in consequence of the duty having been cast upon the plaintiff by the vestry; but while Mr. Justice Chitty's judgment in the case of "Florence v. the Vestry of Paddington" was still undistinguishable from that now before his Honour, yet it did not appear conclusively that his Lordship was setting up his judgment adversely to that given previously in the case of "The Holborn Board of Guardians v. the Shoreditch Vestry." Judge Emden said the case was one of very great importance, and no doubt one that would arise very frequently in years to come. The whole difficulty arose from the manner in which the plans were approved. As they appeared upon the records of the vestry, there was nothing to show exactly what the approval of the surveyor was given to. In order that the plaintiff might succeed it must be shown that there was an express request or implied request from the vestry, or, in the alternative, that the plaintiff suffered damage through the neglect of the vestry to carry out their official and public duties. At first sight the case of "Florence v. the Vestry of Paddington" seemed to cover the ground of the action; but, unfortunately, the reasons upon which that judgment was based were not given. Therefore, he was left to decide this extremely nice point without any assistance from the case except that the decision was given. It seemed to him impossible to construe the notice given by the defendant vestry into a request. It was a mere intimation by an officer. Nor was there a request subsequently such as would entitle plaintiff to recover. As regarded the alternative claim for damages for neglect of statutory duty, the circumstances in the present case were distinguishable from those in "The Holborn Board of Guardians v. the Shoreditch Vestry," in which the defendant body purposely neglected to perform their statutory duties. Looking at what occurred when the plans were brought before the vestry in 1889, he could not discover any evidence upon which a Court of justice could act that there was any negligence on the part of the defendant body; and, as the matter had been placed before him, he had come to the conclusion that there must be judgment for the defendant vestry. On the application of Mr. Lushington, Judge Emden gave leave to appeal.

**ACTION BY A PLYMOUTH ARCHITECT.**—Edward Coath Adams, architect, Plymouth, at Plymouth County Court last week, claimed from Reed, Blight, and Co., contractors, £50 for work done. Mr. T. W. Martyn for the plaintiff; Mr. P. T. Pearce for the defendants. Early in 1893 plaintiff's mother was arranging to build Penhenvilla on the Hoe field, Plymouth, and defendants contemplated erecting a large hotel on the same estate. Defendants were anxious to secure the contract for the villa without tendering, and plaintiff was desirous of becoming the architect of the hotel. Ultimately an agreement was signed, under which defendants, in consideration of their receiving the contract to erect Penhenvilla for Mrs. Adams, agreed to employ the plaintiff as architect for the proposed hotel at 5 per cent. commission. If anything arose to prevent their building the hotel, they would pay him not less than £50 for approved preliminary sketches. Plaintiff furnished preliminary sketches of an hotel in April, 1893, and no fault had been found with them. The hotel, however, had not been built, and plaintiff now sought to recover £50 for the work done. In cross-examination, he admitted the sketches were supplied before the agreement was signed, and that his ordinary fee would be fifteen guineas. It was because Messrs. Reed and Blight were given the contract for the villa without competition that he was to receive £50 for the sketches. For the defence, Mr. Pearce submitted the sketches had not been approved. His Honour held there was no defence, and awarded plaintiff the full amount claimed with costs.

**THE INCANDESCENT GAS LIGHT.**—THE INCANDESCENT GAS LIGHT COMPANY, LIMITED, v. THE DE MARE INCANDESCENT GAS LIGHT SYSTEM, LIMITED, AND OTHERS.—These were actions brought by the plaintiffs for injunctions restraining the defendants from infringing certain letters patent granted to Dr. Carl Auer von Welsbach in 1885 for the manufacture of a cap or mantle of a fabric which was steeped in a solution of some soluble salt, and then burned, producing a coherent skeleton of refractory oxides, which stood the fiercest temperature, and gave out light by incandescence. The plaintiffs alleged that the defendants had infringed their patent. The defendants denied this, and contended that the specification had been anticipated. The case was tried before Mr. Justice Wills, who held that the plaintiff's patent was valid, and granted the injunction asked for. The defendants appealed on Wednesday. On the conclusion of the arguments, the Court held that the decision of the learned judge was right, and dismissed the appeal with costs.

**RE DAVID EDWARDS, BUILDER, BARNT GREEN.**—Adjourned public examination. Liabilities, £2,535; assets, £9; deficiency, £2,526. Examined by the Official Receiver (Mr. L. J. Sharp), the bankrupt said he engaged in building undertakings at Drayton

Green Park, London, and also at King's Heath and Bromsgrove. They all turned out unsuccessful, and being suddenly subjected to pressure by one of the firms that were supplying him with materials he was unable to meet his obligations. This climax was brought about by another firm, who had endeavoured to induce him to give them the contract for the joinery, but with whom he was unable to place the order. They represented that he had taken the Bromsgrove job at such a low figure that he would not be able to carry it out, and thereupon he was served with a writ. Negotiations were in progress for payment of a composition of 2s. 6d. in the pound when he was made bankrupt by a man named Wain. Bankrupt had never had any business relations with Wain, but the latter, for some reason which he could not explain, became the assignee of one of his debts, and so placed himself in a position to force the bankruptcy proceedings. The examination was closed.

#### WATER SUPPLY AND SANITARY MATTERS.

**HOYLAKES.**—At the Public Offices, Hoylake, last week, Mr. Rienzi Walton, M.Inst.C.E., one of her Majesty's Local Government Board inspectors, held an inquiry respecting an application by the Hoylake and West Kirby District Council for sanction to borrow £4,000 for the completion of their offices and building, £1,500 for sewerage works, and £294 for works of private street improvement in Alderley-road, Hoylake. Mr. Roderick Williams, law clerk to the council, conducted the application, and the borrowing of the £4,000 was opposed by the West Kirby Ratepayers' Association, for whom Mr. W. E. Rigby appeared. It was stated that the present offices afforded very scant accommodation, and according to the terms of Lord Stanley's lease the offices were to be completed by the year 1900. The construction of a public hall included in the plans would entail an expenditure of about £700; but this was expected to yield a revenue of about £160 per annum, as at present there was no hall in Hoylake available for general purposes.

#### CHIPS.

We regret to announce the death of Mr. Samuel Chafen, who has carried on business in Rotherhithe for many years as a builder and contractor. The deceased served as a vestryman, and was highly respected in the district.

The new Baptist chapel at Eastleigh, built to accommodate 250 worshippers by Mr. H. S. Rowland, of Southampton, from the designs of Messrs. Lawson and Donkin, of Bournemouth, was formally opened on Wednesday week.

The monument erected in the Howard Park, Kilmarnock, in memory of the late Dr. Marshall, was unveiled on Saturday last. The monument, which rises to a height of 33ft., is built of Giffnock stone, with ornamental columns and carved capital, which forms the pediment of a white marble figure, 6ft. high, representing the Goddess of Health.

The annual general meeting of the London and Provincial Builders' Foremen's Association, for the election of officers and other business, will be held at the Memorial Hall, Farringdon-street, E.C., to-morrow, June 27, at 7.30 p.m.

The newly-completed dry dock at Messrs. Furness, Withy, and Co.'s Middleton shipyard, West Hartlepool, was opened on Saturday last. On its western side there is an engine-repairing shop, 400ft. long, and at the dock-head a Goliath crane, 80ft. high, and capable of lifting as many tons, one man only being required for its manipulation, the entire motive-power of the yard being generated by electricity.

The Cowbridge (Glamorgan) Town Council have decided to call in the services of Mr. H. Bertram Nichols, C.E., of Grosvenor Chambers, Birmingham, in connection with the scheme of water supply.

A new drill hall is being erected at St. Alban's for the St. Alban's Corps. The cost is £1,500. Messrs. C. Miskin and Sons are the contractors.

The Hammersmith and West Kensington Synagogue at Brook Green has just been enlarged, and was reconsecrated last Sunday. Enlarged by Messrs. Chamberlen Bros. from the designs of Mr. Delissa Joseph, the synagogue will now seat 400 persons; it formerly accommodated 200. The cost of the alterations is £2,000.

New kennels, huntsmen's houses, &c., are now being built for the Master of the Monmouthshire Hounds, near Chepstow. Mr. Jas. Linton, of Newport, is the builder, and the architect is Mr. E. Guy Dawber, of London.

New boys' schools are being erected for the Stow and Maugersberg School Board, at Stow-on-the-Wold, Gloucestershire, from the designs of Mr. E. Guy Dawber, of London; Mr. Mark Hookham is the builder.

#### Our Office Table.

THE Prince of Wales presided on Monday afternoon, at Marlborough House, at a meeting of a committee of Royal Academicians and others formed for the purpose of promoting a scheme to establish some permanent memorial of the late President of the Royal Academy. It was moved by Lord Brownlow, seconded by Lord Wharncliffe, and unanimously resolved: "That a memorial of the late Lord Leighton, of Shelton, President of the Royal Academy, be erected in St. Paul's, and that a subscription be opened to further that object." It was also agreed: "That Mr. Val Prinsep and Mr. S. Pepys Cockerell be appointed joint honorary secretaries, and that Lord Hillingdon, as treasurer, be empowered to receive subscriptions.

In the report (for the past year) of the London Mansion House Council on the dwellings of the poor, various recommendations are made in regard to defects in the sanitary laws. "In spite of the increased attention of the local authorities to sanitary work and the greater number of inspectors employed," the report states, "the fact that we have been able to call the attention of the various bodies to thousands of definite cases of insanitation proves that there is still a real need for the continuance of the Mansion House Council. . . . By the courtesy of Lord Rowton, we learn that the indefatigable chairman of the Guinness Trust has been able to work the fund to a large profit, both in London and Dublin. Additional buildings have been completed during the past year, and by steady application and perseverance the trustees have now provided in London 1,877 separate dwellings, containing 3,738 rooms, besides laundries, club-rooms, costers'-sheds, &c., and are negotiating for an additional site. In addition to this, Lord Rowton has, on his own account, been able to open another lodging-house, which is already full every night, as also is the previous one. A third is in course of construction. The first one, close to Vauxhall Station, contains 484 beds; the second, in King's Cross-road, 676 beds; and the one now building at Newington Butts will contain 800.

The first annual meeting of the London and District Branch of the National Association of Master Plumbers of Great Britain and Ireland will be held at the Albion Hotel, Ludgate-circus, E.C., June 30th, 1896, at 3 p.m. sharp. Notwithstanding the short time this association has been formed (the first annual meeting only being held at Nottingham this month) the membership is already 700, and proves the universal feeling amongst *bona fide* master plumbers throughout the country of the necessity of combination and the importance of the objects in view, viz.:—To protect trade interests (both for operatives and masters), so that plumbers' work shall be done by plumbers only. To raise the status generally of the trade throughout the United Kingdom. To the being better able to meet together with a view of mutual support and assistance in all questions of trade difficulties. To enable members to avoid unprofitable competition with each other, so that honest prices and profit shall be obtained for honest work. To prevent, as far as possible, merchants supplying goods to private customers at wholesale net prices. At the annual meeting the executive will report the result of the conference with the operatives, and the officers will be elected for the ensuing year. All the officers of this branch act in an honorary capacity. The secretary is Mr. D. T. Bostel, sen., of 73, Ebury-street, S.W.

THE Watch Committee of the Liverpool Corporation have granted permission to a London syndicate to construct, experimentally, three columns by means of which, connected with the gas-lamps in the streets, it is proposed to supply the public with hot water on the penny-in-the-slot principle. During the hours of street-lighting, water is heated by means of a coil of metal pipe with the flame of the gas. An annular tank is also fixed above the flame, and provides a store of warm water ready to be transferred through the hot coil. In the daytime, when the street lamps are not lighted, only a small flash-light is continuously maintained in the lamp. It is proposed to supply the hot water at a halfpenny per gallon, and when the coin is put into the slot in the daytime the flash-light is turned on full force for a sufficiently long period to heat one gallon of water, which is dis-



charged from a cock at the base of the column. The water can be instantaneously heated in these columns up to 194° Fahr. It would, however, require to be at boiling point—namely, 212° Fahr., before it could be used for brewing tea and such-like purposes.

THE Central London Railway, which is to commence at Shepherd's Bush and terminate at Liverpool-street, is about to be commenced. The stations at various points, starting with that at Uxbridge-road, are in course of construction. The line will be 6½ miles in length, and will be in two separate tunnels. Accommodation along the route will be provided by 14 stations. The contracts for the work have been let to three parties. Under the open space in front of the Mansion House and Royal Exchange there will be several subways, and the contract for these has been let to Mr. G. Talbot. By this line an important and much-needed communication will be opened up between east and west, which will help to relieve the immense traffic in this direction.

THE members of the District Surveyors' Association and friends dined together on Wednesday, the 17th inst., at the Café Royal, Regent-street, the President, Mr. H. H. Collins, F.R.I.B.A., being in the chair. Amongst the visitors who accepted the hospitality of the association were Dr. Longstaff, L.C.C.; Mr. Payne, chairman of the Building Act Committee, L.C.C.; Mr. Hudson, member of the Tribunal of Appeal; Mr. Thomas Blashill, superintending architect, L.C.C.; Mr. Henry Arthur Hunt, Mr. Andrews, Mr. Goodacre, Mr. Hoole, Mr. M. E. Collins, Mr. A. Collins, and many others. The occasion afforded an opportunity of presenting to the hon. sec., Mr. Benjamin Tabberer, a handsome silver tray, with a suitable inscription engraved thereon, in recognition of his many years' service in that capacity.

SIR AUGUSTUS HARRIS, whose untimely death has deprived the stage of one of its hardest-working and most successful actor-managers, owed his chance in great measure to another successful man, Mr. W. Edgecumbe Rendle, whose well-known system of glazing has been adopted in deserved preference to most others by many of our readers. Sir Augustus Harris afterwards married Miss Rendle, and his brother-in-law is now the head of the well-known firm of W. E. Rendle and Co., of 5, Victoria-street, S.W., and inherits all his father's enterprise and high business character.

AN interesting article on Portland cement in America appears in *The Quarry*, from which it appears that the manufacture of this cement from artificial mixtures of carbonate of lime and clay is increasing to a very large extent. New factories for its manufacture are being erected. The labour question is the difficulty—especially the wet process of mixing, which appears to be out of question in America, where the dry process is being adopted. In this process the materials are separately dried and ground and mixed together as dry powders, but this mixing is found to give unequal results for large works. Shell, marl, and clay are available, and these are in a wet condition, and the semi-wet process is largely followed by charging the materials in a wet state into large iron pans with heavy rolls, and the materials are thus thoroughly mixed, and the plastic material as it issues from the pans is moulded directly into bricks, dried, and burned. It is stated that the semi-wet process is the most economical. The writer also refers to the labour of burning, and the introduction of furnaces of the rotary type heated by gas or oil is destined to make a new departure in the United States. It saves hand labour, has many advantages, and appears to have been successful in Pennsylvania.

It has been found, from a large number of tests of bars of cast iron, from the softest foundry mixture to the strongest car-wheel metal, that within certain limits cast iron is materially strengthened by subjection to shocks of repeated blows. The process of annealing castings increases their strength by releasing cooling strains; but this mode of annealing by shock is found to give equal results. Mr. A. E. Outerbridge, in a paper read before the American Institution of Mining Engineers, showed that repeated shocks produce some rearrangement of molecules in the metal, which, so far from making metals brittle, actually render them stronger. It has been generally supposed that vibration injures cast iron by making it brittle, but these experiments have shown that this supposition cannot be supported. A number of transverse test-bars 1 in. square, 15 in.

long, were thrown into an ordinary "tumbling barrel" with other castings and knocked about for several hours. When the bars were broken upon the transverse testing machine, it was found that their average strength was considerably higher than with similar iron mixtures. The actual gain varied from 10 to 15 per cent. The metal was soft foundry iron. Other bars were subjected to 3,000 taps each with a hand hammer upon one end only of each bar, and all the bars showed a gain in strength equal to those above treated.

DEAN FARRAR appeals for assistance to the fund for carrying out the repair of Canterbury Cathedral. The crypt, "the largest and loveliest in England," has, he tells us, been long neglected and grievously disfigured, the beautiful cloisters are perishing under the ravages of wind and weather, and the Chapter-house is literally in a state of dilapidation. The cost of all that is absolutely necessary is estimated at £20,000, towards which a sum of £10,000 has been raised by private effort, and for the rest, the authorities "rely upon the generosity and patriotism of the English race."

MESSRS. MAXWELL AND TUKE, architects, Manchester, have just commenced operations upon the Rock Point estate, New Brighton, Cheshire, where it is contemplated erecting a tower and entertainment buildings similar to, but much larger than, those at Blackpool. The estate consists of rather over 20 acres of beautifully-wooded, undulating land, and it is proposed to erect a tower and buildings in about the centre of the site, and to devote the remainder of the land to recreation and pleasure grounds, amongst the principal of which will be a quarter-mile cycle track, with running track and full-size football ground, also accommodation for at least 30,000 spectators round the same. There will also be an aquarium, constructed on a novel principle, in an old red sandstone quarry upon the estate; together with large bowling greens, tennis lawns, &c. Cafés, refreshment-rooms, &c., will be provided at various points upon the estate.

THERE has always been controversy as to whether the Norman timbers in Winchester Cathedral nave roof are of oak or chestnut. Men who have worked at the cathedral for many years assert positively that the timbers are chestnut, and the same also in regard to the timbers in the cloisters of William of Wykeham's College. On the other hand, the cathedral authorities have generally held that the timbers are oak, and Milner's story, as to Bishop Walkelin cutting down all the oaks of Hampgate Wood after William the Conqueror had granted permission to take what timber he wanted, is quoted as evidence. The point was of such interest that the Editor of the *Hampshire Observer* ventured to raise it the other day with Mr. Russell, the foreman in charge of the restoration of the nave roof. Mr. J. B. Colson, architectural surveyor to the Dean and Chapter, favoured the chestnut theory; and Alderman Thomas Stopher, the well-known architect, was dubious, even after cutting one of the timbers with a knife, as to whether it was not chestnut. Mr. Russell soon set all doubts at rest. From his private store-room he produced the ends of one of the Norman beams, and he showed beyond all doubt that the timber is good old heart of oak. There was the oak "shingle" as plain as a pikestaff. Other timbers showed the "tanning" or staining of the wood by iron which is regarded as evidence of oak.

"PEGAMOID, LIMITED" is being issued as a company with a capital of £300,000 to work the remarkable processes we noticed a fortnight ago. The capital is divided into 299,000 ordinary, and one thousand deferred shares of a pound each. The present issue is 200,000 ordinary shares. The directorate is a good one, and with ordinary business management there can be little doubt of the success of this undertaking. It is, for many reasons, particularly well worth the notice of architects and builders, as "pegamoid" is certain to figure largely in the decoration and furnishing of most buildings in the very near future.

THE new sea-wall and promenade at Bridlington are nearing completion, and July 27th is the day fixed for the formal opening. The wall when finished will be 1,400 yds. in length. It is built of stone; the facings are of ashlar. About 9 ft. thick at the bottom and 3 ft. wide at the top, the wall is backed with concrete. The height of the structure varies, the highest part being about

22 ft. above the ground. By the side of the wall is a wide promenade, which is to be asphalted. On the north-west side of the promenade are to be rockeries, gardens, and walks, a large concert-hall, 105 ft. long by 60 ft. wide, capable of accommodating about 1,600 people, a refreshment-room 50 ft. by 45 ft., a café 45 ft. by 20 ft., a large bandstand, and a number of tiny shops. From the flat roofs of the concert-hall, the shops, and the refreshment-rooms, there will be a colonnade projecting at various points from 10 ft. to 14 ft. The total length of the shelter afforded in this way will be 420 ft. The cost of the laying out of the Spa-grounds and construction of the sea-wall is estimated at about £40,000.

THE Canadians are turning their attention largely to the question of export duty on pulp-wood. There is little doubt, the *North-Eastern Lumberman* says, that if the present government is retained that the proposed export duty on logs and spruce pulp-wood will be imposed. Canada produces a large percentage of raw material which goes to the aggrandisement and prosperity of the manufacturers of the United States. Not unnaturally the Canadian feels the hardship of seeing pine logs sent by the hundreds of millions from Ontario to centres in Michigan, thus robbing the labourer of his hire in Canada, while assisting the lumber industry of the United States. It is asserted also that Canada is supplying the States with material for their pulp and paper mills to the extent of quite 50 per cent.

THE British Vice-Consul at Spezia, in his new report, devotes an interesting section to an account of the condition of the Carrara marble industry. Last year the production of the quarries was 108,951 tons of ordinary and statuary marble, and 52,360 tons of sawn and worked marble. The different kinds of marble in the market from the Massa-Carrara quarries are statuary or Carrara, properly so-called, Sicilian, veined, dove, and peacock. There are a few coloured quarries, but their product is insignificant. Massa produces some coloured marble. There is a quality of marble, perhaps the most rare, and for some purposes the most beautiful, known as "pavonazzo" or peacock. It has a creamy ground with blood violet or purple markings or veins. Of the Sicilian (biancochiaro), blocks of almost any size can be obtained. It is only a question of transport. Blocks weighing as much as 40 tons have been seen at Carrara. A quarry of red marble has lately been worked near Garfagnana. The main valleys in which the quarries lie are the Ravaccione and Fantiscritti. To reach the Ravaccione a long valley of quarries has to be passed, at one end of which, named Crestola, the finest statuary marble is excavated, while at the other end the commonest "Sicilian" is found. Two explanations are given for naming the ordinary biancochiaro marble "Sicilian." One is that during the French occupation of Italy it was sent to Sicily, and thence to England. The other, that the vessels loading marble afterwards went to Sicily to complete their cargoes with fruit, &c. The number of quarries is estimated at 645, of which about 387 are worked. Of these, about 329 give Sicilian, 27 statuary, 22 veined, 7 dove, and 2 peacock marble. The quarries give work to 4,500 quarrymen, whose wages range from 8s. to 2s. a day.

WE have on more than one occasion drawn attention to Willesden paper as being a first-rate material for underlining slates and tiles. We are glad to know that a considerable number of architects are using it in this way, especially during the last year or two. It was used on the Church House, and we notice is being put under the slates at the new general hospital now in course of erection at Birmingham, boarding in this case being dispensed with. We understand this paper is also being used at St. Catherine's Church, Nottingham; St. Lawrence's Church, Ludlow; the new Gamble Institute, St. Helen's; the Union Workhouse, St. Alban's, and at some parochial schools at Homerton, as well as other smaller works.

A COLLECTION of designs for posters by Mr. L. J. Rhead, an English artist who has furnished the hoardings of New York with many advertisements, was open for private view last week at St. Bride's Institute, Fleet-street. Rather less than sixty in number, the posters are adapted to all purposes. The principal items are intended to further the aims of the newspaper proprietor and the publisher, and two of the designs have been already purchased. The posters



are effective, although certain of them lose somewhat in this respect by the designer's liking for detail. Mr. Rhead is especially happy in his employment of brightly-plumaged birds, which are well calculated to strike the eye at a considerable distance.

The Michigan white cedar shingles have, according to the *North-Western Lumberman*, been found perfect and free from decay on Michigan roofs for 75 years, whereas those from the red cedar of the Pacific coast are not found to be so durable owing to an acid in the wood, which is said to be acted on by water, causing rapid corrosion of the nails which are used to secure the shingles. This rust spreads and causes holes. Air-dried shingles are more durable than those kiln-dried.

## Trade News.

### WAGES MOVEMENTS.

**BUILDING TRADE STRIKE.**—More master builders have conceded the terms put forward by the plasterers on strike for an advance in wages of  $\frac{1}{4}$ d. per hour and a new code of working rules. The secretary of the London district states that of the 3,000 men who struck seven weeks ago, 2,650 have returned at shops where the employers had conceded the demands of the men. The cost of the late strike has been very heavy. It is stated that the carpenters and joiners expended some £25,000. The labourers paid in strike pay over £10,000, while the Plasterers' Society disbursed about £8,000. The bricklayers' funds had been reduced to the tune of £12,000; painters, £2,000; cranedrivers, about £2,500; and in addition about £10,000 has been expended by other societies in "out-of-work pay," their members being locked out in consequence of the strike. Roughly speaking, it is estimated that the dispute cost the unions concerned over £60,000, and, taking the heavy losses of the employers, £150,000, it is said, would barely compensate employers and employed for the month's holiday.

### CHIPS.

The new Salvation Army citadel in Castle-street, Aberdeen, which has been built at a cost of £20,000, was formally opened last Sunday morning. Mr. J. A. Souttar was the architect.

The use of a channelling machine to open trenches in asphalt pavement is being attempted by Wilson and Jackson, contractors, of Chicago.

The medals and diplomas awarded to British exhibitors at Chicago have at length been issued to H.B.M. Ambassador at Washington, and have been transmitted by him to the Foreign Office. Sir Henry Trueman Wood has been requested by the Secretary of State to undertake the duty of distributing them, and this will be done at once. All the exhibitors may expect to receive their medals within about a month from the present date.

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### TENDERS.

\* Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

**BLOOMSBURY.**—For painting and repairs to the casual wards, Macklin-street, for the guardians of St. Giles and Bloomsbury:—

Bartlett and Co., Brixton ... £140 0 0

**BRIGHTON.**—For building new stables, cart-sheds, &c., in Nelson-place, Brighton, for Mr. J. Stevens, jun. Mr. Robt. W. Pollard, 108, Church-street, Brighton, architect:—

Bostel Bros., Brighton ... £249 0 0

Howard, G. " ... 246 10 0

Allfrey, W. " ... 224 15 0

Godley, A., Hurstpierpoint\* ... 222 0 0

\* Accepted.

**BRISTOL.**—For shop-fittings for 47 and 48, Wine-street, Bristol; also blinds, fascias, stall-boardings, &c. Mr. Sydney J. Wilde, Weston-super-Mare, architect:—

Bartlett and Sons ... £574 17 6

Parnall and Sons ... 562 0 0

Ridd, R. F. ... 549 0 0 £170 0 0 = £719 0 0

Ellison, T. E. and Co. 542 10 0 164 0 0 = 706 10 0

Wilkins, R. and Sons\* 528 0 0 166 13 0 = 694 13 0

\* Accepted. All of Bristol.

**CARSHALTON.**—For the erection of a pair of cottages at Carshalton, for Mr. A. T. Chapman. Mr. Robt. M. Chart, F.S.I., M.S.A., Croydon and Mitcham, architect:—

Bacon, H., Thornton Heath (accepted).

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Maddison, W. J. ... £721 0 0

Cocks, J. and H. ... 659 0 0

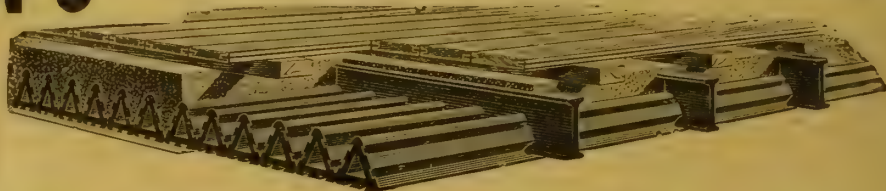
Welsh, T. and Son ... 636 0 0

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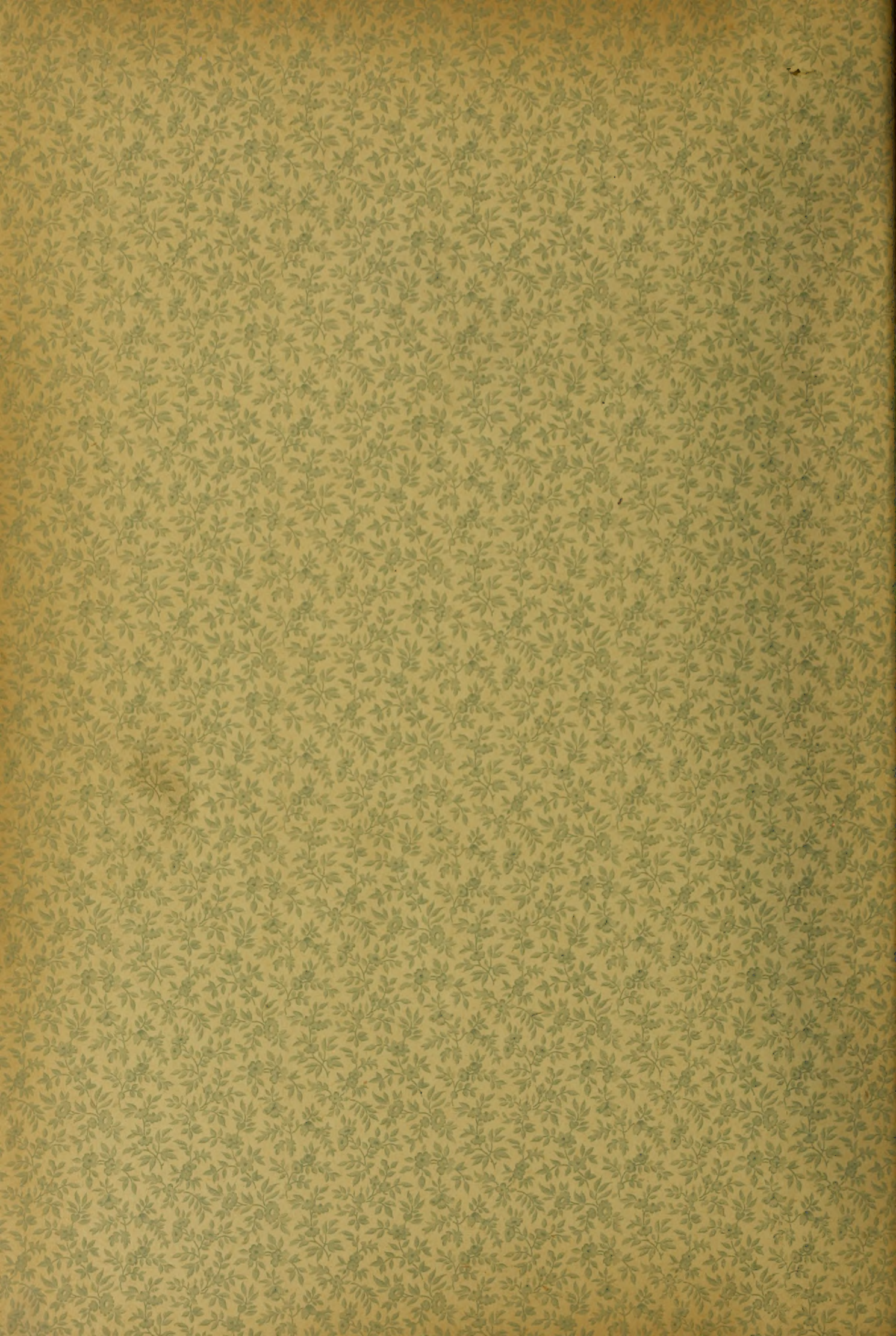


















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